3.5 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This section evaluates air quality criteria pollutant emissions and greenhouse gas (GHG) emissions that would be generated with the implementation of the proposed project.

3.5.1 Setting

Environmental Setting

Air quality is a function of both the rate and location of pollutant emissions, under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed and direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, which affect air quality.

Regional Topography, Meteorology, and Climate

California is divided geographically into air basins for the purpose of managing air resources on a regional basis. The project site is within the Sacramento Valley Air Basin (SVAB), which encompasses 11 counties including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo counties, the westernmost portion of Placer County and the northeastern half of Solano County. Throughout most of the project site, Putah Creek forms the border between Solano and Yolo Counties, and a portion of the project site is in the cities of Winters and Davis.

The distinctive climate of the SVAB is determined by its terrain and geographic location. The SVAB is bounded by the Northern Sierra Nevada Mountains in the east and the North Coast Ranges to the west. The SVAB's Mediterranean climate is characterized by hot, dry summers and mild, rainy winters with temperatures ranging from 30 to 115 degrees Fahrenheit (°F) annually. Average annual rainfall is 15 inches and occurs primarily from November through March. The prevailing winds are moderate in strength, and consist of dry inland flow from the north and moist marine flow from the south (SACOG, 2011).

The surrounding mountains can trap air pollutants by restricting airflow into and out of the SVAB. During the fall and early winter, large high-pressure cells collect over the Sacramento Valley and reduce surface winds and vertical air flow. These conditions restrict the influx of air into the basin and allow air pollutants to become more

concentrated. Concentrations of surface air pollutants can also increase under the influence of boundary-layer temperature inversions (SACOG, 2011).

Criteria Air Pollutants

Regulation of air pollution is achieved through both federal and state ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the U.S. Environmental Protection Agency (US EPA) has identified criteria pollutants and has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb). These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

California has adopted more stringent ambient air quality standards called California Ambient Air Quality Standards (CAAQS) for most of the criteria air pollutants, along with standards for sulfates, hydrogen sulfide, and vinyl chloride. Emissions of these pollutants would not occur with project implementation and therefore are not further analyzed in this EIR.

The physical characteristics and health effects of the criteria pollutants are summarized below:

- Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone production. Concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional air subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds such as ozone.
- CO is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter, when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. In high

concentrations, it can cause physiological and pathological changes sometimes resulting in death by interfering with oxygen transport in the blood.

- PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled, causing adverse health effects. PM in the atmosphere results from many kinds of dust and fume producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of PM, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.
- SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal. Sulfur dioxide also is a precursor to the formation of atmospheric sulfate and PM (both PM10 and $PM_{2.5}$) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.
- Nitrogen Oxides (NO_x) form when combustion temperatures are extremely high, as in aircraft, truck and automobile engines, and atmospheric nitrogen combines with oxygen to form various oxides of nitrogen. Nitric oxide (NO) and nitrogen dioxide (NO_2) are the most significant air pollutants generally referred to as NOx. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema. Inhaling NO_2 can lead to respiratory illnesses such as bronchitis and pneumonia.
- Lead has a range of adverse neurotoxic health effects, and was formerly released into the atmosphere primarily via leaded gasoline. The phasing out of leaded gasoline in California has resulted in decreasing levels of atmospheric lead.

Toxic Air Contaminants

In addition to criteria air pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. TACs, termed hazardous air pollutants (HAPs) under federal regulations, are air pollutants that may cause or contribute to an increase in mortality or serious illness, or may otherwise pose a hazard to human health. There are various sources of TACs, including industrial processes, commercial operations such as gasoline stations and dry cleaners, as well as motor vehicle exhaust. Nearly 200 substances have been designated TACs under California law, including benzene and diesel particulate matter (DPM).

Existing Air Quality Conditions

The Yolo-Solano Air Quality Management District (YSAQMD) operates a regional monitoring network for ambient concentrations of criteria pollutants. Currently, the criteria pollutants of most concern in the SVAB are ozone and PM. The YSAQMD-operated monitoring stations closest to the project site that represent the rural nature of the project area are the Davis station at UC Davis, approximately 2 miles to the north of the site, and the Woodland station on Gibson Road, approximately 10 miles to the north of the project site.

Table 3.5-1 summarizes the most recent three years of available air monitoring data (i.e., 2011 through 2013) published by the California Air Resources Board (CARB) for the Davis and Woodland stations. The data show a small number of violations related to state and federal ozone standards, and state PM10 standards. No other state or federal air quality standards were exceeded during the three-year period.

Table 3.5-1 Air Quality Data Summary for Davis and Woodland, CA, 2011-2013

		Days Standard Exceeded		
Pollutant	**Standard**	**2011**	**2012**	**2013**
Davis – UC Davis Campus				
Ozone	State 1–Hour	0	0	0
	Federal 8–Hour	1	1	0
	State 8–Hour	2	4	0
Woodland – Gibson Road				
Ozone	State 1–Hour	1	4	0
	Federal 8–Hour	0	2	0
	State 8–Hour	2	9	0
PM_{10}	Federal 24–Hour	0	0	0
	State 24–Hour	6	6	23
$PM_{2.5}$	Federal 24–Hour	NA	0	0

Note: NA: No data available.
Source: California Air Resources Board (CARB). 2014. Aerometric Data Analysis and Management (ADAM). Available at: http://www.arb.ca.gov/adam/

The SVAB is currently designated "nonattainment" for State and federal ozone standards, the State PM_{10} standard, and federal $PM_{2.5}$ standard. The SVAB is designated "attainment" or "unclassified" with respect to the other ambient air quality standards.

Sensitive Receptors

Sensitive receptors represent people who are considered to be more sensitive than others to air pollutant impacts. The reasons for greater than average sensitivity include preexisting health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational land uses are also considered sensitive due to the greater exposure to ambient air quality conditions, because vigorous exercise associated with some forms of recreation places a high demand on the human respiratory system.

Greenhouse Gases

GHGs include both naturally occurring and anthropogenic gases that trap heat in the earth's atmosphere. GHGs include but are not limited to carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydro fluorocarbons (HFC), perfluorocarbons (PFC), nitrogen trifluroide (NF_3), and sulfur hexafluoride (SF_6).

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun and re-radiated from the Earth’s surface as it is reflected back into the atmosphere, roughly analogous to the retention of heat energy in a greenhouse. The accumulation of GHGs has been implicated as a driving force for Global Climate Change. Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth’s climate caused by natural fluctuations and the impact of human activities that alter the composition of the global atmosphere. Both natural processes and human activities emit GHGs.

The accumulation of GHGs in the atmosphere regulates the earth’s temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of GHGs in the atmosphere.

Regulatory Setting

Federal Regulations

United States Environmental Protection Agency

The US EPA has established NAAQS for outdoor concentrations of the following "criteria" pollutants: CO, NO_2, Ozone, SO_2, and PM_{10}, $PM_{2.5}$, and lead. An ambient air quality standard establishes the concentration above which the pollutant is known to cause adverse health effects to sensitive groups within the population such as children and the elderly.

Clean Air Act

Under the federal Clean Air Act (CAA), each state must identify non-attainment areas that do not meet the NAAQS. For any non-attainment designation, a State Implementation Plan (SIP) is developed to define actions to be taken to achieve future attainment of the applicable NAAQS. In summary, an attainment area is any area that meets the NAAQS; a non-attainment area is any area that does not meet the NAAQS; and a maintenance area is any area previously designated non-attainment but is in transition back to attainment. The Sacramento Valley Air Basin is currently in "severe" non-attainment of the 1-hour and 8-hour ozone NAAQS and "serious" non-attainment for PM_{10}.

State Regulations

The California Air Resources Board (CARB) is responsible for establishing and reviewing the CAAQS, compiling the California State Implementation Plan (SIP), securing approval of the SIP from the EPA, conducting research and planning, and identifying TACs. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. These districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas. The Districts are also responsible for preparing the air quality plans required under the federal Clean Air Act and the California Clean Air Act.

General Requirements for In-Use Off-Road Diesel Fueled Fleets

Adopted in July 26, 2007, the In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions of DPM and NO_X from in-use off-road diesel vehicles operating in California. CARB estimates the regulation will significantly reduce DPM and NO_X

emissions from the nearly 180,000 off-road diesel vehicles that operate in California, which is necessary to meet state and federal air quality standards. The regulation requires fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits.[1] The regulation also supports the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, which was adopted by CARB on September 30, 2000.

On-Road Heavy-Duty Diesel Vehicles (In-Use)

On December 12, 2008, CARB approved a new regulation, the *On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation***,** to substantially reduce emissions from existing on-road diesel vehicles operating in California. The regulation requires affected trucks to meet performance requirements between 2011 and 2023. By January 1, 2023, all vehicles must have a 2010 model year engine or equivalent; this includes on-road heavy-duty diesel fueled vehicles with a gross vehicle weight rating greater than 14,000 pounds.[2]

Local Regulations

Yolo Solano Air Quality Management District (YSAQMD) Air Quality Management Plan

The YSAQMD recently prepared the sixth update of the YSAQMD's 1992 Air Quality Management Plan. The *Triennial Assessment and Plan Update,* April 2013, emission reductions information (2009 to 2011), emission inventory and forecasts, air quality trends up to 2011, and proposed commitments for the 2012-2014 period. While the

[1] The regulation establishes fleet average emission rates for PM and NO_X that decline over time. Each year, the regulation requires each fleet to meet the fleet average emission rate targets for PM or apply the highest-level verified diesel emission control system to 20 percent of its horsepower. In addition, large and medium fleets are required each year to meet the fleet average emission rate targets for NO_X or to turn over a certain percent of their horsepower (8 percent in early years, and 10 percent in later years). "Turn over" means repowering with a cleaner engine, rebuilding the engine to a more stringent emissions configuration, retiring a vehicle, replacing a vehicle with a new or used piece, or designating a dirty vehicle as a low-use vehicle. If retrofits that reduce NO_X emissions become available, they may be used in lieu of turnover, as long as they achieve the same emission benefits.

[2] In general, the On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation requires owners to reduce emissions in their fleet by upgrading existing vehicles one of three ways. The first option is to install PM retrofits and replace vehicles (or engines) according to a prescribed schedule based on the existing engine model year. The second option is to retrofit a minimum number of engines each year with a high level PM exhaust retrofit and to replace a minimum number of older engines with newer engines meeting the 2010 new engine standards. The third option is to meet a fleet average. With this option, a fleet operator can use PM and NO_X emission factors established by the regulation to calculate the average emissions of the fleet. Then, by the applicable compliance date each year, the owner can demonstrate that the fleet average emissions for PM and NO_X do not exceed the PM and NO_X fleet average emission rate targets set by the regulation.

District is not required to prepare an attainment plan for particulate matter measuring 10 microns and less in diameter (PM_{10}), particulate matter emissions are being reduced through numerous District rules affecting sources, the construction industry, and agricultural burning programs.

As noted in the YSAQMD CEQA Guidelines, even projects not exceeding district PM thresholds should implement Best Management Practices to reduce dust emissions and avoid localized health impacts. Those measures are found in Section 6.1 of the Guidelines (YSAQMD, 2007).

Greenhouse Gas Regulations

Executive Orders

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

In April 2015, Governor Brown issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030.

Assembly Bill 32 – California Global Warming Solutions Act

California passed the California Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that is being phased in (starting in 2012). To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB

should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions.

CARB Climate Change Scoping Plan

In 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations (CARB 2008). CARB's Scoping Plan contains the main strategies California will implement to reduce carbon dioxide equivalent (CO_2e) emissions by 169 million metric tons (MMT), or approximately 30 percent, from the State's projected 2020 emissions level of 596 MMT of CO_2e under a Business as Usual (BAU) scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020).

CARB's Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. CARB's Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);
- The Low Carbon Fuel Standard (15.0 MMT CO_2e);
- Energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2e).

The First Update to the Scoping Plan was approved by the CARB in May 2014, and builds upon the initial Scoping Plan with new strategies and recommendations. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. This Update identified nine key focus areas (energy, transportation, agriculture, water, waste management, and natural and working lands), along with short-lived climate pollutants, green buildings, and the cap-and-trade program.

State CEQA Guidelines

In 2007, the legislature passed SB97, which required amendment of the State CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA compliance. These amendments took effect in March 2010.

The Guidelines' revisions include a new section (Section 15064.4) that specifically addresses the significance of GHG emissions. Section 15064.4 calls for a good-faith effort to describe, calculate or estimate GHG emissions. Section 15064.4 further states that the significance of GHG impacts should include consideration of the extent to which the project would increase or reduce GHG emissions; exceed a locally applicable threshold of significance; and comply with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The revisions also state that a project may be found to have a less-than-significant impact if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Section 15064(h)(3)). Importantly, the revised guidelines provide the lead agency discretion to determine significance thresholds for GHG emissions.

3.5.2 Significance Criteria

Criteria Air Pollutants

Criteria for determining significant impacts are based upon the CEQA Guidelines (Appendix G) and professional judgment. These guidelines state that the project would have a significant impact on visual quality if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3. Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
4. Expose sensitive receptors to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

The YSAQMD has developed CEQA significance thresholds for project construction and operation for guidance to lead agencies responsible for determining significant air quality impacts for their projects. YSAQMD's significance thresholds are 80 pounds per day of PM_{10} and 10 tons per year of ROG or NOx (YSAQMD, 2007).

Greenhouse Gas Emissions

State CEQA Guidelines (Appendix G), which indicate that the project would have a significant impact on GHG emissions if it would:

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

Currently, for GHG evaluations, the methodologies and significance thresholds are different in almost every air district. The YSAQMD has not identified a significance threshold for GHG emissions for new projects. It is recognized that for most projects there is no simple metric available to determine if a single project would help or hinder meeting the AB 32 emission goals. The air quality analysis quantifies the GHG emissions to provide a perspective on the amount of GHG emissions this project would generate.

Although it is possible to generally estimate a project's incremental contribution of CO_2 into the atmosphere, it is not possible to determine whether or how a specific project's relatively small incremental contribution might translate into physical effects on the environment (e.g., sea level rise, loss of snowpack, severe weather events, etc.). Given the complex interactions between various global and regional physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO_2 emitted by a specific project would result in any altered conditions.

Three types of analyses are used to determine whether the proposed project would conflict with the State goals for reducing GHG emissions. The analyses are as follows:

A. Any potential conflicts with CARB's 39 recommended actions contained in its Climate Change Scoping Plan.

B. The relative size of the project's GHG emissions compared to the size of major facilities required to report GHG emissions (25,000 metric tons/year of CO2e) to the state.

C. Potential conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

3.5.3 Impacts and Mitigation Measures

Impacts and mitigation measures are described below both generally and by reach. Applicable impacts and mitigation measures for each reach are summarized in **Table 3.5-4,** at the end of this section.

General Impacts and Mitigation Measures

Impact 3.5-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan Implementation.

The applicable air quality plan is the YSAQMD's 1992 AQMP. The YSAQMD recently prepared the sixth update of the 1992 Plan in April 2013. A project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds growth estimates included in the applicable air quality plan. The proposed project would not result in population or employment growth, as it would only restore and enhance areas along Putah Creek. Consequently, there would be no impacts to the applicable air quality plans, and no mitigation would be required. Thus, the air quality impacts related to the air quality plan would be **less than significant**.

Impact 3.5-2: Short-Term Construction Emissions of Criteria Pollutants that May Contribute to Existing or Projected Air Quality Violation.

The proposed project's construction activities would involve hauling of materials and equipment, excavation of channels, channel reconfiguration, grading, and stockpiling and reuse of channel substrate materials. Construction equipment would include dump trucks, rubber tired loaders, off-highway trucks, tractors/loaders/backhoes, an excavator and a generator. Maximum daily and annual emissions that would be generated from construction activities are presented below. The Roadway Construction

Emissions Model Version 7.1.2 was used to estimate the emissions from construction equipment, fugitive dust associated with construction, worker commuting vehicles and hauling vehicles. The emission estimates assume a maximum of two reaches restored over 6 months (April to October) of construction per year. The air quality calculations for the construction activities can be found in **Appendix F** of this EIR.

As shown above in **Table 3.5-2** and **Table 3.5-3**, the proposed project's construction activities would not exceed the YSAQMD CEQA significance thresholds. Even though the quantitative estimates in Table 3.5-2 and Table 3.5-3 don't indicate a violation of the thresholds, poor construction practices could result in substantial emissions of dust that would be a nuisance and could create localized health impacts (YSAQMD, 2007). Without implementation of air quality construction Best Management Practices, air quality impacts could be **potentially significant**. With implementation of Mitigation Measure 3.5-1 the impact of air quality emissions from construction would be **less than significant.**

Table 3.5-2 Unmitigated Daily Project Emissions (Pounds per Day)

Condition	PM_{10}
Daily	20.0
YSAQMD CEQA Threshold	*80*
Above CEQA Significant?	*No*

Note: The Roadway Construction Emissions Model, developed by the SMAQMD, is used to assist roadway project and other linear projects with determining the emissions impacts of the project. The model utilizes statewide emission factors based on CARB's OFFROAD2011 and EMFAC2011 models as well as fugitive dust emission factors from US EPA's AP-42.
Source: Roadway Construction Emissions Model, Version 7.1.2.

Table 3.5-3 Unmitigated Annual Project Emissions (Tons per Year)

Condition	ROG	NO_x
Annual	0.4	7.0
YSAQMD CEQA Threshold	*10*	*10*
Above CEQA Significant?	*No*	*No*

Note: The Roadway Construction Emissions Model, developed by the SMAQMD, is used to assist roadway project and other linear projects with determining the emissions impacts of the project. The model utilizes statewide emission factors based on CARB's OFFROAD2011 and EMFAC2011 models as well as fugitive dust emission factors from US EPA's AP-42.
Source: Roadway Construction Emissions Model, Version 7.1.2.

Mitigation Measure 3.5-1: Implementation of Construction Best Management Practices.

Project construction activities should implement as feasible and necessary to control dust, the Best Management Practices for construction identified in Section 6.1 of the YSAQMD 2007 CEQA Handbook. Best Management Practices identified to reduce dust emissions include:

- Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Haul trucks shall maintain at least 2 feet of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.
- Plant vegetative ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles.
- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6 to 12 inch layer of wood chips or mulch.
- Treat accesses to a distance of 100 feet from the paved road with a 6- inch layer of gravel.

Impact 3.5-3: Short-Term Construction Emissions that May Expose Persons to Substantial Levels of Toxic Air Contaminants.

The proposed project would be located in a predominantly rural agricultural area within Yolo and Solano County, and the City of Winters. However, there are several homes north of the creek in the City of Winters. Construction activities would entail the use of diesel equipment that would generate emissions of diesel particulate matter (DPM), which the CARB has categorized as a human carcinogen. Typically, health risks are estimated based on a chronic exposure period of 70 years. Because exhaust emissions associated with construction activities of the proposed project would be relatively low, short-term in nature, move throughout the project vicinity and well below the typical

exposure period of 70 years, it is not anticipated that exposure to construction-related DPM would result in an elevated health risk. Thus, the impacts from TACs would be **less than significant**

Impact 3.5-4: Short-Term Objectionable Odors Exposure to Sensitive Receptors.

Although odors rarely cause physical harm, they can lead to considerable distress to the public and can result in citizen complaints to local governments and the YSAQMD. A project may be expected to have a substantial adverse odor impact where it "generates odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property" (YSAQMD Rule 2.5).

Short-term objectionable odors could occur during project construction with the use of diesel-powered heavy equipment. However, these odors would be periodic and temporary in nature. Diesel exhaust from construction activities may generate temporary odors while project construction is under way. Once construction activities have been completed, these odors would cease. There are very few receptors throughout most of the project area that could potentially be offended by odors. The project would not generate any objectionable odors that would affect a substantial number of people. Thus, odor impacts would be **less than significant**.

Impact 3.5-5: Long Term Emissions From Project Maintenance.

The proposed project is designed to be self-maintaining, however some maintenance and adaptive management may be required. This may involve periodic trips for inspections of the channel and associated vegetation, and repairs and maintenance as needed. Emissions associated with inspections and maintenance would be short-term and minimal. If any major projects were needed they would undergo separate CEQA review. Thus, long-term emission impacts would be **less than significant**.

Impact 3.5-6: Greenhouse Gases and Global Climate Change Contributions

As noted in Section 3.3.3, Significance Criteria for GHG, there are three GHG analyses that have been undertaken with respect to the project. The first analysis was with compliance with AB 32 measures (Item A). The project would not conflict with any of the 39 recommended actions contained in the Climate Change Scoping Plan. The State's AB 32 Scoping Plan will generally be implemented through mandatory regulations

enacted by the CARB. The 39 recommended actions contained in the Climate Change Scoping Plan can be found in Appendix F of this EIR.

Next (Item B), the maximum total GHG emissions from the project would be approximately 997 metric tons per year of CO_2e. The estimated GHG emissions would be far less than the threshold of 25,000 metric tons per year. The 25,000 metric ton annual limit identifies the large stationary point sources in California that make up approximately 94 percent of the stationary emissions. If a project's total emissions are below this limit, its total emissions are equivalent in size to the smaller projects in California that as a group only make up 6 percent of all stationary emissions. It is assumed that the activities of these smaller projects generally would not conflict with state's ability to reach AB 32 overall goals. In reaching its goals, CARB will focus upon the largest emitters of GHG emissions. The estimated project emissions of 997 metric tons per year would be less than 4 percent of the 25,000 metric ton limit. This would not be considered a major project from the standpoint of GHG emissions.

Lastly (Item C), the project would not be in conflict with the any local plans for Yolo County, Solano County, the City of Winters or the YSAQMD AQMP for reducing GHG emissions. The local plans do not contain restrictions on minor construction projects. The project would help to restore and enhance Putah Creek and any emissions associated with the project would be temporary as with all construction projects.

In summary, the estimated GHG emissions during construction are less than the 4 percent of the threshold of 25,000 metric tons per year and thus, construction of the project would result in a less than significant impact of GHG emissions. Also, the proposed project would not conflict with the AB 32 Scoping Plan nor adopted local plans for reducing GHG emissions. Therefore, impacts regarding GHG emissions would be **less than significant**.

Site-Specific Impacts and Mitigation

All Sites

Construction impacts described in Section 3.5.3 would occur on all of the Project reaches that involve earthmoving activities. The impacts were evaluated in Section 3.5.1 and determined to be less than significant. Small operational emissions would occur. Therefore, this impact would be less than significant and no mitigation is required.

Table 3.5-4 Summary of Recreation Impacts and Mitigation Measures

Sites	Impact 3.5-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan Implementation	Impact 3.5-2: Short-Term Construction Emissions	Impact 3.5-3: Short-Term Construction Toxic Air Contaminants	Impact 3.5-4: Short-Term Objectionable Odors	Impact 3.5-5: Long Term Emissions From Project Maintenance	Impact 3.5-6: Greenhouse Gases and Global Climate Change Contributions	Applicable Mitigation Measures
NAWCA/Mariani	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Duncan-Giovannoni	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Winters Putah Creek Nature Park	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
East of 505	NI	SM	LTS	LTS	LTS	LTS	MM3.5-1
Warren	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Upper McNamara	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Lower McNamara	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
MacQuiddy (Leste)r	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Russell Ranch	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Stevenson Bridge	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Glide Ranch	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Nishikawa	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Olmo-Hammond-UCD	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
I-80 to Old Davis Road	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Old Davis Road to Mace	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Mace to Road 106A	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1
Road 106A to YBWA	NI	SM	LTS	LTS	LTS	LTS	MM 3.5-1