4.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

4.2.1 INTRODUCTION

The Air Quality and Greenhouse Gas Emissions section of the EIR describes the effects of the Lincoln40 Project (proposed project) on local and regional air quality. The section includes a discussion of existing air quality and greenhouse gas (GHG) setting and applicable regulations, estimation of emissions that would be generated during the construction and operational phases of the proposed project, comparison of the project's emissions with relevant thresholds of significance, and identification of impacts and mitigation measures intended to reduce all impacts to the maximum extent feasible. The Air Quality and Greenhouse Gas Emissions section is primarily based on information, guidance, and analysis protocol provided by the Yolo-Solano Air Quality Management District (YSAQMD) per the *Handbook for Assessing and Mitigating Air Quality Impacts*,[1] as well as emissions projections obtained by means of the California Emissions Estimator Model (CalEEMod) version 2016.3.1.[2] In addition, the section uses information obtained from the *Davis General Plan*[3] associated EIR,[4] and the City of Davis' Climate Action and Adaptation Plan.[5]

4.2.2 EXISTING ENVIRONMENTAL SETTING

The following information provides an overview of the existing environmental setting in relation to air quality within the proposed project area. The air basin characteristics, ambient air quality standards (AAQS), attainment status and regional air quality plans, local air quality monitoring, odors, sensitive receptors, and GHG emissions are discussed below.

Air Basin Characteristics

The City of Davis is located in Yolo County, which is within the Yolo-Solano portion of the Sacramento Valley Air Basin (SVAB), which is under the jurisdiction of the YSAQMD. Air quality in the SVAB is largely the result of the following factors: emissions, geography, and meteorology (wind, atmospheric stability, and sunlight). The Sacramento Valley is often described as a bowl-shaped valley, with the SVAB being bounded by the North Coast Ranges on the west,

1 Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed September 2016.

2 ENVIRON International Corporation and the California Air Districts. *California Emissions Estimator Model User's Guide Version 2016.3.1*. September 2016.

3 City of Davis. *Davis General Plan*. Adopted May 2001. Amended through January 2007.

4 City of Davis. *Program EIR for the City of Davis General Plan Update and Project EIR for Establishment of a New Junior High School*. January 2000.

5 City of Davis. *Climate Action and Adaptation Plan*. June 1, 2010.

the northern Sierra Nevada Mountains on the east, and the intervening terrain being flat. The Sacramento Valley has a Mediterranean climate, characterized by hot, dry summers and mild, rainy winters. During the year, the temperature may range from 20 to 115 degrees Fahrenheit, with summer highs usually in the 90-degree Fahrenheit range and winter lows occasionally below freezing. Average annual rainfall is approximately 20 inches, with snowfall being very rare. The winds in the area are moderate in strength and vary from moist, clean breezes from the south to dry land flows from the north.[6] According to the Western Regional Climate Center, the prevailing wind direction throughout the year in the project area is from the south.[7]

The mountains surrounding the Sacramento Valley create a barrier to airflow, which can trap air pollutants in the valley when meteorological conditions are right and a temperature inversion exists. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the valley. The lack of surface wind during such periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in the air. The surface concentrations of pollutants are highest when these conditions are combined with smoke from agricultural burning, which is regulated through YSAQMD permits, or when temperature inversions trap cool air, fog, and pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds, with the Delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. However, during approximately half of the days from July to September, a phenomenon called the "Schultz Eddy" prevents such transport from occurring. Instead of allowing for the prevailing wind patterns to move north, carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern and pollutants to circle back southward. The Schultz Eddy effect exacerbates the pollution levels in the area and increases the likelihood of violating the federal and State air quality standards.

Ambient Air Quality Standards

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, known as criteria pollutants, because the criteria air pollutants could be detrimental to human health and the environment. The criteria pollutants include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. Primary standards are the set of limits based on human health; and secondary standards are the set of limits intended to prevent environmental and property damage. States may also establish their own ambient air quality standards, provided the State standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to Health and Safety Code Section 39606(b)

[6] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed September 2016.

[7] Western Regional Climate Center. *Prevailing Wind Direction*. Available at: http://www.wrcc.dri.edu/htmlfiles/westwinddir.html. Accessed September 2016.

and its predecessor statutes. The State of California has established air quality standards for some pollutants not addressed by federal standards, including hydrogen sulfide, sulfates, vinyl chloride, and visibility-reducing particles. The NAAQS and CAAQS summarized in Table 4.2-1 below, represent the maximum amount of a pollutant that can be present in outdoor air without harm to public health.[8] As shown in the table, in general, the CAAQS are more stringent, particularly for ozone and particulate matter, than the NAAQS.

A summary of the pollutants, their characteristics, health effects, and typical sources is provided in Table 4.2-2 below. Of the pollutants, particle pollution and ground-level ozone are the most widespread health threats.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are also a category of environmental concern. TACs are present in many types of emissions with varying degrees of toxicity. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Common stationary sources of TACs include gasoline stations, dry cleaners, and diesel backup generators, which are subject to YSAQMD stationary source permit requirements. The other, often more significant, common source type is on-road motor vehicles, such as cars and trucks, on freeways and roads, and off-road sources such as construction equipment, ships, and trains.

Cars and trucks release at least 40 different TACs. In terms of health risks, the most volatile contaminants are diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene and acetaldehyde. Gasoline vapors contain several TACs, including benzene, toluene, and xylenes. Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust, DPM, is composed of carbon particles and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of such chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. Diesel exhaust also contains gaseous pollutants, including volatile organic compounds and NO_X. Due to the published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects, the California Air Resources Board (CARB) has identified DPM from diesel-fueled engines as a TAC.

More than 90 percent of DPM is less than one micrometer in diameter, and, thus, DPM is a subset of $PM_{2.5}$. As a California statewide average, DPM comprises about eight percent of $PM_{2.5}$ in outdoor air, although DPM levels vary regionally due to the non-uniform distribution of sources throughout the State. Most major sources of diesel emissions, such as ships, trains, and trucks, operate in and around ports, rail yards, and heavily-traveled roadways. Such areas are often located near highly populated areas. Thus, elevated DPM levels are mainly an urban problem, with large numbers of people exposed to higher DPM concentrations, resulting in greater health consequences compared to rural areas.

[8] California Air Resource Board. *Ambient Air Quality Standards (AAQS)*. July 2, 2013. Available at: http://www.arb.ca.gov/research/aaqs/aaqs.htm. Accessed September 2016.

Table 4.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS	
			Primary	Secondary
Ozone	1 Hour	0.09 ppm	-	Same as primary
	8 Hour	0.070 ppm	0.075 ppm	
Carbon Monoxide	8 Hour	9 ppm	9 ppm	-
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Mean	0.030 ppm	53 ppb	Same as primary
	1 Hour	0.18 ppm	100 ppb	-
Sulfur Dioxide	24 Hour	0.04 ppm	-	-
	3 Hour	-	-	0.5 ppm
	1 Hour	0.25 ppm	75 ppb	-
Respirable Particulate Matter (PM_{10})	Annual Mean	20 ug/m^3	-	Same as primary
	24 Hour	50 ug/m^3	150 ug/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	12 ug/m^3	12 ug/m^3	15 ug/m^3
	24 Hour	-	35 ug/m^3	Same as primary
Lead	30 Day Average	1.5 ug/m^3	-	-
	Calendar Quarter	-	1.5 ug/m^3	Same as primary
Sulfates	24 Hour	25 ug/m^3	-	-
Hydrogen Sulfide	1 Hour	0.03 ppm	-	-
Vinyl Chloride	24 Hour	0.010 ppm	-	-
Visibility Reducing Particles[1]	8 Hour	see note below	-	-

ppm = parts per million
ppb = parts per billion
µg/m^3 = micrograms per cubic meter

1. Statewide Visibility Reducing Particle Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Source: California Air Resources Board. Ambient Air Quality Standards. June 4, 2013. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed September 2016.

Table 4.2-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone (O_3)	• A highly reactive gas consisting of three oxygen atoms • Often called photochemical smog • Produced by photochemical process involving the sun's energy • A secondary pollutant formed from a chemical reaction between ROG and NO_X emissions in the presence of sunlight • Levels are highest during summer and during the afternoon and early evening hours	• Eye irritation • Wheezing, chest pain, dry throat, headache, or nausea • Aggravated respiratory disease such as emphysema, bronchitis, and asthma	Combustion sources such as factories, automobiles, and evaporation of solvents and fuels.
Reactive Organic Gas (ROG)	• Reactive chemical gas composed of hydrocarbon compounds • Contributes to formation of smog and ozone through atmospheric chemical reactions	• Some compounds that make up ROG are toxic, such as the carcinogen benzene	Paints and solvents.
Oxides of Nitrogen (NO_X)	• Gaseous nitrogen compounds • Precursors to the formation of ozone and particulate matter • Nitrogen dioxide is major component • NO_X reacts with ROG to form smog	• Component of acid rain • Lung irritation • Lung damage • Chronic respiratory disease	Combustion of fossil fuels under high temperature and pressure, and motor vehicles.
Carbon Monoxide (CO)	• An odorless, colorless, highly toxic gas formed by the incomplete combustion of fuels • Emitted directly into the air • Primarily a winter pollution problem due to cold stagnant weather conditions	• Impairment of oxygen transport in the bloodstream • Impaired vision, reduced alertness, chest pain, and headaches • Reduction in mental and physical functions • Can be fatal in the case of very high concentrations	Automobile exhaust, combustion of fuels, and combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide (NO_2)	• A reddish-brown gas that discolors the air and is formed during combustion of fossil fuels under high temperature and pressure.	• Lung irrigation and damage • Increased risk of acute and chronic respiratory disease	Automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants.
Sulfur Dioxide	• A colorless, irritating gas • Has a rotten egg odor	• Aggravation of chronic obstruction lung disease	Combustion of sulfur-containing

(Continued on next page)

Table 4.2-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
(SO_2)	• Particles are a component of PM_{10}	• Increased risk of acute and chronic respiratory disease	fossil fuels from mobile sources, such as locomotives, shops, and off-road diesel equipment, and industrial processes, such as petroleum refining and metal processing.
Particulate Matter (PM_{10} and $PM_{2.5}$)	• A complex mixture of extremely small particles and liquid droplets • Made up of a number of components, including acids, organic chemicals, metals and soil or dust particles • Size of particles directly linked to potential for causing health impacts • Particles 10 micrometers in diameter or smaller (PM_{10}) can pass through the throat and nose and enter the lungs • USEPA groups particle pollution into three categories based on the size of the particles and where they are deposited: o "Inhalable coarse particles ($PM_{2.5-10}$)," which are found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs. o "Fine particles ($PM_{2.5}$)," which are found in smoke and haze, are 2.5 micrometers in diameter and smaller. $PM_{2.5}$ particles could be directly emitted from sources such as forest fires, or could form when gases emitted from power plants, industries, and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs. o "Ultrafine particles (UFP)," which are very, very small	• Aggravation of chronic respiratory disease • Heart and lung disease • Coughing or difficulty breathing • Bronchitis • Chronic respiratory disease in children • Irregular heartbeat • Nonfatal heart attacks • Increased blood pressure	Combustion sources such as automobiles, power generation, industrial processes, and wood burning. Also from unpaved roads, farming activities, and fugitive windblown dust.

(Continued on next page)

Table 4.2-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
	particles (less than 0.1 micrometers in diameter) largely resulting from the combustion of fossil fuels, meat, wood, and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, their high surface area, deep lung penetration, and transfer into the bloodstream could result in disproportionate health impacts relative to their mass. UFP is not currently regulated separately, but is analyzed as part of $PM_{2.5}$. • PM_{10}, $PM_{2.5-10}$, and UFP include primary pollutants (emitted directly to the atmosphere) as well as secondary pollutants (formed in the atmosphere by chemical reactions among precursors)		
Lead	• A soft and chemically resistant metal • A natural constituent of air, water, and the biosphere • Is not created nor destroyed in the environment • As an air pollutant, lead is present in small particles • Present in many soils and could become re-suspended into the air	• Impaired blood formation and nerve conduction • Fatigue, anxiety, short-term memory loss, depression, loss of appetite, weakness, apathy, and miscarriage • Lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract • Learning disabilities in children • Cancer	Industrial sources combustion of leaded gasoline, and contaminated soils.
Sulfates (SO_4^{2-})	• The fully oxidized ionic form of sulfur • Colorless gas • Occur in combination with metal and/or hydrogen ions • Sulfur compounds occur from combustion of petroleum fuels containing sulfur, where the sulfur is oxidized to SO_2 during the combustion process and converted to sulfate compounds in the atmosphere	• Aggravation of respiratory symptoms • Decrease in ventilatory function • Aggravation of asthmatic symptoms	Combustion of petroleum-derived fuels that contain sulfur.

(Continued on next page)

Table 4.2-2
Summary of Criteria Air Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
	• Conversion of SO_2 to sulfates occurs rapidly and completely in urban areas	• Increased risk of cardio-pulmonary disease	
Hydrogen Sulfide (H_2S)	• A colorless, flammable gas with a rotten egg odor • Extremely hazardous in high concentrations, especially in enclosed spaces • Occurs naturally in crude petroleum, natural gas, and hot springs • Produced by bacterial breakdown of organic materials and human and animal wastes	• Irritation of the eyes, nose, throat, and respiratory system • Aggravation of asthmatic symptoms • Headaches, fatigue, irritability, insomnia, digestive disturbances, and weight loss • Nausea, vomiting, staggering, and excitability • High concentrations can cause shock, convulsions, inability to breathe, extremely rapid unconsciousness, coma, and death	Geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.
Vinyl Chloride (C_2H_3Cl, or VCM)	• A colorless gas that does not occur naturally, but is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down • Used to make polyvinyl chloride (PVC), which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials	• Central nervous system effects, such as dizziness, drowsiness, and headaches • Liver damage • Cancer	Exhaust gases from factories that manufacture or process vinyl chloride, or evaporation from chemical waste storage areas.

Sources:

- *California Air Resources Board. California Ambient Air Quality Standards (CAAQS). Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm. Accessed September 2016.*
- *Sacramento Metropolitan, El Dorado, Feather River, Placer, and Yolo-Solano Air Districts, Spare the Air website. Air Quality Information for the Sacramento Region. Available at: http://www.sparetheair.com/health.cfm?page=healthoverall. Accessed September 2016.*
- *California Air Resources Board. Glossary of Air Pollution Terms. Available at: http://www.arb.ca.gov/html/gloss.htm. Accessed September 2016.*

Due to the high levels of diesel activity, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Construction-related activities also have the potential to generate concentrations of DPM from on-road haul trucks and off-road equipment exhaust emissions. Major distribution centers or other land uses that involve heavy truck traffic or idling, or substantial use of stationary diesel engines, are not located in the vicinity of the proposed project. Interstate 80 (I-80), a high-volume freeway, is located approximately 600 feet to the south of the proposed project site. The Union Pacific Railroad (UPRR) tracks are located directly to the north of the project site, and tracks owned by the California Northern Railroad Company (CNRC) intersect the UPRR tracks to the north of the project site. The UPRR tracks are currently used for freight and passenger train operations. The Health and Safety Element of the Yolo County General Plan estimates that UPRR operates, at most, 35 daily freight trains through the county, with each train powered by as many as eight locomotives.[9] However, 24-hour noise monitoring at the project site indicated that approximately 21 freight trains pass along the UPRR lines near the project site.[10] The passenger train operations, conducted by Amtrak on the UPRR tracks, involve 34 passenger trains per day.[11] Additionally, CNRC operations through Davis were assumed to include two trains per day.[12] It should be noted that the CARB does not typically consider railroad tracks to represent a potentially significant source of TAC emissions, because trains typically do not idle on tracks; instead trains on railroad tracks are more often moving through the area, which disperses the TACs being emitted by the locomotive's diesel engine. However, the CARB does consider rail yards to be a significant source of TACs, because rail yard operations involve significant amounts of train idling and maintenance testing in addition to train movement. The idling of trains allows for a greater concentration of TACs, as the trains are not moving, yet their locomotive engines continue to run. Although the UPRR tracks near the site are not considered a railyard, Amtrak passenger trains do stop at the Davis Amtrak station, located to the northwest of the project site, and idle for approximately one minute.[13] Furthermore, the CNRC operates a switching facility to the north of the project site, alongside the UPRR mainlines. While the CNRC switching facility is not considered a railyard, trains do stop at the switching facility to connect and disconnect freight to facilitate freight transfer between the CNRC and the UPRR.

The size of diesel particulates that are of the greatest health concern are fine particles (i.e., $PM_{2.5}$) and ultrafine particles (UFPs). UFPs have a smaller diameter (on the order of 0.1 micrometers).[14] The small diameter of UFPs imparts the particulates with unique attributes, such as high surface areas and the ability to penetrate deeply into lungs. Once UFPs have been deposited in lungs, the small diameter allows the UFPs to be transferred to the bloodstream. The high surface area of the

---

9 County of Yolo. *2030 Countywide General Plan: Health and Safety Element* [pg. HS-50-HS51]. Adopted November 10, 2009.

10 j.c. brennan & associates, Inc. *Lincoln40 Residential Environmental Noise Assessment. March 15,* 2017.

11 Bomar, Clem A. Division of Rail and Mass Transportation. Personal Communication [email] with Nick Pappani, Vice President of Raney Planning & Management, Inc. September 06, 2016.

12 County of Yolo. *2030 Countywide General Plan: Health and Safety Element* [pg. HS-50-HS51]. Adopted November 10, 2009.

13 Allison, Jim, Manager of Planning, Capitol Corridor Joint Powers Authority. Personal Communication [email] with Nick Pappani, Vice President of Raney Planning & Management. September 1, 2016.

14 South Coast Air Quality Management District. *Final 2012 Air Quality Management Plan*. December 2012.

UFPs also allows for a greater adsorption of other chemicals, which are transported along with the UFPs into the bloodstream of the inhaler, where the chemicals can eventually reach critical organs.[15] The penetration capability of UFPs may contribute to adverse health effects related to heart, lung, and other organ health.[16] UFPs are a subset of DPM and activities that create large amounts of DPM, such as the operations involving heavy diesel-powered engines, also release UFPs. Therefore, operations related to the UPRR tracks and I-80 would involve UFP emissions.

Health risks from TACs are a function of both the concentration of emissions and the duration of exposure, which typically are associated with long-term exposure and the associated risk of contracting cancer. Health effects of exposure to TACs other than cancer include birth defects, neurological damage, and death. Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established AAQS. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an AAQS or emission-based threshold.

Naturally Occurring Asbestos

Another concern related to air quality is naturally occurring asbestos (NOA). Asbestos is a term used for several types of naturally-occurring fibrous minerals, typically associated with serpentine and ultramafic rocks, found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. When rock containing asbestos is broken or crushed, asbestos fibers may be released and become airborne. Exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest and abdominal cavity), and asbestosis (a non-cancerous lung disease which causes scarring of the lungs). Because asbestos is a known carcinogen, NOA is considered a TAC. Sources of asbestos emissions include: unpaved roads or driveways surfaced with ultramafic rock; construction activities in ultramafic rock deposits; or rock quarrying activities where ultramafic rock is present.

According to mapping prepared by the California Geological Survey, Yolo County is not in an area likely to contain NOA.[17] In addition, the project site is located in a developed area of the City and currently contains existing development, under which lies fill material. For the aforementioned reasons, NOA is not expected to be present at the project site.

For a discussion of the potential presence of asbestos within the existing structures at the project site, refer to Section 4.5, Hazards and Hazardous Materials, of this EIR.

---

[15] Health Effects Institute. *Understanding the Health Effects of Ambient Ultrafine Particles*. Available at: https://www.healtheffects.org/system/files/Perspectives3-ExecutiveSummary.pdf. Accessed February 2017.

[16] South Coast Air Quality Management District. *Final 2012 Air Quality Management Plan*. December 2012.

[17] California Department of Conservation, Division of Mines and Geology. *A General Location Guide For Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos*. August 2000.

Attainment Status and Regional Air Quality Plans

Areas not meeting the NAAQS presented in Table 4.2-1, above, are designated by the USEPA as nonattainment. Further classifications of nonattainment areas are based on the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious. The CAA requires areas violating the NAAQS to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures for states to use to attain the NAAQS. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA reviews SIPs to determine if they conform to the mandates of the federal CAA amendments and would achieve air quality goals when implemented.

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA) of 1988. The CCAA classifies ozone nonattainment areas as moderate, serious, severe, and extreme based on severity of violations of CAAQS. For each nonattainment area classification, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment areas, attainment plans are required to demonstrate a five-percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. Air districts with air quality that is in violation of CAAQS are required to prepare an air quality attainment plan that lays out a program to attain the CCAA mandates.

Table 4.2-3 below presents the current attainment status of the jurisdictional area of the YSAQMD. As shown in the table, Yolo County is in attainment for all State and federal AAQS, with the exception of ozone, PM_{10}, and $PM_{2.5}$. At the federal level, the area is designated as severe nonattainment for the 8-hour ozone standard, nonattainment for the 24-hour $PM_{2.5}$ standard, and attainment or unclassified for all other criteria pollutants. At the State level, the area is designated as a serious nonattainment area for the 1-hour ozone standard, nonattainment for the 8-hour ozone standard, nonattainment for the PM_{10} and $PM_{2.5}$ standards, and attainment or unclassified for all other State standards. Although the 1-Hour federal ozone standard has been revoked, on October 18, 2012, the USEPA officially determined that the Sacramento Federal Nonattainment Area (SFNA), which includes Sacramento and Yolo counties, Placer and El Dorado counties (except Lake Tahoe Basin portions), Solano County (eastern portion), and Sutter County (southern portion), attained the revoked 1-hour ozone NAAQS. The determination became effective November 19, 2012.[18]

Due to the nonattainment designations, the YSAQMD, along with the other air districts in the SVAB region, is required to develop plans to attain the federal and State standards for ozone and particulate matter. The air quality plans include emissions inventories to measure the sources of air pollutants, to evaluate how well different control measures have worked, and show how air pollution would be reduced. In addition, the plans include the estimated future levels of pollution

[18] U.S. Environmental Protection Agency. *Air Actions in the Sacramento Metro Area*. October 3, 2012. Available at: http://www.epa.gov/region9/air/actions/sacto/index.html. Accessed September 2016.

to ensure that the area would meet air quality goals. Each of the attainment plans currently in effect are discussed in further detail in the Regulatory Context discussion of this section.

Table 4.2-3
Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	**State Standards**
Ozone – 1-Hour	Revoked in 2005	**Nonattainment**
Ozone – 8-Hour	**Severe Nonattainment**	**Nonattainment**
Carbon Monoxide	Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Attainment (Pending)	Attainment
PM_{10}	Attainment	**Nonattainment**
$PM_{2.5}$ – 24-Hour	**Nonattainment**	No State Standard
$PM_{2.5}$ – Annual	Unclassified/Attainment	**Nonattainment**
Lead	Unclassified/Attainment	Attainment
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Visibility Reducing Particles	No Federal Standard	Unclassified

Sources:

- *YSAQMD. Meeting Health Standards. Available at: http://www.ysaqmd.org/planning/status.php. Accessed September 2016.*
- *Sacramento Metropolitan Air Quality Management District. Air Quality Standards Attainment Status. Available at: http://www.airquality.org/Air-Quality-Health/Air-Quality-Pollutants-and-Standards (last updated on December 23, 2013). Accessed September 2016.*

Local Air Quality Monitoring

Air quality is monitored by CARB at various locations to determine which air quality standards are being violated, and to direct emission reduction efforts, such as developing attainment plans and rules, incentive programs, etc. The nearest monitoring station to the City of Davis and the proposed project site would be the Davis-UCD Campus station, located along Campbell Road between Hutchison Drive and Garrod Drive in Davis, approximately two miles west of the project site. The Davis-UCD Campus station does not have data available for $PM_{2.5}$ and PM_{10}; thus, the nearest station with such data was used, which was the Woodland-Gibson Road station located at 41929 Gibson Road in Woodland, approximately eight miles north of the project site. Table 4.2-4 presents the number of days that each criteria air pollutant standard was exceeded and/or the annual average mean concentrations for the years 2013 through 2015 for those pollutants for which monitoring data is available from the Davis-UCD Campus and Woodland-Gibson Road monitoring stations. The USEPA uses such data (air quality monitoring data for the most recent three-year period), as well as a number of other factors, in making final determinations regarding area designations.

Table 4.2-4
Air Quality Monitoring Data Summary for Project Area

Pollutant	Standard	Days Standard Exceeded During: 2013	2014	2015
Ozone	1-Hour State	0	0	0
	8-Hour State	0	0	1
	8-Hour Federal	0	0	0
PM_{10}[1]	24 Hour State	4	0	2
	Annual Mean State	23.7	17.4	21.8
	24 Hour Federal	0	0	0
$PM_{2.5}$[1]	Annual Mean State	*	*	*
	Annual Mean Federal	7.4	5.9	7.5
	24 Hour Federal	0	0	0
Nitrogen Dioxide	Annual Mean State	6	5	5
	1-Hour State	0	0	0
	1-Hour Federal	0	0	0

[1] Obtained from the Woodland-Gibson Road monitoring station.
* Data not available.

Source: California Air Resources Board. Aerometric Data Analysis and Management (ADAM): Top Four Summary. Available at: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed September 2016.

Odors

While offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable annoyance and distress among the public and can generate citizen complaints to local governments and air districts. Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative or formulaic methodologies to determine the presence of a significant odor impact do not exist. Adverse effects of odors on residential areas and other sensitive receptors warrant the closest scrutiny; but consideration should also be given to other land use types where people congregate, such as recreational facilities, worksites, and commercial areas. The potential for an odor impact is dependent on a number of variables including the nature of the odor source, distance between a receptor and an odor source, and local meteorological conditions.

One of the most important factors influencing the potential for an odor impact to occur is the distance between the odor source and receptors, also referred to as a buffer zone or setback. The greater the distance between an odor source and receptor, the less concentrated the odor emission would be when reaching the receptor.

Meteorological conditions also affect the dispersion of odor emissions, which determines the exposure concentration of odiferous compounds at receptors. The predominant wind direction in an area influences which receptors are exposed to the odiferous compounds generated by a nearby source. Receptors located upwind from a large odor source may not be affected due to the produced odiferous compounds being dispersed away from the receptors. Wind speed also influences the degree to which odor emissions are dispersed away from any area.

Odiferous compounds can be generated from a variety of source types including both construction and operational activities. A project's operations, depending on the project type, can generate a large range of odiferous compounds that can be considered offensive to receptors. Examples of common land use types that typically generate significant odor impacts include, but are not limited to wastewater treatment plants; sanitary landfills; composting/green waste facilities; recycling facilities; petroleum refineries; chemical manufacturing plants; painting/coating operations; rendering plants; and food packaging plants.

Although less common, diesel fumes associated with substantial diesel-fueled equipment and heavy-duty trucks, such as from construction activities, freeway traffic, or railways, could be found to be objectionable.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, childcare centers, playgrounds, retirement homes, convalescent homes, hospitals, and medical clinics.

The existing nearby residential developments, opposite the project site along Olive Drive, as well as along the western boundary of the project site at Slatter's Court, would be considered the nearest sensitive receptors to the site. The nearest existing school, which would be considered a sensitive receptor, to the project site is the Davis Community Church Nursery School, which is located over 1,950 feet from the northwestern border of the project site.

Greenhouse Gas Emissions

GHGs are gases that absorb and emit radiation within the thermal infrared range, trapping heat in the earth's atmosphere. Some GHGs occur naturally and are emitted into the atmosphere through both natural processes and human activities. Other GHGs are created and emitted solely through human activities. The principal GHGs that enter the atmosphere due to human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated carbons. Other common GHGs include water vapor, ozone, and aerosols. The increase in atmospheric concentrations of GHG due to human activities has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change.

The primary GHG emitted by human activities is CO_2, with the next largest components being CH_4 and N_2O. A wide variety of human activities result in the emission of CO_2; some of the largest sources of CO_2 include the burning of fossil fuels for transportation and electricity, industrial processes including fertilizer production, agricultural processing, and cement production. The primary sources of CH_4 emissions include domestic livestock sources, decomposition of wastes in landfills, releases from natural gas systems, coal mine seepage, and manure management. The main human activities producing N_2O are agricultural soil management,

fuel combustion in motor vehicles, nitric acid production, manure management, and stationary fuel combustion. Emissions of GHG by economic sector indicate that energy-related activities account for the majority of U.S. emissions. Electricity generation is the largest single-source of GHG emissions, and transportation is the second largest source, followed by industrial activities. The agricultural, commercial, and residential sectors account for the remainder of GHG emission sources.[19]

Emissions of GHG are partially offset by uptake of carbon and sequestration in trees, agricultural soils, landfilled yard trimmings and food scraps, and absorption of CO_2 by the earth's oceans. Additional emission reduction measures for GHG could include, but are not limited to, compliance with local, State, or federal plans or strategies for GHG reductions, on-site and off-site mitigation, and project design features. Attainment concentration standards for GHGs have not been established by the federal or State government.

Global Warming Potential

Global Warming Potential (GWP) is one type of simplified index (based upon radiative properties) that can be used to estimate the potential future impacts of emissions of various gases. According to the USEPA, the global warming potential of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." The reference gas for comparison is CO_2. GWP is based on a number of factors, including the heat-absorbing ability of each gas relative to that of CO_2, as well as the decay rate of each gas relative to that of CO_2. Each gas's GWP is determined by comparing the radiative forcing associated with emissions of that gas versus the radiative forcing associated with emissions of the same mass of CO_2, for which the GWP is set at one. Methane gas, for example, is estimated by the USEPA to have a comparative global warming potential 21 times greater than that of CO_2, as shown in Table 4.2-5.

As shown in the table, at the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative GWP 22,800 times that of CO_2. The "specified time horizon" is related to the atmospheric lifetimes of such GHGs, which are estimated by the USEPA to vary from 50 to 200 years for CO_2, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming potential of a gas. The common indicator for GHG is expressed in terms of metric tons of CO_2 equivalents ($MTCO_2e$), which is calculated based on the global warming potential for each pollutant.

[19] U.S. Environmental Protection Agency. *Sources of Greenhouse Gas Emissions.* Available at: http://epa.gov/climatechange/ghgemissions/sources/industry.html. Accessed August 2016.

Table 4.2-5 Global Warming Potentials and Atmospheric Lifetimes of Select GHGs		
Gas	**Atmospheric Lifetime (years)**	**Global Warming Potential (100-year time horizon)**
Carbon Dioxide (CO_2)	50-200[1]	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

1. For a given amount of carbon dioxide emitted, some fraction of the atmospheric increase in concentration is quickly absorbed by the oceans and terrestrial vegetation, some fraction of the atmospheric increase will only slowly decrease over a number of years, and a small portion of the increase will remain for many centuries or more.

Source: USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013, April 15, 2015.

Effects of Global Climate Change

Uncertainties exist as to exactly what the climate changes will be in various areas of the Earth. According to the Intergovernmental Panel on Climate Change's Working Group II Report, *Climate Change 2007: Impacts, Adaptation and Vulnerability*,[20] climate change impacts to North America may include:

- Diminishing snowpack;
- Increasing evaporation;
- Exacerbated shoreline erosion;
- Exacerbated inundation from sea level rising;
- Increased risk and frequency of wildfire;
- Increased risk of insect outbreaks;
- Increased experiences of heat waves; and
- Rearrangement of ecosystems as species and ecosystems shift northward and to higher elevations.

For California, climate change has the potential to cause/exacerbate the following environmental impacts:

- Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone);

[20] Intergovernmental Panel on Climate Change. *Climate Change 2007: Impacts, Adaptation, and Vulnerability.* 2007.

- Reduced precipitation, changes to precipitation and runoff patterns, reduced snowfall (precipitation occurring as rain instead of snow), earlier snowmelt, decreased snowpack, and increased agricultural demand for water;
- Increased growing season and increased growth rates of weeds, insect pests and pathogens;
- Inundation by sea level rise;
- Increased incidents and severity of wildfire events; and
- Expansion of the range and increased frequency of pest outbreaks.

4.2.3 REGULATORY CONTEXT

Air quality is monitored and regulated through the efforts of various international, federal, State, and local government agencies. Agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating and improving the air quality within the City of Davis area are discussed below.

Federal Regulations

The most prominent federal regulation is the CAA, which is implemented and enforced by the USEPA.

CAA and USEPA

The CAA requires the USEPA to set NAAQS and designate areas with air quality not meeting NAAQS as nonattainment. The USEPA is responsible for enforcement of NAAQS for atmospheric pollutants and regulates emission sources that are under the exclusive authority of the federal government including emissions of GHGs. The USEPA's air quality mandates are drawn primarily from the CAA, which was signed into law in 1970. Congress substantially amended the CAA in 1977 and again in 1990. The USEPA has adopted policies consistent with CAA requirements demanding states to prepare SIP that demonstrate attainment and maintenance of the NAAQS.

The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG emissions from large sources and suppliers in the U.S., and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the USEPA. To track the national trend in emissions and removals of GHG since 1990, USEPA develops the official U.S. GHG inventory each year.

On December 7, 2009, USEPA issued findings under Section 202(a) of the CAA concluding that GHGs are pollutants that could endanger public health. Under the so-called Endangerment Finding, USEPA found that the current and projected concentrations of the six key well-mixed GHGs – CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs – in the atmosphere threaten the public health and

welfare of current and future generations. These findings do not, by themselves, impose any requirements on industry or other entities.

State Regulations

California has adopted a variety of regulations aimed at reducing air pollution and GHG emissions. The adoption and implementation of the key State legislation described in further detail below demonstrates California's leadership in addressing air quality. Only the most prominent and applicable California air quality- and GHG-related legislation are included below; however, an exhaustive list and extensive details of California air quality legislation can be found at the CARB website (http://www.arb.ca.gov/html/lawsregs.htm).

State Regulations Related to Air Quality

The following regulations address air quality within California.

CCAA and CARB

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA requires that air quality plans be prepared for areas of the State that have not met the CAAQS for ozone, CO, NO_X, and SO_2. Among other requirements of the CCAA, the plans must include a wide range of implementable control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls. The CARB, California's air quality management agency, regulates and oversees the activities of county air pollution control districts and regional air quality management districts. The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through planning and coordinating activities. In addition, the CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the USEPA. Furthermore, the CARB is charged with developing rules and regulations to cap and reduce GHG emissions.

Air Quality and Land Use Handbook

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB Handbook) addresses the importance of considering health risk issues when siting sensitive land uses, including residential development, in the vicinity of intensive air pollutant emission sources including freeways or high-traffic roads, distribution centers, ports, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities.[21] The CARB Handbook draws upon studies evaluating the health effects of traffic traveling on major interstate highways in metropolitan

[21] California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.

California centers within Los Angeles (I-405 and I-710), the San Francisco Bay, and San Diego areas. The recommendations identified by CARB, including siting residential uses a minimum distance of 500 feet from freeways or other high-traffic roadways, are consistent with those adopted by the State of California for location of new schools. Specifically, the CARB Handbook recommends, "Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day" (CARB 2005).

Importantly, the Introduction section of the CARB Handbook clarifies that the guidelines are strictly advisory, recognizing that: "[l]and use decisions are a local government responsibility. The Air Resources Board Handbook is advisory and these recommendations do not establish regulatory standards of any kind." CARB recognizes that there may be land use objectives as well as meteorological and other site-specific conditions that need to be considered by a governmental jurisdiction relative to the general recommended setbacks, specifically stating, "[t]hese recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues" (CARB 2005).

Assembly Bill 1807

Assembly Bill (AB) 1807, enacted in September 1983, sets forth a procedure for the identification and control of TACs in California. CARB is responsible for the identification and control of TACs, except pesticide use, which is regulated by the California Department of Pesticide Regulation.

AB 2588

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588), California Health and Safety Code Section 44300 et seq., provides for the regulation of over 200 TACs, including DPM, and is the primary air contaminant legislation in California. Under the act, local air districts may request that a facility account for its TAC emissions. Local air districts then prioritize facilities on the basis of emissions, and high priority designated facilities are required to submit a health risk assessment and communicate the results to the affected public.

Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations

In 2002, the Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations (Title 17, Section 93105, of the California Code of Regulations) went into effect, which requires each air pollution control and air quality management district to implement and enforce the requirements of Section 93105 and propose their own asbestos ATCM as provided in Health and Safety Code section 39666(d).[22]

[22] California Air Resources Board. *2002-07-29 Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations.* June 3, 2015. Available at: http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm. Accessed August 2016.

Senate Bill 656

In 2003, the Legislature passed Senate Bill (SB) 656 to reduce public exposure to PM_{10} and $PM_{2.5}$ above the State CAAQS. The legislation requires the CARB, in consultation with local air pollution control and air quality management districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air districts to reduce PM_{10} and $PM_{2.5}$ emissions. The CARB list is based on California rules and regulations existing as of January 1, 2004, and was adopted by CARB in November 2004. Categories addressed by SB 656 include measures for reduction of emissions associated with residential wood combustion and outdoor greenwaste burning, fugitive dust sources such as paved and unpaved roads and construction, combustion sources such as boilers, heaters, and charbroiling, solvents and coatings, and product manufacturing. Some of the measures include, but are not limited to, the following:

- Reduce or eliminate wood-burning devices allowed;
- Prohibit residential open burning;
- Permit and provide performance standards for controlled burns;
- Require water or chemical stabilizers/dust suppressants during grading activities;
- Limit visible dust emissions beyond the project boundary during construction;
- Require paving/curbing of roadway shoulder areas; and
- Require street sweeping.

Under SB 656, each air district is required to prioritize the measures identified by CARB, based on the cost effectiveness of the measures and their effect on public health, air quality, and emission reductions. On July 13, 2005, the YSAQMD adopted an implementation schedule for SB 656.

Heavy-Duty Vehicle Idling Emission Reduction Program

On October 20, 2005, CARB approved a regulatory measure to reduce emissions of toxics and criteria pollutants by limiting idling of new and in-use sleeper berth equipped diesel trucks.[23] The regulation consists of new engine and in-use truck requirements and emission performance requirements for technologies used as alternatives to idling the truck's main engine. For example, the regulation requires 2008 and newer model year heavy-duty diesel engines to be equipped with a non-programmable engine shutdown system that automatically shuts down the engine after five minutes of idling, or optionally meet a stringent NO_X emission standard. The regulation also requires operators of both in-state and out-of-state registered sleeper berth equipped trucks to manually shut down their engine when idling more than five minutes at any location within California beginning in 2008. Emission producing alternative technologies such as diesel-fueled auxiliary power systems and fuel-fired heaters are also required to meet emission performance requirements that ensure emissions are not exceeding the emissions of a truck engine operating at idle.

[23] California Air Resources Board. *Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling*. October 24, 2013. Available at: http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm. Accessed August 2016.

In-Use Off-Road Diesel Vehicle Regulation

On July 26, 2007, CARB adopted a regulation to reduce DPM and NO_X emissions from in-use (existing), off-road, heavy-duty diesel vehicles in California.[24] Such vehicles are used in construction, mining, and industrial operations. The regulation is designed to reduce harmful emissions from vehicles by subjecting fleet owners to retrofit or accelerated replacement/repower requirements, imposing idling limitations on owners, operators, renters, or lessees of off-road diesel vehicles. The idling limits require operators of applicable off-road vehicles (self-propelled diesel-fueled vehicles 25 horsepower and up that were not designed to be driven on-road) to limit idling to less than five minutes. The idling requirements are specified in Title 13 of the California Code of Regulations.

State Regulations Related to Greenhouse Gases

The following regulations address GHG and climate change within California.

AB 1493

California AB 1493 (Stats. 2002, ch. 200) (Health & Safety Code, §42823, 43018.5), known as Pavley I, was enacted on July 22, 2002. AB 1493 requires that the CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state." On June 30, 2009, the USEPA granted a waiver of CAA preemption to California for the State's GHG emission standards for motor vehicles, beginning with the 2009 model year. Pursuant to the CAA, the waiver allows for the State to have special authority to enact stricter air pollution standards for motor vehicles than the federal government's. On September 24, 2009, the CARB adopted amendments to the Pavley regulations (Pavley I) that reduce GHG emissions in new passenger vehicles from 2009 through 2016. The second phase of the Pavley regulations (Pavley II) is expected to affect model year vehicles from 2016 through 2020. The CARB estimates that the regulation would reduce GHG emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

Renewable Portfolio Standard (RPS)

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020.

[24] California Air Resources Board. *In-Use Off-Road Diesel Vehicle Regulation*. December 10, 2014. Available at: http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm. Accessed August 2016.

Executive Order S-03-05

On June 1, 2005, then-Governor Schwarzenegger signed Executive Order S-03-05, which established total GHG emission targets. Specifically, emissions are to be reduced to year 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal-EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the Executive Order, the Secretary of the Cal-EPA created a Climate Act Team (CAT) made up of members from various State agencies and commissions. In March 2006, CAT released their first report. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

AB 32

In September 2006, AB 32, the California Climate Solutions Act of 2006, was enacted (Stats. 2006, ch. 488) (Health & Saf. Code, §38500 et seq.). AB 32 delegated the authority for its implementation to the CARB and directs CARB to enforce the State-wide cap. Among other requirements, AB 32 required CARB to (1) identify the State-wide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020, and (2) develop and implement a Scoping Plan. Accordingly, the CARB has prepared the *Climate Change Scoping Plan* (Scoping Plan) for California, which was approved in 2008 and updated in 2014.[25] The Scoping Plan provides the outline for actions to reduce California's GHG emissions. Based on the reduction goals called for in the 2008 Scoping Plan, a 29 percent reduction in GHG levels relative to a Business As Usual (BAU) scenario would be required to meet 1990 levels by 2020. The reduction goal and BAU scenario for the Scoping Plan were based on 2005 emissions projections. A BAU scenario is a baseline condition based on what could or would occur on a particular site in the year 2020 without implementation of a proposed project or any required or voluntary GHG reduction measures, including any State regulation GHG emission reductions. A project's BAU scenario is project- and site-specific, and varies from project to project.

In 2011, the baseline or BAU level for the Scoping Plan was revised based on more recent (2010) data in order to account for the economic downturn and State regulation emission reductions (i.e., Pavley, Low Carbon Fuel Standard [LCFS], and Renewable Portfolio Standard [RPS]). Accordingly, the Scoping Plan emission reduction target from BAU levels required to meet 1990 levels by 2020 was modified from 29 percent to 21.7 percent (where BAU levels do not account for Statewide regulation emission reductions) below the revised estimated BAU level. The amended Scoping Plan was re-approved August 24, 2011, and updated in 2014.[26]

[25] California Air Resources Board. *First Update to the Climate Change Scoping Plan*. May 22, 2014.

[26] California Air Resources Board. *Status of Scoping Plan Recommended Measures*. Available at: http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed August 2016.

California GHG Cap-and-Trade Program

The AB 32 Scoping Plan identifies a cap-and-trade program as one of the strategies California will employ to reduce the GHG emissions that cause climate change. The program will help put California on the path to meet the GHG emission reduction goal of 1990 levels by the year 2020, and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors would be established by the cap-and-trade program and facilities subject to the cap would be able to trade permits (allowances) to emit GHGs. The CARB has designed a California cap-and-trade program that is enforceable and meets the requirements of AB 32.[27] The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions. On January 1, 2014 California linked the state's cap-and-trade plan with Quebec's, and on January 1, 2015 the program expanded to include transportation and natural gas fuel suppliers.[28]

Executive Order S-01-07

On January 18, 2007, then-Governor Schwarzenegger signed Executive Order S-01-07, which mandates that a State-wide goal be established to reduce carbon intensity of California's transportation fuels by at least 10 percent by 2020. The Order also requires that a LCFS for transportation fuels be established for California.

SB 97

SB 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under the California Environmental Quality Act (CEQA). The bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009.

As directed by SB 97, OPR amended the CEQA Guidelines, effective March 18, 2010, to provide guidance to public agencies regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in draft CEQA documents. The amendments include revisions to the *Appendix G Initial Study Checklist* that incorporates a new subdivision to address project-generated GHG emissions and contribution to climate change. The new subdivision emphasizes that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis. In addition, the revisions include a new subdivision to assist lead agencies in determining the significance of project related GHG emissions. Under the revised CEQA Appendix G checklist, an agency would consider whether the project will generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and whether the project conflicts with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of GHGs.

---

27 California Air Resources Board. *First Update to the Climate Change Scoping Plan*. May 2014.

28 California Air Resources Board. *Status of Scoping Initial Scoping Plan Measures*. Available at: https://www.arb.ca.gov/cc/scopingplan/2013_update/appendix_b.pdf. Accessed August 2016.

Guidance on determining the significance of impacts from GHG emissions is also provided in the SB 97 amendments. The guidance suggests the lead agency make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project. When assessing the significance of impacts from GHG emissions on the environment, lead agencies can consider the extent to which the project may increase or reduce GHG as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance determined applicable to the project, and/or the extent to which the project complies with adopted regulations or requirements to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. When adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

Under the SB 97 amendments, if GHG emissions of a project are determined to be significant, feasible means of mitigating GHG emissions, such as the following, shall be applied:

- Measurement of the reduction of emissions required as part of the lead agency's decision;
- Reductions in emissions resulting from project through project features, design, or other measures;
- Off-site measures, including offsets, to mitigate a project's emissions;
- Measures that sequester GHG gases; and
- If a GHG reduction plan, ordinance, regulation, or other similar plan is adopted, mitigation may include project-by-project measures, or specific measures or policies found in the plan that reduces the cumulative effect of emissions.

SB 375

In September 2008, SB 375, known as the Sustainable Communities and Climate Protection Act of 2008, was enacted, which is intended to build on AB 32 by attempting to control GHG emissions by curbing sprawl. SB 375 enhances CARB's ability to reach goals set by AB 32 by directing CARB to develop regional GHG emission reduction targets to be achieved by the State's 18 metropolitan planning organizations (MPOs), including the Sacramento Area Council of Governments (SACOG). Under SB 375, MPOs must align regional transportation, housing, and land-use plans and prepare a "Sustainable Communities Strategy" (SCS) to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. SB 375 provides incentives for creating walkable and sustainable communities and revitalizing existing communities, and allows home builders to get relief from certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Furthermore, SB 375 encourages the development of alternative transportation options, which will reduce traffic congestion.

Executive Order S-13-08

Then-Governor Arnold Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The Executive Order is intended to hasten California's response to the impacts of global climate

change, particularly sea level rise, and directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report, directing the Business, Transportation, and Housing Agency to assess the vulnerability of the State's transportation systems to sea level rise, and requiring the Office of Planning and Research and the Natural Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The order also required State agencies to develop adaptation strategies to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the State for the following areas: public health; ocean and coastal resources; water supply and flood protection; agriculture; forestry; biodiversity and habitat; and transportation and energy infrastructure. The report recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

AB 197 and SB 32

On September 8, 2016, AB 197 and SB 32 were enacted with the goal of providing further control over GHG emissions in the State. SB 32 built on previous GHG reduction goals by requiring that the CARB ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by the year 2030. Additionally, SB 32 emphasized the critical role that reducing GHG emissions would play in protecting disadvantaged communities and the public health from adverse impacts of climate change. Enactment of SB 32 was predicated on the enactment of AB 197, which seeks to make the achievement of SB 32's mandated GHG emission reductions more transparent to the public and responsive to the Legislature. Transparency to the public is achieved by AB 197 through the publication of an online inventory of GHG and TAC emissions from facilities required to report such emissions pursuant to Section 38530 of California's Health and Safety Code. AB 197 further established a six-member Joint Legislative Committee on Climate Change Policies, which is intended to provide oversight and accountability of the CARB, while also adding two new legislatively-appointed, non-voting members to the CARB. Additionally, AB 197 directs the CARB to consider the "social costs" of emission reduction rules and regulations, with particular focus on how such measures may impact disadvantaged communities.

California Building Standards Code

California's building codes (California Code of Regulations [CCR], Title 24) are published on a triennial basis, and contain standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Standards Commission (CBSC) is responsible for the administration and implementation of each code cycle, which includes the proposal, review, and adoption process. Supplements and errata are issued throughout the cycle to make necessary mid-term corrections. The 2016 code has been prepared and becomes effective January 1, 2017. The California building code standards apply State-wide; however, a local jurisdiction may amend a building code standard if the jurisdiction makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

California Green Building Standards Code

The 2016 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), is a portion of the CBSC, which became effective with the rest of the CBSC on January 1, 2017. 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 reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California.

The CALGreen Code encourages local governments to adopt more stringent voluntary provisions, known as Tier 1 and Tier 2 provisions, to further reduce emissions, improve energy efficiency, and conserve natural resources. If a local government adopts one of the tiers, the provisions become mandates for all new construction within that jurisdiction. The City of Davis adopted the Tier 1 CALGreen Code provisions for the 2010 and 2013 versions of the Code. As of January 1, 2017, the 2016 CALGreen Code has come into effect. Because the City adopted the Tier 1 provisions for previous versions of the Code, the City's adoption of the Tier 1 provisions of the 2016 CALGreen Code has been assumed for analysis purposes within this EIR.

Building Energy Efficiency Standards

The 2016 Building Energy Efficiency Standards is a portion of the CBSC, which expands upon energy efficiency measures from the 2013 Building Energy Efficiency Standards resulting in a 28 percent reduction in energy consumption from the 2013 standards for residential structures. Energy reductions relative to previous Building Energy Efficiency Standards would be achieved through various regulations including requirements for the use of high efficacy lighting, improved water heating system efficiency, and high performance attics and walls.

Local Regulations

The following are the regulatory agencies and regulations pertinent to the proposed project on a local level.

YSAQMD

Various local, regional, State and federal agencies share the responsibility for air quality management in Yolo County. The YSAQMD operates at the local level with primary responsibility for attaining and maintaining the federal and State AAQS in Yolo County. The YSAQMD is tasked with implementing programs and regulations required by the FCAA and the CCAA, including preparing plans to attain federal and State AAQS. The YSAQMD works jointly with the USEPA, CARB, Sacramento Area Council of Governments (SACOG), other air districts in the region, county and city transportation and planning departments, and various non-governmental organizations to improve air quality through a variety of programs. Programs include the adoption

of regulations, policies and guidance, extensive education and public outreach programs, as well as emission reducing incentive programs.

Nearly all development projects in the region have the potential to generate air pollutants that may increase the difficulty of attaining federal and State AAQS. Therefore, for most projects, evaluation of air quality impacts is required to comply with CEQA. In order to help public agencies evaluate air quality impacts, the YSAQMD has developed the *Handbook for Assessing and Mitigating Air Quality Impacts*.[29] The YSAQMD's handbook includes screening methodology and recommended thresholds of significance, including mass emission thresholds for construction-related and operational ozone precursors (ROG and NO_X) and PM_{10}. The YSAQMD's handbook also includes screening criteria for localized CO emissions and thresholds for new stationary sources of TACs. The YSAQMD's recommended thresholds of significance, as well as screening criteria and methodology, are discussed in further detail in the Standards of Significance section below.

YSAQMD Rules and Regulations

All projects under the jurisdiction of the YSAQMD are required to comply with all applicable YSAQMD rules and regulations. In addition, YSAQMD permit requirements apply to most industrial processes (e.g., manufacturing facilities, food processing), many commercial activities (e.g., print shops, drycleaners, gasoline stations), and other miscellaneous activities (e.g., demolition of buildings containing asbestos and aeration of contaminated soils). The YSAQMD regulations and rules include, but are not limited to, the following:

> Regulation II – Prohibition, Exceptions - Requirements
>
> Regulation II is comprised of prohibitory rules that are written to achieve emission reductions from specific source categories. The rules are applicable to existing sources as well as new sources. Examples of prohibitory rules include Rule 2.1 (Control of Emissions), Rule 2.28 (Cutback and Emulsified Asphalts), Rule 2.5 (Nuisance), Rule 2.11 (Particulate Matter Concentration), Rule 2.14 (Architectural Coatings), and Rule 2.40 (Wood Burning Appliances).

Air Quality Attainment Plans

Each of the attainment plans currently in effect for the SVAB are discussed in further detail below.

[29] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed September 2016.

2013 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan

The most recent attainment plan for the ozone NAAQS is the *2013 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan* (2013 Ozone Attainment Plan),[30] which demonstrates how existing and new control strategies would provide the necessary future emission reductions to meet the federal NAAQS. The SVAB's attainment deadline is 2027. Because the proposed project is located within the nonattainment area for ozone, the project would be subject to the requirements set forth in the 2013 Ozone Attainment Plan, as enforced by YSAQMD through rules and regulations.

$PM_{2.5}$ Implementation/Maintenance Plan and Re-designation Request for Sacramento $PM_{2.5}$ Nonattainment Area

The Sacramento federal $PM_{2.5}$ Nonattainment Area attained the federal $PM_{2.5}$ health standards on December 31, 2011. The *$PM_{2.5}$ Implementation/Maintenance Plan and Re-designation Request for Sacramento $PM_{2.5}$ Nonattainment Area* ($PM_{2.5}$ Implementation/Maintenance Plan)[31] was prepared to show that the region has met the requirements and requests that the USEPA re-designate the area to attainment. The USEPA issued a final rule for Determination of Attainment for the Sacramento Nonattainment Area effective August 14, 2013. The $PM_{2.5}$ Implementation/Maintenance Plan would be adopted by the air districts within the nonattainment area, as well as the CARB, as a revision to the SIP. Contents of the $PM_{2.5}$ Implementation/Maintenance Plan include demonstration that the NAAQS was met and that all requirements have been met for a re-designation to attainment, specification of actions to be taken if the standards are violated in the future, and establishment of regional motor vehicle emission budgets.

Because the proposed project is located within the nonattainment area for $PM_{2.5}$, the project would be subject to the requirements set forth in the $PM_{2.5}$ Implementation/Maintenance Plan, as enforced by YSAQMD through rules and regulations.

2016 Triennial Assessment and Plan Update

In addition to the federal attainment plans discussed above for meeting NAAQS, the CCAA requires air districts to endeavor to achieve and maintain the CAAQS and develop plans for attainment. Yolo County meets the CAAQS for sulfur dioxide, nitrogen dioxide, and carbon monoxide, but is designated nonattainment for the State ozone and particulate matter standards. The CCAA requires districts that do not meet the State ozone standard to adopt an Air Quality Attainment Plan and to submit progress reports to the CARB every

[30] Sacramento Metropolitan Air Quality Management District. *2013 Revisions to the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan.* September 26, 2013.

[31] Sacramento Metropolitan Air Quality Management District. *$PM_{2.5}$ Implementation/Maintenance Plan and Re-designation Request for Sacramento $PM_{2.5}$ Nonattainment Area*. October 24, 2013.

three years.[32] In July 2016, the YSAQMD adopted the 2016 Triennial Assessment and Plan Update.[33] The 2016 Triennial Assessment and Plan Update analyzes and summarizes data from the years 2012 through 2014, while also forecasting future emissions and reviewing efforts made by YSAQMD to improve air quality.

The YSAQMD is not required to prepare an attainment plan for PM_{10} or $PM_{2.5}$; however, the YSAQMD continues to work to reduce particulate emissions through rules affecting stationary sources, the construction industry, and the YSAQMD's agricultural burning program. The YSAQMD also works with the CARB to identify measures that can, where possible, reduce both ozone and particulate emissions. The YSAQMD has been proactive in attempts to implement the most readily available, feasible, and cost-effective measures that can be employed to reduce emissions of PM.

Because the proposed project is located within the nonattainment area for State ozone and PM standards, the project would be subject to any requirements set forth in the 2016 Triennial Assessment and Plan Update or YSAQMD efforts related to PM emissions, as enforced by YSAQMD through rules and regulations.

City of Davis

In addition to the City's General Plan goals and policies, the City of Davis has various strategies for reducing the City's GHG emissions. In 1999, Davis joined a small group of cities calling for local action and a national policy on climate change. In 2006, the City joined the US Conference of Mayors Climate Protection Agreement that called for local and national action to reduce GHG emissions. In a follow-up action in spring 2007, the Davis City Council unanimously adopted a strategy to reduce the City's GHG emissions. Based on the City Council action, the City joined the *Cities for Climate Protection* (CCP) program along with hundreds of other communities across the globe to reduce GHG emissions at the local level. The program is designed to educate and empower local governments to take action on climate change. The CCP is a performance-oriented campaign that offers a framework for local governments to reduce greenhouse gas emissions and improve livability within their municipalities. As part of this effort, the City of Davis has undertaken various actions to reduce GHG emissions within the City of Davis, including the adoption of the *Davis Climate Action and Adaptation Plan*, as well as adoption of local GHG reduction targets, carbon budgets, and carbon allowances for residential land uses.

City of Davis General Plan

The following applicable goals related air quality and GHG emissions are from the Air Quality chapter of the City's General Plan.

Goal AIR 1. Maintain and strive to improve air quality.

[32] Yolo-Solano Air Quality Management District. *State Standards and Planning*. Available at: http://www.ysaqmd.org/planning/state.php. Accessed November 2016.

[33] Yolo-Solano Air Quality Management District. *Triennial Assessment and Plan Update*. April 2013. Available at: http://www.ysaqmd.org/documents/plans/Triennial%20Plan%202012%20DRAFT.pdf. Accessed November 2016.

Policy AIR 1.1 Take appropriate measures to meet the AQMD's goal for improved air quality.

In addition, the Transportation Element of the City's General Plan includes the following applicable goals, performance objectives, and policies related air quality and GHG emissions.

Goal #2 The Davis transportation system will evolve to improve air quality, reduce carbon emissions, and improve public health by encouraging usage of clean, energy-efficient, active (i.e. human powered), and economically sustainable means of travel.

Performance Objective #2.1 Reduce carbon emissions from the transportation sector by 61 percent by 2035.

Performance Objective #2.2 Reduce vehicle miles traveled (VMT) 39 percent by 2035.

Policy TRANS 1.5 Strive for carbon-neutrality or better from the transportation component of new residential development.

Policy TRANS 1.6 Reduce carbon emissions from the transportation system in Davis by encouraging the use of non-motorized and low carbon transportation modes.

Policy TRANS 1.7 Promote the use of electric vehicles and other low-polluting vehicles, including Neighborhood Electric Vehicles (NEV).

Policy TRANS 1.8 Develop and maintain a work trip-reduction program designed to reduce carbon emissions, criteria pollutants, and local traffic congestion.

Policy TRANS 3.3 Require new development to be designed to maximize transit potential.

Policy TRANS 4.4 Provide pedestrian and bicycle amenities.

Policy TRANS 4.5 Establish and implement bicycle parking standards for new developments and significant redevelopment.

Davis Climate Action and Adaptation Plan

The *Davis Climate Action and Adaptation Plan* (CAAP) is designed to place the community on a path to achieve the GHG emission reduction targets adopted by the City Council in November 2008. The targets were based on a range that uses the State of California targets as a minimum goal and deeper reductions as the desired outcome. The City adopted this range in recognition that emission reductions are not precise and that many scientists believe that a reduction of 80 percent below 1990 levels by 2050 may not be adequate. The City's GHG emission reduction targets per the CAAP are summarized in Table 4.2-6 below.[34]

Table 4.2-6
City of Davis and State GHG Reduction Targets

Year	Target Range[1]	
	State (City minimum target)	City of Davis (desired target)[2]
2010	2000 levels[3]	1990 levels
2020	1990 levels[4]	28% below 1990 levels
2030	40% below 1990 levels[5]	N/A
2040	N/A[6]	80% below 1990 levels
2050	80% below 1990 levels[7]	Carbon neutral[8]

Notes:
1 Davis anticipates to achieve reductions within the range of the State targets (minimum) and local targets (desired).
2 Due to residency time of GHGs in the atmosphere, early GHG reduction is generally more beneficial for mitigation of the most severe impacts of climate change.
3 EO S-03-05, June 1, 2005.
4 EO S-03-05, June 1, 2005, and AB 32, September 2006.
5 SB 32, September 08, 2016.
6 A formal State target for 2040 does not exist; however, an average reduction of 2.66 percent per year from 2020 to 2050 (assuming the State target of 1990 levels by 2020 has been met) would be required in order to achieve 80 percent below 1990 levels by 2050 (Davis CAAP, June, 2010).
7 EO S-03-05, June 1, 2005.
8 i.e., net zero GHG emissions.

Source: City of Davis. Staff Report: "Adoption Davis Climate Action and Adaptation Plan." June 1, 2010.

Preparation of the CAAP was guided by a community-based public input process executed by the Davis Climate Action Team, the Natural Resources Commission, and staff. Based on community input, analysis of best practices adopted by other communities, and contributions from subject matter experts, the plan utilizes a systems-based approach to address local GHG emissions. The plan identifies objectives and actions for the first five years after adoption in 2010 that were intended to reverse local GHG emission growth and establish a foundation for deeper, longer-term reductions beyond 2015. The plan includes objectives and actions in nine sectors, including: (1) Mobility; (2) Energy; (3) Land use and buildings; (4) Consumption and waste; (5) Food and agriculture; (6) Community engagement; (7) Government operations; (8) Advocacy; and (9) Climate change preparation (adaptation).

34 City of Davis. Staff Report: "*Adoption Davis Climate Action and Adaptation Plan*." June 1, 2010.

Adoption of the City CAAP addresses the City's goal of conserving natural resources and protecting the environment. Specifically, plan adoption implements the City Council's objective of addressing global warming and reducing the carbon footprint of Davis.

City of Davis Municipal Code

Section 8.01.090 of the Municipal Code requires mandatory compliance with Tier 1 standards of the CALGreen Code, which would otherwise be voluntary under the CBSC.

4.2.4 IMPACTS AND MITIGATION MEASURES

The standards of significance and methodology utilized to analyze and determine the proposed project's potential project-specific and cumulative impacts related to air quality and GHG emissions are described below. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Based on the recommendations of YSAQMD, City of Davis standards, and consistent with Appendix G of the CEQA Guidelines, the proposed project would result in a significant impact related to air quality and GHG emissions if the project would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people;
- Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to air quality;
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Further discussion of each of the above thresholds is provided below.

Criteria Pollutant Emissions and TAC Emissions

Table 4.2-7 below presents the YSAQMD's recommended thresholds of significance, which are expressed in tons per year (tons/yr) for ROG and NO_X and pounds per day (lbs/day) for PM_{10}.

Table 4.2-7 YSAQMD Thresholds of Significance		
Pollutant	**Construction Thresholds**	**Operational Thresholds**
ROG	10 tons/yr	10 tons/yr
NO_X	10 tons/yr	10 tons/yr
PM_{10}	80 lbs/day	80 lbs/day
Source: YSAQMD. Handbook for Assessing and Mitigating Air Quality Impacts. July 11, 2007.		

In addition to the thresholds of significance presented above for criteria air pollutants, YSAQMD has also developed thresholds for potential exposure of the public to TACs from new stationary sources. Exposure of the public to TACs from new stationary sources in excess of the following thresholds would be considered a significant impact:

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) equals to 10 in one million or more; and
- Ground-level concentrations of non-carcinogenic TACs would result in a Hazard Index equal to 1 for the MEI or greater.

Although the YSAQMD has established thresholds for exposure to TACs from new stationary sources, a threshold for exposure of the public to mobile TAC emissions does not currently exist. In the absence of a specified threshold for assessing impacts of mobile sources of TACs on a sensitive land use, the industry standard is to use the stationary source threshold of an increase in cancer risks of 10 in one million and a Hazard Index greater than 1, which is the standard that has been used throughout the State for similar health risk analyses. The nearby Sacramento Metropolitan Air Quality Management District (SMAQMD) and Bay Area Air Quality Management District (BAAQMD) also recommend the industry standard thresholds of an increased cancer risk of 10 in one million and a Hazard Index greater than 1 for project-level TAC impacts. Off-road construction equipment used during project-related construction activities would be considered a potential mobile source of TAC emissions. Accordingly, the City, as lead agency has selected to use the YSAQMD's stationary source TAC emissions thresholds listed above for the purposes of determining cancer risk of exposing sensitive receptors to construction-related mobile source TAC emissions.

The CARB Handbook provides recommendations for siting new sensitive land uses near existing sources typically associated with significant levels of TAC emissions. However, the California Supreme Court decision in the case of *California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369* clarified that CEQA does not require lead agencies to analyze the impact of existing environmental conditions on a project's future users or residents unless the project will exacerbate the existing environmental hazards or conditions. This limits the CEQA analysis of impacts from existing sources that emit odors and TACs on new receptors from a proposed development project, unless the situation is specifically required to be analyzed by statute (such as a school). While existing sources that emit odors and TACs may not be considered a CEQA impact, local jurisdictions have the authority to protect the public health,

safety, and welfare of their communities through their police powers.[35] While not required pursuant to CEQA, in order to address potential public health impacts, the nearby SMAQMD is currently recommending that proposed developments that could expose receptors to existing sources that emit odors and TACs be analyzed and exposure reduced as part of the lead agency's planning process instead. Similarly, the City of Davis, as lead agency, has chosen to prepare a full health risk assessment to evaluate the health risks posed to future residents as a result of the project site's proximity to ongoing railroad and freeway operations. Detailed analysis and modeling results related to DPM emissions from the nearby railroad and I-80 operations are included as Appendix D to this EIR.

The YSAQMD recommends the use of screening thresholds to assess a project's potential to create an impact through the creation of CO hotspots. A violation of the CO standard could occur if either of the following criteria is true of any street or intersection affected by the mitigated project:[36]

- The project would reduce peak-hour level of service (LOS) on one or more streets or at one or more intersections to an unacceptable LOS (typically LOS E or F); or
- The project would increase a traffic delay by 10 or more seconds on one or more streets or at one or more intersections in the project vicinity where a peak hour LOS of F currently exists.

If either or both of the above criteria are met by the mitigated project, YSAQMD recommends performing a full CO Protocol Analysis. If the results of the CO Protocol Analysis indicate a potential impact related to CO could occur, such as in instances where a project would worsen operations at a signalized intersection operating at LOS E or LOS F, YSAQMD directs Lead Agencies to perform CO dispersion modeling analysis using a modeling program such as CALINE-4. The CALINE-4 dispersion model can estimate local CO concentrations at intersections based on traffic estimates and lane configurations. Once the CO concentrations at affected intersections are estimated, the CO concentration must then be compared to the one hour and eight hour AAQS for CO. If the local CO concentration estimated using CALINE-4 exceeds either the one or eight hour AAQS for the affected intersection, then a significant impact would result; however, if the localized CO concentrations are shown to be below the applicable AAQS, the project would not result in an impact related to localized CO concentrations.

GHG Emissions

With respect to establishing significance thresholds for GHG emissions, CEQA Guidelines Section 15064.4 states:

> (a) The determination of the significance of GHG emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency

[35] California Constitution, Article XI, Section 7. Available at: http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=CONS&sectionNum=SEC.%207.&article=XI. Accessed February 2017.

[36] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts* [p. 21]. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed April 2017.

should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project.

(b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:
  (1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
  (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
  (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Thus, one threshold that is commonly used to analyze a project's GHG emissions is whether the project would conflict with or obstruct the goals, strategies, or governing regulation (Health & Safety Code, § 38500-38599) of the California Global Warming Solutions Act of 2006 (AB 32) or the GHG reduction targets in SB 32.

The YSAQMD, in their *Handbook for Assessing and Mitigating Air Quality Impacts*, acknowledges that new emissions generated by development projects could potentially conflict with existing GHG emissions reductions targets, and thus, a need for development of GHG emissions thresholds exists. However, the YSAQMD has not yet established or adopted any such thresholds. The YSAQMD is currently recommending GHG analysis consistent with the SMAQMD adopted thresholds of significance. While SMAQMD recognizes that emissions from a single project cannot be determined to substantially impact overall GHG emissions levels in the atmosphere, an emissions threshold is useful to trigger further project review and assess mitigation. As such, SMAQMD designed emissions thresholds to ensure that 90 percent of new GHG emissions related to land use projects would be reviewed and assessed for mitigation. Thus, projects exceeding SMAQMD's thresholds would constitute the vast majority of GHG emissions, and exceedance of the thresholds would allow for further project review contributing to the emissions reductions goals of AB 32, SB 32, the Scoping Plan, and relevant Executive Orders. SMAQMD has established a threshold for both construction and operational GHG emissions of 1,100 $MTCO_2e$/yr. It should be noted that the nearby Placer County Air Pollution Control District has independently adopted an operational threshold of 1,100 $MTCO_2e$/yr, for use in project GHG analysis, while the El Dorado County Air Pollution Control District similarly recommends use of SMAQMD's 1,100 $MTCO_2e$/yr threshold.

The 2008 document, *City of Davis Greenhouse Gas Emissions Inventory & Forecast Update*, includes an estimation of citywide 2010 emissions levels, which form the basis of the City's GHG

reduction target thresholds.[37] The 2010 emissions levels were then used to generate emissions reduction targets, which were adopted by the City on November 18, 2008. The emissions reductions goals provide a desired rate of reduction, which is more ambitious than AB 32 or SB 32, and includes achievement of citywide carbon neutrality by 2050. In addition to the aggressive, desired reduction targets, the City also adopted minimum reduction targets equal to the State mandated reductions levels. By adopting two reductions targets, the City created a range of acceptable emissions reductions level, where the minimum reductions target would achieve statewide reductions goals based on AB 32, while the desired reduction level would surpass the state minimum. The reductions targets adopted by the City are presented in Table 4.2-8.

Table 4.2-8
Davis GHG Reduction Targets

Target Year	Target Range	
	State Target	City of Davis Target
2010	2000 Levels	1990 levels
2012	1998 Levels	7% below 1990 levels
2015	1995 Levels	15% below 1990 levels
2015 – 2020	Average Annual Reduction	Average of 2.6% reduction per year to achieve 80% between 1990 levels by 2040
2020	1990 Levels	28% below 1990 levels
2020 – 2040	No formal target, but must reduce an average of 2.66% per year to achieve 80% below 1990 levels by 2050	Average of 2.6% per year to achieve 80% below 1990 levels
2050	80% below 1990 levels	Carbon Neutral

Source: Davis City Council. Resolution No. 08-166, Series 2008: Resolution Adopting Greenhouse Gas Reduction Targets for the City of Davis (City Operations and Community). November 18, 2008.

To ensure that new developments within the City would not impede the City's progress towards the emissions reductions targets presented in Table 4.2-8 above, the City identified carbon allowances for new developments. The carbon allowances set a maximum emissions level for the operation of new developments,[38] while maintaining the City's emissions reductions goals.[39]

Based on the report prepared by Deb Niemeier (Ph.D., P.E, Director John Muir Institute of the Environment, UC Davis), staff developed Table 4.2-9 below, showing the average baseline GHG "allowance" for each Davis resident, and by extension, each Davis household. The methodology behind the summary table uses peer reviewed state wide GHG emission totals broken down to the local level and factors in regional growth assumptions and foreseeable statewide initiatives designed to reduce GHG emissions (e.g. low carbon fuel standard). Using the adopted City GHG targets (and State targets), staff has calculated the allowances for key target years. This table forms the basis for establishing GHG emissions standards for new residential development projects.[40]

---

37 City of Davis Department of Community Development and Sustainability. *City of Davis Greenhouse Gas Emissions Inventory & Forecast Update*. June 2008.

38 City of Davis. *Staff Report: Adoption Davis Climate Action and Adaptation Plan*. June 2, 2010.

39 Niemeier, Deb. *Carbon Development Allowances.* September 2008.

40 City of Davis. Staff Report: GHG Emissions Thresholds and Standards for New Residential Development. April 21, 2009.

The proposed structure is anticipated to operate at a density of 5.46 persons per dwelling unit. The City's carbon allowances, presented in Table 4.2-9 below, assumes a citywide resident density of 2.5 persons per dwelling unit. Because the proposed project would be more dense than the City average, the per person carbon allowance is deemed a more appropriate threshold to use for the proposed project than the per unit allowance. The proposed project is assumed to be operational by the year 2019; therefore, the per person carbon allowance for the year 2020 would apply to the proposed project. The carbon allowance for the year 2020 requires the project to achieve emissions rates at least as low as 3.7 $MTCO_2e$ per year per resident with a desired emissions level of 2.7 $MTCO_2e$ per year per resident. Therefore, the proposed project would be considered to conflict with the City's GHG reduction targets and CAAP, if the project would result in operational GHG emissions in excess of 3.7 $MTCO_2e$ per year per resident.

Table 4.2-9
Carbon Allowances for New Residential Developments

Target Year Minimum/Desired	Target	Carbon Allowance[1]		
		Per Unit ($MTCO_2e$/yr)	Per Person ($MTCO_2e$/yr)	Percent Reduction Over Existing (%)
Existing/Base Year (2010)	N/A	16.5	6.6	0
2012 (Minimum)	1998 level	15.0	6.0	9
2012 (Desired)	7% below 1990	8.6	3.4	48
2020 (Minimum)	1990 level	9.25	3.7	44
2020 (Desired)	28% below 1990	6.7	2.7	59
2030 (Minimum)	28% below 1990	6.7	2.7	59
2030 (Desired)	53% below 1990	4.35	1.75	74
2040 (Minimum)	53% below 1990	4.35	1.75	74
2040 (Desired)	80% below 1990	1.85	0.75	89
2050 (Minimum)	80% below 1990	1.85	0.75	89
2050 (Desired)	Carbon Neutral	Net 0		100

Notes:
1. Assumes 2.5 persons/dwelling unit and an annual growth rate of 1% per year

Source: Niemeier, Deb. Carbon Development Allowances. September 2008.

For the purposes of this analysis, the CEQA Guidelines Appendix G thresholds are utilized for the GHG significance determination, with the understanding that these general thresholds are to be understood within the context of the YSAQMD and the City of Davis. The Appendix G thresholds are as follows:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs;

With respect to the first threshold, the potential regional impacts and YSAQMD/SMAQMD thresholds will be considered. With respect to the second threshold, the project's potential to conflict with an applicable plan, policy or regulation related to reducing emissions of GHGs will be analyzed in relation to the most applicable local regulations, which is the City of Davis' CAAP, and the specific GHG thresholds presented in Table 4.2-9 above.

It should be noted that the proposed project is consistent with SACOG's Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) and is eligible for CEQA streamlining. One benefit of the CEQA streamlining process is that projects that are consistent with the MTP/SCS do not have to consider project specific or cumulative impacts involving vehicle emissions related to the project on global warming.[41] Therefore, the EIR for the proposed project is not required to include analysis of mobile source GHG emissions in regards to either the City of Davis' standards or the YSAQMD/SMAQMD standards. Nevertheless, in order to provide a conservative analysis of the proposed project, the City has decided not to take advantage of the vehicle GHG emissions portion of the CEQA streamlining process, and has included analysis of mobile source emissions in regard to the project specific and cumulative GHG analysis.

Method of Analysis

The analysis protocol and guidance provided by the YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* was used to analyze the proposed project's air quality impacts, including screening criteria and pollutant thresholds of significance. Furthermore, guidance from YSAQMD, SMAQMD, and the City of Davis was used to analyze the proposed project's GHG emissions. Details regarding the methodology and assumptions used for the proposed project's air quality and GHG impact analysis are provided below.

Construction Emissions

The proposed project's short-term construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2016.3.1 software - a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the ITE Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data was input into the model. Based on information provided by the project applicant and the project engineer, the following assumptions were made for the project construction modeling:

- Construction was assumed to commence in July 2017 and would occur over approximately 18 months;
- 18,200 sf of on-site existing structures would be demolished;
- An estimated 1,149 cubic yards of material would be exported during the site preparation phase associated with tree removal;

[41] Sacramento Area Council of Governments. *SB 375 CEQA Streamlining*. Available at http://www.sacog.org/sb-375-ceqa-streamlining. Accessed February 2017.

- An estimated 1,000 cubic yards of material would be imported during the grading phase associated with fill soil; and
- A total of 5.92 acres would be disturbed during the grading phase.

The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. All CalEEMod modeling results are included in Appendix E to this EIR.

Construction-Related DPM Emissions

The $PM_{2.5}$ (assumed to be all DPM) concentration associated with the proposed project's short-term construction activities at the maximally exposed sensitive receptor nearest to the site has been estimated using the American Meteorological Society/Environmental Protection Agency (AMS/EPA) Regulatory Model (AERMOD) dispersion model. The associated cancer risk and non-cancer hazard index were calculated using the CARB's Hotspot Analysis Reporting Program Version 2 (HARP 2) Risk Assessment Standalone Tool (RAST), which calculates the cancer and non-cancer health impacts using the risk assessment guidelines of the 2015 Office of Environmental Health Hazard Assessment (OEHHA) Guidance Manual for Preparation of Health Risk Assessments.[42] The modeling was performed in accordance with the USEPA's User's Guide for the AMS/EPA Regulatory Model – AERMOD and the 2015 OEHHA Guidance Manual.

The average annual unmitigated construction exhaust $PM_{2.5}$ emissions from the proposed project's CalEEMod results were used to calculate the emission rate applied in AERMOD. Construction activities were assumed to occur seven days per week and restricted to the hours between 7:00 AM and 7:00 PM Monday through Friday and between the hours of 8:00 AM and 8:00 PM Saturdays and Sundays per Chapter 24 of the City's Municipal Code, Noise Regulations. The construction exhaust emissions were modeled in AERMOD as a series of volume sources located throughout the site where improvements are proposed. A receptor grid using flagpole receptors was applied to AERMOD at the surrounding sensitive receptor locations (i.e., the Old East Davis neighborhood to the north, the residential developments along the southern side of Olive Drive, the residence to remain on the northeast corner of Hickory Lane and Olive Drive, and Slatter's Court). The AERMOD analysis relied on data from the nearest meteorological station to the proposed project site, which is located at the Sacramento International Airport, approximately 11.80 miles northeast of the project site.

The maximum annual average and maximum one-hour average concentrations from AERMOD were applied to HARP 2 RAST to calculate the cancer risk and non-cancer hazard index, respectively, to the maximally exposed resident in the area surrounding the project site. The 2015 OEHHA Guidance Manual recommends that the exposure period for short-term projects (i.e., construction activities) lasting more than six months be evaluated for the duration of the project. Construction activities related to the proposed project are assumed to occur over 18 months. However, due to limitations within the HARP 2 RAST model, the construction period was conservatively assumed to occur over two years, and the exposure duration for the maximally

[42] Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments* [pg. 8-18]. February 2015.

exposed resident was assumed to be three years, with exposure conservatively assumed to occur for 365 days per year. The 2015 OEHHA Guidance Manual recommends that the fraction of time spent at home be used for a residential receptor based on the assumption that exposure at nearby residences is not occurring away from home. The moderate intensity eight-hour breathing rates option within the CARB's HARP 2 RAST was applied for the nearby residents, per the 2015 OEHHA Guidance Manual, in order to reflect that exposures would only occur during the limited hours of construction.

The resultant cancer and non-cancer health risks associated with construction-related DPM emissions were compared to the standards of significance discussed above in order to determine the associated level of impact. The AERMOD and HARP 2 RAST modeling results are included in Appendix F to this EIR.

Operational Emissions

The proposed project's operational emissions of criteria pollutants and GHGs were estimated using CalEEMod. Based on the construction information provided by the project applicant, the proposed project is anticipated to be fully operational by 2019. The modeling performed for the proposed project included compliance with YSAQMD rules and regulations (i.e., low-VOC [volatile organic compounds] paints and low-VOC cleaning supplies). All buildings within the State of California are required to comply with the mandatory standards within the currently effective CALGreen Code and California Building Energy Efficiency Standards Code. In addition, as discussed above, because the City adopted voluntary Tier 1 provisions for previous versions of the CALGreen Code, the City's adoption of the Tier 1 provisions of the 2016 CALGreen Code has been assumed for analysis purposes within this EIR. The project's compliance with the Tier 1 provisions would result in a 30 percent reduction in indoor water use. The proposed project would also include drought tolerant plantings and efficient irrigation systems to achieve a 50 percent reduction in outdoor water use. Reducing indoor and outdoor water use would result in an indirect reduction in GHG emissions, as the acquisition and delivery of water results in emissions associated with energy use. In addition, adherence to the California Building Energy Efficiency Standards Code would reduce the energy demand that would otherwise occur due to operation of the proposed project, thus, directly reducing energy demand and, as a result, reducing energy-related GHG emissions. The proposed project's compliance with the California Building Energy Efficiency Standards Code and CALGreen Code would be verified as part of the City's building approval review process.

The project-specific trip generation and vehicle miles travelled (VMT) data provided by Fehr & Peers, Inc. for full buildout of the proposed project was also applied to the project modeling.[43] According to Section 4.11, Transportation and Circulation, of this EIR, the project-specific average daily trip rate was used in combination with the Davis Travel Demand Model network, and the SACMET Regional Travel Model to estimate project-specific operational VMT. Combining the project-specific trip generation and VMT estimation allowed for a more accurate estimation of the transportation-related emissions that would result from implementation and operation of the proposed project.

[43] Fehr & Peers. *Memorandum: Lincoln40 Apartments EIR Project Vehicle Trip Generation, Mode Split, and Distribution Analysis*. November 14, 2016.

The existing residential developments at the project site currently contribute vehicle trips to the area, and such trips would continue to occur in the absence of the proposed project. According to CEQA Guidelines Section 15064.4(b), the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting should be considered when assessing the significance of impacts from GHG emissions on the environment. As such, after calculating the vehicle trip generation and VMT information for buildout of the proposed project, Fehr & Peers, Inc. applied a credit to the proposed project for the residential trip generation and VMT that currently occurs associated with the existing residential developments. Therefore, the mobile emissions discussed throughout this section of the EIR reflect the net new emissions, or the emissions caused specifically by the proposed project's increase in vehicle use at the project site.

The results of emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. All CalEEMod modeling results are included in Appendix E to this EIR.

Project-Specific Impacts and Mitigation Measures

The following discussion of air quality and GHG emissions impacts are based on implementation of the proposed project in comparison to existing conditions and the standards of significance presented above.

4.2-1 Violate any air quality standard or contribute substantially to an existing or projected air quality violation during construction. Based on the analysis below, the impact is *less than significant.*

During construction of the proposed project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction workers' commute, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes PM_{10} and $PM_{2.5}$ emissions.

The proposed project's maximum unmitigated construction emissions have been estimated using CalEEMod. The construction modeling assumptions are described in the Method of Analysis section above. The proposed project's estimated construction-related emissions are presented in Table 4.2-10. As shown in the table, the proposed project's maximum unmitigated construction-related emissions would be below the applicable thresholds of significance. Therefore, the proposed project's construction-related emissions would not result in a contribution to the region's nonattainment status of ozone or PM, and would not violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Table 4.2-10 Maximum Unmitigated Project Construction-Related Emissions		
Pollutant	**Project Emissions**	**YSAQMD Threshold of Significance**
ROG	1.70 tons/yr	10 tons/yr
NO_X	3.60 tons/yr	10 tons/yr
PM_{10}	21.40 lbs/day	80 lbs/day
Source: CalEEMod, February 2017 (see Appendix E).		

All projects within the YSAQMD, including the proposed project, are required to comply with all YSAQMD rules and regulations for construction, including Rule 2.1 (Control of Emissions), Rule 2.28 (Cutback and Emulsified Asphalts), Rule 2.5 (Nuisance), Rule 2.14 (Architectural Coatings), and Rule 2.11 (Particulate Matter Concentration). The aforementioned rules and regulations are not readily applicable in CalEEMod and are, therefore, not included in the project-specific modeling. Because compliance with the rules and regulations would likely result in some additional reduction in emissions, the proposed project construction emissions would likely be slightly reduced from what is presented in Table 4.2-10 with compliance with the rules and regulations. In addition, YSAQMD encourages all projects to implement best management practices to reduce dust emissions and avoid localized health impacts. The YSAQMD's best management practices for dust could include, but are not be limited to, the following:

- Watering of all active construction sites at least twice daily;
- Maintenance of at least two feet of freeboard in haul trucks;
- Covering of all trucks hauling dirt, sand, or loose materials;
- Application of non-toxic binders to exposed areas after cut and fill operations and hydroseeding of area, as applicable and/or necessary;
- Application of chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days), as applicable and/or necessary;
- Planting of vegetative ground cover in disturbed areas as soon as possible;
- Covering of inactive storage piles;
- Sweeping of streets if visible soil material is carried out from the construction site;
- Treatment of accesses to distance of 100 feet from the paved road with a six- to 12-inch layer of wood chips or mulch; and
- Treatment of accesses to a distance of 100 feet from the paved road with a six-inch layer of gravel.

Compliance with the aforementioned rules and regulations related to construction, as well as implementation of best management practices for dust, would help to minimize emissions generated during construction activities.

Conclusion

Because the proposed project would result in construction-related emissions below the applicable thresholds of significance and would comply with applicable YSAQMD rules,

regulations, and best management practices for dust, construction activities associated with development of the proposed project would result in a ***less-than-significant*** impact to air quality.

Mitigation Measure(s)
None required.

4.2-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation during operations, and a conflict with or obstruction of implementation of applicable air quality plans. Based on the analysis below, the impact is *less than significant.*

Operational emissions of criteria pollutants would be generated by the proposed project from both mobile and stationary sources. Day-to-day activities, such as future resident vehicle trips to and from the project site, would make up the majority of the mobile emissions. Emissions would also occur from area sources such as architectural coatings, landscape maintenance equipment exhaust, and consumer products (e.g., deodorants, detergents, hair spray, cleaning products, spray paint, insecticides, floor finishes, polishes, etc.).

As discussed above, due to the nonattainment designations of the area, YSAQMD has developed plans to attain the State and federal standards for ozone and particulate matter. The plans include the 2013 Ozone Attainment Plan, the $PM_{2.5}$ Implementation/Maintenance Plan, and the 2012 Triennial Assessment and Plan Update. Adopted YSAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. Thus, by exceeding the YSAQMD's mass emission thresholds for operational emissions of ROG, NO_X, or PM_{10}, a project would be considered to conflict with or obstruct implementation of the YSAQMD's air quality planning efforts.

The proposed project's maximum unmitigated operational emissions have been estimated using CalEEMod. As discussed in the Method of Analysis section above, the project-specific VMT data provided by Fehr & Peers, Inc. was applied to CalEEMod, as well as the project's required compliance with Tier 1 of the CALGreen Code and exceedance of the 2016 Building Energy Efficiency Standards. The resultant emissions estimated for operation of the proposed project are presented in Table 4.2-11.

Table 4.2-11
Maximum Unmitigated Project Operational Emissions

Pollutant	Project Emissions	YSAQMD Thresholds of Significance
ROG	1.32 tons/yr	10 tons/yr
NO_X	1.49 tons/yr	10 tons/yr
PM_{10}	1.95 lbs/day	80 lbs/day

Source: CalEEMod, February 2017 (see Appendix E).

As shown in the table above, the proposed project's maximum unmitigated operational emissions of ROG, NO_X, and PM_{10} would be below the applicable YSAQMD thresholds of significance. Accordingly, the proposed project would not violate an air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the proposed project would be considered to result in a ***less-than-significant*** impact related to air quality.

Mitigation Measure(s)
None Required.

4.2-3 Expose sensitive receptors to substantial pollutant concentrations. Based on the analysis below and with the implementation of mitigation, the impact is *less than significant.*

The major pollutants of concern are localized CO emissions and TAC emissions, which are addressed separately in detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Implementation of the proposed project would increase traffic volumes on streets near the project site; therefore, the project would be expected to increase local CO concentrations. Concentrations of CO approaching the ambient air quality standards are only expected where background levels are high, and traffic congestion levels are high. The YSAQMD's preliminary screening methodology for localized CO emissions provides a conservative indication of whether project-generated vehicle trips would result in the generation of CO emissions that would contribute to an exceedance of AAQS. Per the YSAQMD screening methodology, if either of the following results at any street or intersection affected by a project, after implementation of mitigation,[44] the project has the potential to result in localized CO emissions that could violate CO standards:

- The project would reduce peak-hour level of service (LOS) on one or more streets or at one or more intersections to an unacceptable LOS (typically LOS E or F); or
- The project would increase a traffic delay by 10 or more seconds on one or more streets or at one or more intersections in the project vicinity where a peak hour LOS of F currently exists.

As discussed in Section 4.11 of this EIR, Transportation and Circulation, the proposed project would have the potential to result in the degradation of intersection operations in the unmitigated Cumulative Scenario. However, Section 4.11 includes mitigation measures that would be sufficient to ensure that the proposed project would not affect any

[44] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts* [p. 21]. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed April 2017.

intersections in exceedance of the above thresholds. As stated in the YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts*, CO impacts from a proposed project only warrant further analysis where such impacts would occur after the implementation of mitigation.[45] The mitigation measures included in Section 4.11 are sufficient to ensure that the proposed project would not result in the degradation of traffic intersection operations that would exceed YSAQMD's CO criterion in the mitigated project scenario. Therefore, considering implementation of all relevant mitigation measures included in Section 4.11 of this EIR, the increase in traffic related to buildout of the proposed project would not result in excess CO emissions under existing or cumulative traffic conditions.

Consequently, the proposed project is not be expected to generate localized CO emissions that would contribute to an exceedance of AAQS nor would the project expose sensitive receptors to substantial concentrations of localized CO.

TAC Emissions

The proposed project would be located near existing sources of TAC emissions, and project construction and operation could involve new emissions of TACs. Potential sources of TAC emissions associated with the proposed project are further addressed below.

Existing Sources of TAC Emissions

Nearby existing sources of TAC emissions would include I-80 and the railroad tracks to the north. Current operations along I-80 and the railroad tracks involves TAC emissions, particularly DPM emissions and UFP emissions from the use of diesel-powered and gasoline powered engines. The proposed project would not alter the existing operations associated with I-80 or the railroad tracks; rather, the proposed project would involve siting new residential units in proximity to the aforementioned existing sources of emissions. As discussed previously, the recent California Supreme Court decision in the case of *California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369* clarified that the CEQA does not require lead agencies to analyze the impact of existing environmental conditions on a project's future users or residents unless the project would exacerbate the existing environmental hazards or conditions. The proposed project would not exacerbate the existing emissions associated with I-80 or railroad operations. Thus, the analysis of TACs from existing sources is outside of the scope of CEQA and is not included in this section of the EIR. However, the City, as lead agency, has elected to conduct an analysis of the existing sources of TACs on future residents of the proposed project. The analysis is included as Appendix D to this EIR.

[45] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts* [p. 21]. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed April 2017.

New Sources of TAC Emissions

The CARB Handbook provides recommendations on siting new sources of TACs near existing sensitive receptors. Operational-related emissions of TACs are typically associated with stationary diesel engines or land uses that involve heavy truck traffic or idling. The residential development proposed as part of the project would not involve long-term operation of any stationary diesel engines or other major on-site stationary source of TACs. The CARB's Handbook includes facilities (distribution centers) associated with 100 or more heavy-duty diesel trucks per day as a source of substantial DPM emissions. The project is not a distribution center, and is not located near any existing distribution centers. Residential developments do not involve frequent heavy-duty diesel truck trips. The proposed project is student-oriented, and residents would be encouraged to use alternative modes of transportation through reduced vehicle parking, the inclusion of bike parking, and close proximity to UC Davis and the Davis downtown area. Despite the encouragement to use alternative modes of transportation, many of the future residents could be expected to own and use personal vehicles. Some of the future residents may own diesel-fueled vehicles; however, emissions from passenger vehicles are typically less intense than from heavy-duty trucks, and the likelihood that the equivalent of 100 heavy-duty diesel trucks per day would occur from diesel-fueled passenger vehicles to and from the site is very low. Accordingly, the proposed project would not involve diesel trucks at the site in excess of 100 per day and would not be expected to expose any existing sensitive receptors to substantial DPM emissions associated with truck trips. Therefore, operation of the proposed project would not expose existing nearby sensitive receptors to substantial pollutant concentrations.

Construction-related activities have the potential to generate concentrations of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. However, construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. While methodologies for conducting health risk assessments are associated with long-term exposure periods (e.g., over a 30-year period), construction activities associated with the proposed project would occur over an approximately 18-month period. Nonetheless, given the project's proximity to existing sensitive receptors, the proposed project's potential impacts on nearby sensitive receptors associated with DPM from construction activities at the project site has been evaluated. Details regarding the construction DPM analysis assumptions are described in the Method of Analysis section above. As described, the increase in cancer risk and non-cancer hazard index was calculated for the maximally exposed nearby resident.

Based on the construction DPM modeling results, the proposed project would result in increases in cancer risk and non-cancer hazard index at the maximally exposed resident as shown in Table 4.2-12 below.

Table 4.2-12 Maximum Cancer Risk and Hazard Index Associated With Project Construction DPM		
	Cancer Risk (per million persons)	**Non-Cancer Hazard Index**
At Maximally Exposed Receptor	61.6	0.04
Thresholds of Significance	*10*	*1.0*
Exceed Thresholds?	**YES**	**NO**
Sources: CalEEMod, AERMOD, and HARP 2 RAST, January 2017 (see Appendix E and Appendix F).		

As shown in Table 4.2-12, the proposed project would result in a hazard index below the applicable YSAQMD threshold of significance. However, the anticipated concentration of DPM due to construction of the proposed project would result in an increased risk of cancer of 61.6 cases per one million persons at the maximally exposed receptor. As a result, the proposed project would exceed the YSAQMD's recommended threshold for increased cancer risk being used for this analysis. Thus, a potentially significant impact related to TAC emissions would occur during construction.

Conclusion

Based on the above analysis, the operation of the proposed residential land uses would not be anticipated to result in the production of substantial concentrations of DPM or localized CO that would expose sensitive receptors to substantial pollutant concentrations. However, construction activities related to the proposed project would have the potential to result in DPM concentrations that could result in an increased cancer risk for nearby residents in excess of the applicable threshold of significance. Therefore, the proposed project would have the potential to result in the exposure of sensitive receptors to substantial concentrations of DPM, and a ***significant*** impact would result.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the construction-related exhaust emissions of $PM_{2.5}$ as shown in Table 4.2-13.[46] Because emissions of $PM_{2.5}$ are a metric for DPM emissions, and DPM emissions are the TAC of concern, by reducing $PM_{2.5}$ emissions to the levels presented in Table 4.2-13, the mitigation below would reduce the anticipated DPM concentration and the associated cancer risk at the maximally exposed receptor.[47]

[46] Environmental Protection Agency of New South Wales. *Reducing Emissions from Non-road Diesel Engines* [pg. 16]. Available at http://www.epa.nsw.gov.au/resources/air/140586NonrdDiesInfoRpt.pdf. Accessed May 26, 2017.

[47] California Environmental Protection Agency. *Overview: Diesel Exhaust and Health*. Available at: https://www.arb.ca.gov/research/diesel/diesel-health.htm. Accessed February 2017.

Table 4.2-13 Construction Exhaust $PM_{2.5}$ Emissions		
Year	**Unmitigated (Tons/yr)**	**Mitigated[1] (Tons/yr)**
2017	0.1171	0.0039
2018	0.2059	0.0081
2019	0.0291	0.0013

[1] The use of EPA Tier 4 engines was applied to all construction equipment used on the project site in this modeling scenario. Tier 4 engines reduce the amount of PM emissions, including DPM, from equipment.

Source: CalEEMod, February 2017 (Appendix E)

With implementation of the following mitigation measure, the cancer risk at the maximally exposed receptor associated with the proposed project's construction activity would be reduced from an increase of 61.6 cases in one million persons to an increase of 2.33 cases in one million persons, which would be below the applicable threshold of significance of an increase of 10 cases in one million persons. Therefore, implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.2-3 *Prior to approval of any grading plans, the project applicant shall show on the plans via notation that the contractor shall ensure that all diesel-powered equipment (e.g., rubber-tired dozers, scrapers, cranes, etc.) to be used in the construction of the project (including owned, leased, and subcontractor vehicles) shall, at a minimum, meet USEPA emissions standards for Tier 4 engines or equivalent. The plans shall be submitted for review and approval to the Department of Community Development and Sustainability.*

4.2-4 Create objectionable odors affecting a substantial number of people. Based on the analysis below, the impact is *less than significant.*

As discussed above, due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantitative methodologies to determine the presence of a significant odor impact do not exist. According to the YSAQMD, common types of facilities that are known to produce odors include, but are not limited to, wastewater treatment facilities, chemical or fiberglass manufacturing, landfills, composting facilities, food processing facilities, refineries, dairies, and asphalt or rending plants.[48]

The proposed project would include 130 residential units. Residential land uses are not typically associated with the creation of substantial objectionable odors. As a result, the proposed project operations would not create any objectionable odors that would affect a substantial number of people.

[48] Yolo-Solano Air Quality Management District. *Handbook for Assessing and Mitigating Air Quality Impacts* [pg. 14]. July 11, 2007. Available at: http://www.ysaqmd.org/documents/CEQAHandbook2007.pdf. Accessed February 2015.

Diesel fumes from construction equipment are often found to be objectionable; however, construction is temporary and construction equipment would operate intermittently throughout the course of a day, would be restricted to daytime hours per Chapter 24 of the City's Municipal Code, and would likely only occur over portions of the improvement area at a time. In addition, all construction equipment and operation thereof would be regulated per the In-Use Off-Road Diesel Vehicle Regulation. Project construction would also be required to comply with all applicable YSAQMD rules and regulations, particularly associated with permitting of air pollutant sources. The aforementioned regulations would help to minimize air pollutant emissions as well as any associated odors. Considering the short-term nature of construction activities, as well as the regulated and intermittent nature of the operation of construction equipment, construction of the proposed project would not be expected to create objectionable odors affecting a substantial number of people.

The YSAQMD regulates objectionable odors through Rule 2.5 (Nuisance), which prohibits any person or source from emitting air contaminants or other material that result in any of the following: cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; endanger the comfort, repose, health, or safety of any such persons or the public; or have a natural tendency to cause injury or damage to business or property. Rule 2.5 is enforced based on complaints. If complaints are received, the YSAQMD is required to investigate the complaint, as well as determine and ensure a solution for the source of the complaint, which could include operational modifications. Thus, although not anticipated, if odor complaints are made, the YSAQMD would ensure that such odors are addressed and any potential odor effects reduced to less than significant.

For the aforementioned reasons, construction and operation of the proposed project would not create objectionable odors that would affect a substantial number of people, and a ***less-than-significant*** impact related to objectionable odors would result.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

A project's criteria pollutant emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. The geographic context for the proposed project's cumulative air quality analysis includes the City of Davis and surrounding areas within the SVAB.

Global climate change is, by nature, a cumulative impact. Emissions of GHG contribute, on a cumulative basis, to the adverse environmental effects of global climate change (e.g., sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts). A single project could not generate enough GHG emissions to contribute noticeably to a change in the global average temperature. However, the combination of GHG emissions from a project in combination with other past, present, and future projects could contribute substantially to the world-wide phenomenon of global climate change and the associated environmental impacts. Although the geographical context for global climate change is the Earth, for analysis purposes under CEQA, and due to the regulatory context pertaining to GHG emissions and global climate change applicable to the proposed project, the geographical context for global climate change in this EIR is limited to the State of California.

4.2-5 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). Based on the analysis below, the project's contribution to this significant cumulative impact is *less than cumulatively considerable*.

The proposed project is within an area currently designated as nonattainment for Ozone, PM_{10}, and $PM_{2.5}$. By nature, air pollution is largely a cumulative impact. Thus, the proposed project, in combination with other proposed and pending projects in the region would significantly contribute to air quality effects within the SVAB, resulting in an overall significant cumulative impact. However, any single project is not sufficient enough in size to, alone, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's incremental impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, YSAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds that project's emissions would be cumulatively considerable, resulting in a significant adverse air quality impact to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

The proposed project would result in construction-related and operational emissions below YSAQMD's thresholds of significance, as discussed under Impacts 4.2-1 and 4.2-2. As discussed previously, the proposed project would be considered to be consistent with SACOG's MTP/SCS. The MTP/SCS integrates land use and transportation planning to achieve improvements in air quality through a reduction in the use of single-passenger

vehicles. Thus, the proposed project would result in operational emissions below YSAQMD's thresholds, while also contributing to regional air quality emission reductions related to implementation of the MTP/SCS. Therefore, the proposed project's incremental contribution to cumulative regional air quality impacts would be ***less than cumulatively considerable***.

Mitigation Measure(s)
None required.

4.2-6 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Based on the analysis below, the impact is *less than cumulatively considerable.*

An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

The proposed project, in combination with other proposed and pending projects in the region would significantly contribute to the State of California GHG emissions and effects of global climate change, resulting in an overall significant cumulative impact. Implementation of the proposed project would contribute to the cumulative increase in GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 and, to a lesser extent, other GHG pollutants, such as CH_4 and N_2O. Sources of GHG emissions include area sources, mobile sources or vehicles, utilities (electricity and propane), water usage, wastewater generation, and the generation of solid waste.

As discussed earlier in this section, although the YSAQMD has not officially adopted any thresholds of significance for GHG emissions, the YSAQMD currently recommends use of the SMAQMD's adopted GHG emissions thresholds of significance. The threshold of significance for both construction and operational GHG emissions is 1,100 $MTCO_2e$/yr. Therefore, if the proposed project would result in GHG emission in excess of 1,100 $MTCO_2e$/yr, the proposed project would be considered to generate GHG emissions that may have a significant impact on the environment.

The proposed project's short-term construction-related and long-term operational GHG emissions are described in further detail below.

Construction-Related GHG Emissions

Construction-related GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change, as global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis. However, the proposed project's construction-related GHG

emissions have been estimated and compared to the applicable threshold of significance, as presented below in Table 4.2-14. Construction-related emissions were modeled using CalEEMod under the assumptions described in the Method of Analysis section above.

Table 4.2-14
Unmitigated Construction-Related GHG Emissions

Construction Year	Annual Emissions ($MTCO_2e$/yr)
2017	224.64
2018	500.60
2019	81.31
Total	806.55
Applicable Threshold of Significance	**1,100**

Source: CalEEMod, February 2017 (see Appendix E)

As shown in Table 4.2-14, construction-related activities associated with the proposed project would result in maximum annual emissions of 500.60 $MTCO_2e$/yr, which would be well below the applicable threshold of significance of 1,100 $MTCO_2e$/yr. Additionally, the total construction GHG emissions would be 806.55 $MTCO_2e$/yr, which would also be below the applicable threshold of significance of 1,100 $MTCO_2e$/yr. Because the proposed project's maximum annual and total construction GHG emissions would be below the applicable threshold of significance, the proposed project would not be considered to generate construction-related GHG emissions that would have a significant impact on the environment.

Operational GHG Emissions

The proposed project's annual operational GHG emissions are presented in Table 4.2-15 below. Project operational emissions were modeled using CalEEMod under the assumptions described above in the Method of Analysis section above.

Table 4.2-15
Unmitigated Operational GHG Emissions

Emission Source	Annual GHG Emissions ($MTCO_2e$/yr)
Area	1.62
Energy	196.82
Mobile	503.83
Solid Waste	30.07
Water	15.84
TOTAL ANNUAL GHG EMISSIONS	**748.18**
Applicable Threshold of Significance	**1,100**

Source: CalEEMod, February 2017 (see Appendix E).

It should be noted that mobile emissions have been included in the total operational emissions presented above. However, as discussed throughout this EIR, the proposed project is considered an infill project and is consistent with the MTP/SCS; therefore, the proposed project is eligible for CEQA streamlining benefits. Projects eligible for CEQA

streamlining do not need to analyze mobile source GHG emissions. In the case of the proposed project, mobile emissions comprise approximately 67 percent of the project's total operational emissions. Although the proposed project is eligible for CEQA streamlining, in order to provide a conservative analysis, the mobile emission related to operation of the proposed project are included in the analysis for potential impacts related to GHG emissions. As shown in Table 4.2-15, the proposed project would result in total operational GHG emissions, including mobile-related GHG emissions, of approximately 748.18 $MTCO_2e$/yr, which would be below the applicable threshold of significance of 1,100 $MTCO_2e$/yr.

Conclusion

Because the proposed project would result in construction-related and operational GHG emissions below the applicable threshold of significance of 1,100 $MTCO_2e$/yr, the proposed project would not be considered to generate GHG emissions, directly or indirectly, that would have a significant impact on the environment. Therefore, the proposed project's impact would be ***less than cumulatively considerable***.

Mitigation Measure(s)
None required.

4.2-7 Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Based on the analysis below, the impact is *less than cumulatively considerable.*

Proposed projects resulting in carbon emissions equal to or less than the carbon allowances presented in Table 4.2-8 above, would not interfere with the City's GHG emissions reductions goals, and would be considered consistent with the City's CAAP. The proposed project is anticipated to be completed by the year 2019; therefore, the carbon allowance for year 2020 would apply (see Table 4.2-9). The City's carbon allowance for 2020 requires that GHG emissions from new residential development do not exceed 3.7 $MTCO_2e$/yr/person, with a preferred emissions level not to exceed 2.7 $MTCO_2e$/yr/person.

As shown in Table 4.2-15 below, the proposed project would result in annual operational GHG emissions of 748.18 $MTCO_2e$. With an anticipated maximum population of 708 residents, the proposed project would result in GHG emissions of approximately 1.06 $MTCO_2e$/yr per person (748.18 $MTCO_2e$/yr / 708 residents = 1.06 $MTCO_2e$/yr/person). Annual GHG emissions of 1.06 $MTCO_2e$/yr per person would be well below the required maximum allowance of 3.7 $MTCO_2e$/yr per person and the preferred emissions level of 2.7 $MTCO_2e$/yr per person for new residential developments by 2020. In fact, as shown in Table 4.2-16, the proposed project would result in emissions below the desired per person carbon allowance of 1.75 $MTCO_2e$/yr for developments in the year 2030.

Table 4.2-16
Project GHG Emissions and Carbon Allowance ($MTCO_2e$/yr per person)

Proposed Project Emissions	2020 Maximum Carbon Allowance	2020 Desired Carbon Allowance	2030 Maximum Carbon Allowance	2030 Desired Carbon Allowance
1.06	3.7	2.7	2.7	1.75

Sources:
- *CalEEMod, February 2017 (see Appendix E).*
- *Niemeier, Deb. Carbon Development Allowances. September 2008.*

The City's desired allowance of 1.75 $MTCO_2e$/yr per person for developments in 2030 is designed to achieve a 53 percent reduction in GHG emissions from 1990 levels. Achievement of a 53 percent reduction in GHG emissions by 2030 would exceed the State's goal of reducing GHG emissions by 40 percent below the 1990 level by 2030. Therefore, the proposed project would be in compliance with the City's GHG reduction targets, which would also place the project in compliance with the State's reduction targets per SB 32.

The emission levels presented above were estimated using project-specific information, such as project energy and water efficiency measures, the project-specific vehicle trip rates, and project specific VMT. The City of Davis has approved GHG credits to be used to incentivize developments that promote alternative means of transportation and reduce single-passenger vehicle trips. For instance, housing projects with a medium or high density of residential units in proximity to employment may claim a two to five percent GHG credit, respectively, or projects within three-quarters of a mile of a transit station may claim between a one and five percent GHG credit.[49] Using the City's recommended GHG credits, the proposed project would be eligible for a minimum GHG reduction credit of seven percent.

The aforementioned GHG credits are related to increased use of alternative means of transportation, and the resultant reduction in mobile source emissions. The CalEEMod emissions modeling completed for the proposed project included project-specific traffic information, provided by Fehr and Peers, which accounted for the use of alternative means of transportation by future residents of the proposed project. Therefore, the emissions presented in Table 4.2-15 and Table 4.2-16 already account for factors such as density of land use and proximity to transit. Because such factors were already included in the quantification of mobile source GHG emissions, application of the City's GHG credits would result in a double counting of emissions reductions. Consequently, the City's GHG credits are not applied to the proposed project. Nevertheless, as presented in Table 4.2-16, the GHG emissions associated with operations of the proposed project would be below the City's applicable GHG thresholds without inclusion of the GHG credits.

[49] City of Davis. *Staff Report: Greenhouse Gas Emissions Thresholds and Standards for New Residential Development*. April 21, 2009.

Based on the above, the proposed project would achieve the GHG emissions reductions target required by the City of Davis, and would result in GHG emissions below the per person carbon allowance for new residential developments in the year 2020 and the year 2030. Because the City's CAAP is based on achievement of the City's GHG reduction targets, the proposed project would not be considered to interfere with the City's adopted CAAP or GHG emissions targets. As such, the proposed project would not be considered to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and impacts would be ***less than cumulatively considerable***.

Mitigation Measures
None Required.