Chapter 22
Air Quality and Greenhouse Gases

22.1 Affected Environment/Environmental Setting

The Plan Area (the area covered by the BDCP) consists of the Sacramento–San Joaquin River Delta, the Suisun Marsh, the Yolo Bypass, and the Areas of Additional Analysis, as discussed in Chapter 3, *Description of Alternatives,* Section 3.3.1. Sensitive receptors associated with residential and recreational land uses are located in the Plan Area. The potential air quality and greenhouse gas (GHG) effects of the proposed water conveyance facility (Conservation Measure 1 [CM1]) on these receptors are evaluated quantitatively at the project level, and the effects of the Conservation Measures 2–22 are evaluated qualitatively at the program level, consistent with the approach described in Chapter 4, *Approach to the Environmental Analysis*, Section 4.1.2.

More reliable water exports could facilitate new growth and development in the State Water Project (SWP) and Central Valley Project (CVP) Export Service Areas (Export Service Areas). Impacts on air quality associated with this growth are addressed in Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.3.2.

This section describes existing conditions related to air quality and GHG in the air quality study area (the area in which impacts may occur). It then discusses federal, state, and local regulations related to air quality that would apply to the alternatives. The chapter assesses local and regional air quality impacts associated with criteria pollutants and toxic air contaminants (TAC) generated by construction and operation of the BDCP alternatives. With respect to GHGs, the chapter evaluates the impact of the BDCP alternatives on climate change (i.e., the project's contribution to elevated GHG concentrations in the atmosphere). Potential effects of climate change on specific resources (e.g., land use) are discussed qualitatively for applicable resource topics throughout this document. Resource chapters that rely on CALSIM II/DSM2 modeling results address potential climate change and sea-level rise for the No Action and BDCP alternatives. The ability for the BDCP alternatives to affect the resiliency and adaptability of the Plan Area to the effects of climate change is described in Chapter 29, *Climate Change*.

The study area (i.e., the area in which impacts may occur) for the analysis of air quality effects is the area immediately surrounding and within 1,000 feet of the construction and operational fenceline. The study area for GHGs is much broader due to the global nature of climate change. While the GHG analysis focuses on emissions generated at the project site as a result of construction and operation, the analysis considers potential regional and global GHG effects.

22.1.1 Regional Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources. Meteorological and topographical conditions are also important—atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Land use and land management also contribute to microclimates through the absorption and emission of GHG emissions (discussed further below).

California is divided into 15 air basins based on geographic features that create distinctive regional climates. The air quality study area encompasses the following three air basins: Sacramento Valley Air Basin (SVAB), San Joaquin Valley Air Basin (SJVAB), and the San Francisco Bay Area Air Basin (SFBAAB). The following section discusses climate and meteorological information associated with these three basins. Figure 22-1 highlights the three air basins in the study area.

22.1.1.1 Sacramento Valley Air Basin

The SVAB is bounded on the north by the Cascade Range, on the south by the SJVAB, on the east by the Sierra Nevada, and on the west by the Coast Ranges. The SVAB contains all of Tehama, Glenn, Butte, Colusa, Yolo, Sutter, Yuba, Sacramento, and Shasta Counties, as well as a portion of Solano and Placer Counties (CCR § 60106).

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the north Pacific storm track intermittently dominates Sacramento Valley weather, and fair weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which is most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminish with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20°F to 115°F, with summer high temperatures often exceeding 90°F and winter low temperatures occasionally dropping below freezing.

In general, the prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow that can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduce the influx of outside air and allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions (warm air over cool air), which trap 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. During about half of the days from July to September, however, a phenomenon called the Schultz eddy prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento Valley and Yolo County. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the Delta sea breeze arrives (Yolo-Solano Air Quality Management District 2007).

22.1.1.2 San Joaquin Valley Air Basin

The SJVAB is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The SJVAB contains all of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties, as well as a portion of Kern County (CCR § 60107).

The area has an inland Mediterranean climate that is characterized by warm, dry summers and cool winters. Summer high temperatures often exceed 100°F, averaging in the low 90s in the northern valley and high 90s in the southern portion.

Although marine air generally flows into the basin from the Delta, the surrounding mountain ranges restrict air movement through and out of the valley. Wind speed and direction influence the dispersion and transportation of pollutants—the more wind flow, the less accumulation.

The vertical dispersion of air pollutants in the SJVAB is limited by the presence of persistent temperature inversion. Due to differences in air density, the air above and below the inversion do not mix. Air pollutants tend to collect under an inversion, leading to higher concentrations of emitted pollutants.

Precipitation and fog tend to reduce pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. Precipitation in the San Joaquin Valley decreases from north to south, with approximately 20 inches in the north, 10 inches in the middle, and less than 6 inches in the south (San Joaquin Valley Air Pollution Control District 2002).

22.1.1.3 San Francisco Bay Area Air Basin

The SFBAAB contains all of Napa, Contra Costa, Alameda, Santa Clara, San Mateo, San Francisco, and Marin Counties, as well as a portions of Sonoma and Solano Counties (CCR § 60101). Climate within the SFBAAB is characterized by moderately wet winters and dry summers. Winter rains, which occur in the months of December through March, account for about 75% of the average annual rainfall.

Climate is affected by marine air flow and the basin's proximity to the San Francisco Bay. Bay breezes push air onshore during the daytime and draw air offshore at night. During the summer months, the bay helps to cool the warm onshore flows, while it warms the air during the winter months. This mediating effect keeps temperatures relatively consistent throughout the year. In the westernmost portion of the SFBAAB, which encompasses the study area, the bay wind patterns can concentrate and carry air pollutants from other cities to the region, adding to the mix of pollutants that are emitted locally (Bay Area Air Quality Management District 2011).

22.1.2 Background Information on Criteria Air Pollutants

The federal and state governments have established national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), respectively, for six criteria pollutants: ozone, carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM), which consists of PM10 microns in diameter or less (PM10) and PM 2.5 microns in diameter or less (PM2.5).

Ozone and NO_2 are considered regional pollutants because they (or their precursors) affect air quality on a regional scale; NO_2 reacts photochemically with reactive organic gases (ROGs) to form ozone, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as CO, SO_2, and Pb are considered to be local pollutants that tend to accumulate in the air locally. Particulate matter is considered to be a local as well as a regional pollutant.

The principal characteristics surrounding the pollutants of primary concern in the study area are discussed below. TACs are also discussed below, although no air quality standards exist for these pollutants.

22.1.2.1 Ozone

Ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and increases susceptibility to respiratory infections. It is also an oxidant that causes extensive damage to plants through leaf discoloration and cell damage. It can cause substantial damage to other materials as well, such as synthetic rubber and textiles.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors—ROG and nitrogen oxides (NO_X)—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_X, are mainly emitted by mobile sources and by stationary combustion equipment.

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases, including ROGs and volatile organic compounds (VOCs). ROGs are defined by state rules and regulations; VOCs are defined by federal rules and regulations. For the purposes of this assessment, hydrocarbons are classified and referred to as ROGs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels, or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry-cleaning solutions, and paint (through evaporation).

The health effects of hydrocarbons result from the formation of ozone. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered TACs. There are no separate health standards for ROGs, although some are also toxic; an example is benzene, which is both an ROG and a carcinogen.

22.1.2.2 Nitrogen Oxides

Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone, and react in the atmosphere to form acid rain. Nitrogen dioxide, often used interchangeably with NO_X, is a brownish, highly reactive gas that is present in all urban environments. The major human sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (U.S. Environmental Protection Agency 2010). The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographical area may not be representative of local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects primarily depends on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, such as coughing, difficulty breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe symptomatic NO_2 intoxication after acute exposure has been linked to prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung function (U.S. Environmental Protection Agency 2010).

22.1.2.3 Carbon Monoxide

CO has little effect on plants and materials, but it can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects range from slight headaches to nausea to death.

Motor vehicles are the primary source of CO emissions in most areas. In the study area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. Dramatic reductions in CO levels across California, including a 50% decrease in statewide peak CO levels between 1980 and 2004, have been witnessed during the past several decades. These reductions are primarily a result of California Air Resources Board (ARB) requirements for cleaner vehicles, equipment, and fuels (California Air Resources Board 2004:1).

22.1.2.4 Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair, is referred to as PM10. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair, is referred to as PM2.5. Major sources of PM10 include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM2.5 results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, PM10 and PM2.5 can be formed in the atmosphere from gases such as SO_2, NO_X, and VOCs.

PM10 and PM2.5 pose a greater health threat than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM10 and PM2.5 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body; they can also transport absorbed gases such as chlorides or ammonium into the lungs and cause injury. Whereas particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, and contribute to haze and reduce regional visibility.

22.1.2.5 Sulfur Oxides

Sulfur oxides are any of several compounds of sulfur and oxygen, of which the most relevant to air quality is SO_2. SO_2 is produced by coal and oil combustion and such stationary sources as steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant that causes the bronchioles to constrict with inhalation at 5 parts per million (ppm) or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

22.1.2.6 Toxic Air Contaminants

TACs are pollutants that may result in an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. In 1998, following a 10-year scientific assessment process, the ARB identified PM from diesel-fueled engines—commonly called diesel particulate matter (DPM)—as a TAC. Compared to other air toxics ARB has identified, DPM emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000:1).

22.1.3 Background Information on Climate Change and Greenhouse Gas Emissions

22.1.3.1 Climate Change

The phenomenon known as the *greenhouse effect* keeps the atmosphere near the Earth's surface warm enough for the successful habitation of humans and other life forms. Present in the Earth's lower atmosphere, GHGs play a critical role in maintaining the Earth's temperature; GHGs trap some of the long-wave infrared radiation emitted from the Earth's surface that would otherwise escape to space (Figure 22-2). According to Assembly Bill 32 (AB 32), California's Global Warming Solutions Act, GHGs include the following gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorinated carbons (PFCs), sulfur hexafluoride (SF_6), and hydrofluorocarbons (HFCs). State California Environmental Quality Act guidelines (CEQA Guidelines) (§15364.5) also identify these six gases as GHGs.

Sunlight passes through the atmosphere including infrared, visible, and ultraviolet. Some of the sunlight striking the earth is absorbed and converted to heat, which warms the surface. The surface emits infrared radiation to the atmosphere, where some of it is absorbed by GHGs and re-emitted toward the surface; some of the heat is not trapped by GHGs and escapes into space. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the earth. (Center for Climate and Energy Solutions 2011.)

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution. Rising atmospheric concentrations of GHGs in excess of natural levels enhance the greenhouse effect, which contributes to global warming of the earth's lower atmosphere induces large-scale changes in ocean circulation patterns, precipitation patterns, global ice cover, biological distributions, and other changes to the earth system that are collectively referred to as climate change.

The Intergovernmental Panel on Climate Change (IPCC) has been established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that the average global temperature rise between the years 2000 and 2100 could range from 1.1° Celsius, with no increase in GHG emissions above year 2000 levels, to 6.4° Celsius, with substantial increase in GHG emissions (Intergovernmental Panel on Climate Change 2007a:97-115). Large increases in global temperatures could have substantial adverse effects on the natural and human environments on the planet and in California.

This chapter address the potential GHG emissions of the proposed BDCP. A more extensive discussion of climate change and how the BDCP alternatives affect the study area's resiliency to expected changes in climate can be found in Chapter 29, *Climate Change,* Section 29.6. Within the Delta Reform Act, Water Code Section 85320 identifies the contents that the EIR portion of this Draft EIR/EIS must include for the BDCP to be considered for inclusion in the Delta Plan prepared by the Delta Stewardship Council. Section 85320(b)(2)(C) of the Water Code directs that the EIR address "[t]he potential effects of climate change*, possible sea level rise up to 55 inches* [140 centimeters], and possible changes in total precipitation and runoff patterns on the conveyance alternatives and habitat restoration activities considered in the [EIR]." (Italics added.). Each resource chapter evaluates how the BDCP alternatives would affect the specific resource in question. In each of these analyses, where the effects of the BDCP alternatives are analyzed at future time periods, climate change is integrated into the analysis. In these analyses, the BDCP alternatives are evaluated using a projection of future climate that includes changes in temperature, precipitation, humidity, hydrology, and sea level rise. These analyses fulfill the requirements for climate change analysis outlined in the Delta Reform Act of 2009 (Cal. Water Code, § 85000 *et seq*.).

22.1.3.2 Principal Greenhouse Gas Emissions Generated by the Alternatives

The primary GHGs generated by the alternatives would be CO_2, CH_4, N_2O, and SF_6. Each of these gases is discussed in detail below. Note that PFCs and HFCs are not discussed as these gases are primarily generated by industrial processes, which are not anticipated as part of the project.

To simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in the IPCC reference documents (Intergovernmental Panel on Climate Change 1996, 2001:241–280). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table 22-1 lists the global warming potential of CO_2, CH_4, N_2O, and SF_6; their lifetimes; and abundances in the atmosphere.

Table 22-1. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

Greenhouse Gases	Global Warming Potential (100 years)	Lifetime (years)	2005 Atmospheric Abundance
CO_2 (ppm)[a]	1	50–200	379
CH_4 (ppb)	21	9–15	1,774
N_2O (ppb)	310	120	319
SF_6 (ppt)[a]	23,900	5.6	5.6

Sources: Intergovernmental Panel on Climate Change 1996, 2001:388–390.
ppm = parts per million by volume.
ppb = parts per billion by volume.
ppt = parts per trillion by volume.

Carbon Dioxide

CO_2 is the most important anthropogenic GHG and accounts for more than 75% of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated (Intergovernmental Panel on Climate Change 2007a). The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO_2 can also be removed from the atmosphere by photosynthetic organisms.

Atmospheric CO_2 has increased from a pre-industrial concentration of 280 ppm to 379 ppm in 2005 (Intergovernmental Panel on Climate Change 2007b).

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 21 (Intergovernmental Panel on Climate Change 1996). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal. (National Oceanic and Atmospheric Administration 2005). Certain land uses also function as a both a source and sink for CH_4. For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere).

Atmospheric CH_4 has increased from a pre-industrial concentration of 715 ppb to 1,774 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b).

Nitrous Oxide

N_2O is a powerful GHG, with a GWP of 310 (Intergovernmental Panel on Climate Change 1996). Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion. In the United States (U.S.) more than 70% of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application.

N_2O concentrations in the atmosphere have increased 18% from pre-industrial levels of 270 ppb to 319 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b).

Sulfur Hexafluoride

SF_6, a human-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2006a). In 2005, atmospheric concentrations of SF_6 were 5.6 parts per trillion (ppt) and steadily increasing in the atmosphere. SF_6 is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,900 (Intergovernmental Panel on Climate Change 1996).

22.1.3.3 Greenhouse Gas Emissions Inventories

A GHG inventory is a quantification of all GHG emissions and sinks within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (i.e., for global and national entities) or on a small scale (i.e., for a particular building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources.

Table 22-2 outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 22-2. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory[a]	CO_2e (metric tons)
2004 IPCC Global GHG Emissions Inventory	49,000,000,000
2010 EPA National GHG Emissions Inventory	6,821,800,000
2009 ARB State GHG Emissions Inventory	452,970,000
2007 SFBAAB GHG Emissions Inventory	95,800,000
2005 Sacramento County GHG Emissions Inventory	12,422,425
2008 Yolo County Unincorporated GHG Emissions Inventory	651,470

Sources: Intergovernmental Panel on Climate Change 2007a; U.S. Environmental Protection Agency 2012a; California Air Resources Board 2010; ICF International 2012; Bay Area Air Quality Management District 2010; Yolo County 2011.

[a] GHG emissions inventories for Yolo County and the SJVAB are currently unavailable.

22.1.4 Existing Air Quality Conditions

The existing air quality conditions in the study area can be characterized by monitoring data collected in the region. Table 22-3 summarizes data for criteria air pollutant levels from monitoring stations in the SVAB, SJVAB, and SFBAAB for the last 3 years for which complete data are available (2008–2010). Air quality concentrations are expressed in terms of ppm or micrograms per cubic meter ($\mu g/m^3$). As shown in Table 22-3, the monitoring stations have experienced violations of the NAAQS and CAAQS for all pollutants except CO and NO_2.

22.1.4.1 Attainment Status

Local monitoring data (Table 22-3) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as:

- Nonattainment—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified—assigned to areas were data are insufficient to determine whether a pollutant is violating the standard in question.

Table 22-4 summarizes the attainment status of the portions of the study area within the SVAB, SJVAB, and SFBAAB with regard to the NAAQS and CAAQS.

22.1.5 Sensitive Receptors

The NAAQS and CAAQS apply at publicly accessible areas, regardless of whether those areas are populated. For the purposes of air quality analysis, sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (e.g., 24-hour, 8-hour, and 1-hour). Typical sensitive receptors include residences, hospitals, and schools. Please refer to Chapter 23, *Noise*, Section 23.2.3, for additional information on sensitive receptors in the study area.

Table 22-3. Ambient Air Quality Monitoring Data for the SVAB, SJVAB, SFBAAB (2008–2010)

	Sacramento Valley			San Joaquin Valley			San Francisco Bay Area		
Pollutant Standards	2008	2009	2010	2008	2009	2010	2008	2009	2010
Ozone (O_3)									
Maximum 1-hour concentration (ppm)	0.166	0.122	0.198	0.157	0.135	0.140	0.141	0.113	0.150
Maximum 8-hour concentration (ppm)	0.123	0.104	0.112	0.132	0.110	0.114	0.110	0.094	0.097
Number of days standard exceeded[a]									
CAAQS 1-hour (>0.09 ppm)	41	29	16	95	82	59	9	11	8
CAAQS 8-hour (>0.070 ppm)	78	65	47	150	122	115	20	13	11
NAAQS 8-hour (>0.075 ppm)	54	45	30	127	98	93	12	8	9
Carbon Monoxide (CO)									
Maximum 8-hour concentration (ppm)	2.84	2.84	1.89	2.34	2.41	2.03	2.48	2.86	2.19
Maximum 1-hour concentration (ppm)	-	-	-	-	-	-	-	-	-
Number of days standard exceeded[a]									
NAAQS 8-hour (≥9 ppm)	0	0	0	0	0	0	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0	0	0	0	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0	0	0	0	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide (NO_2)									
State maximum 1-hour concentration (ppm)	0.115	0.068	0.095	0.098	0.076	0.082	0.080	0.069	0.093
State second-highest 1-hour concentration (ppm)	0.090	0.062	0.079	0.083	0.070	0.079	0.073	0.062	0.089
Annual average concentration (ppm)	0.010	0.009	0.008	0.013	0.011	0.010	0.012	0.012	0.011
Number of days standard exceeded									
CAAQS 1-hour (0.18 ppm)	0	0	0	0	0	0	0	0	0
Particulate Matter (PM10)[b]									
National[c] maximum 24-hour concentration (μg/m³)	236.7	76.0	87.4	358.1	423.8	118.8	78.2	51.7	69.1
National[c] second-highest 24-hour concentration (μg/m³)	113.8	74.0	49.1	338.1	115.7	86.4	59.4	31.0	45.0
State[d] maximum 24-hour concentration (μg/m³)	232.0	76.0	87.4	353.5	139.5	238.0	77.0	55.4	69.6
State[d] second-highest 24-hour concentration (μg/m³)	111.2	74.0	48.2	125.6	116.6	112.8	61.0	32.4	46.2
National annual average concentration (μg/m³)	32.9	25.6	20.5	59.7	57.5	35.0	23.6	19.5	20.3
State annual average concentration (μg/m³)[e]	33.4	26.4	21.0	55.9	46.5	35.0	24.1	20.3	19.5
Number of days standard exceeded[a]									
NAAQS 24-hour (>150 μg/m³)[f]	1	0	0	3	1	0	0	0	0

Table 22-3. Continued

Pollutant Standards	Sacramento Valley			San Joaquin Valley			San Francisco Bay Area		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
CAAQS 24-hour (>50 μg/m³)[f]	11	3	2	33	31	67	3	1	1
Particulate Matter (PM2.5)									
National[c] maximum 24-hour concentration (μg/m³)	200.2	49.8	72.2	100.3	195.5	107.8	60.3	45.7	46.5
National[c] second-highest 24-hour concentration (μg/m³)	127.3	45.9	33.9	99.3	167.7	92.2	50.0	39.0	45.3
State[d] maximum 24-hour concentration (μg/m³)	200.2	71.7	92.3	118.8	195.5	112.0	74.9	49.8	41.5
State[d] second-highest 24-hour concentration (μg/m³)	190.9	59.2	43.0	106.8	167.7	107.8	60.3	45.7	36.4
National annual average concentration (μg/m³)	16.4	10.7	8.8	23.5	22.5	17.9	11.5	10.1	10.5
State annual average concentration (μg/m³)[e]	18.9	15.5	10.9	21.1	21.2	17.2	13.7	10.1	9.0
Number of days standard exceeded[a]									
NAAQS 24-hour (>35 μg/m³)	37	9	1	67	51	29	7	5	3
Sulfur Dioxide (SO_2)									
No data available									

Source: California Air Resources Board 2011a.

ppm = parts per million.
NAAQS = National Ambient Air Quality Standards.
CAAQS = California Ambient Air Quality Standards.
μg/m³ = micrograms per cubic meter.
mg/m³ = milligrams per cubic meter.
> = greater than.
NA = not applicable.

[a] An exceedance is not necessarily a violation.

[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, State statistics are based on California approved samplers.

[d] Measurements usually are collected every 6 days.

[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

Table 22-4. Federal and State Attainment Status of the Study Area within the SVAB, SJVAB, and SFBAAB

	SVAB		SJVAB		SFBAAB	
Pollutant	Federal	State	Federal	State	Federal	State
Ozone (1 hr)	-	N[a] (serious)	-	N (severe)	-	N[a] (serious)
Ozone (8 hr)	N (severe-15)	N[a]	N (extreme)	N	N (marginal)	N
CO	M[a] (moderate)	A/U	M[a] (moderate)	A/U	M[a] (moderate)	A/U
PM10	N[a] (moderate)	N	M (serious)	N	A/U	N
PM2.5	N	N[a]	N	N	N	N

Sources: U.S. Environmental Protection Agency 2012b; California Air Resources Board 2011b.
N = Nonattainment.
M = Maintenance.
A/U = Attainment/Unclassified.
[a] Applies only to a portion of the air basin that the study area crosses.

22.2 Regulatory Setting

The study area is subject to air quality regulations developed and implemented at the federal, state, and local levels. At the federal level, the U.S. Environmental Protection Agency (EPA) is responsible for implementation of the Clean Air Act (CAA). Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by EPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Responsibility for attaining and maintaining air quality in California is divided between ARB and regional air quality districts. Areas of control for the regional districts are set by ARB, which divides the state into air basins. Plans, policies, and regulations relevant to the alternatives are discussed below.

22.2.1 Federal Plans, Policies, and Regulations

The following federal regulations related to air quality may apply to implementation of some aspects of the BDCP water conveyance facility and the conservation measures. The regulations act as performance standards for engineers and construction contractors; their implementation is considered an environmental commitment of the agencies implementing the BDCP. This commitment is discussed further in Appendix 3B, *Environmental Commitments.*

22.2.1.1 Criteria Pollutants

Clean Air Act and National Ambient Air Quality Standards

The federal CAA, promulgated in 1963 and amended several times thereafter, including the 1990 Clean Air Act amendments (CAAA), establishes the framework for modern air pollution control. The act directs the EPA to establish NAAQS for the six criteria pollutants (discussed in Section 22.1.2). The NAAQS are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life. Table 22-5 summarizes the NAAQS.

Table 22-5. National and California Ambient Air Quality Standards

Pollutant	Symbol	Average Time	Standard (ppm) California	Standard (ppm) National	Standard (μg/m³) California	Standard (μg/m³) National	Violation Criteria California	Violation Criteria National
Ozone*	O_3	1 hour	0.09	–	180	–	If exceeded	–
		8 hours	0.070	0.075	137	147	If exceeded	If fourth-highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor in an area
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	–	7,000	–	If equaled or exceeded	–
Nitrogen dioxide	NO_2	Annual arithmetic mean	0.030	0.053	57	100	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.18	0.100	339	188	If exceeded	–
Sulfur dioxide	SO_2	24 hours	0.04	0.14	105	365	If exceeded	–
		1 hour	0.25	0.075	655	196	If exceeded	If exceeded on more than 1 day per year
		3 hours	–	0.50*	–	1,300*	–	–
		Annual arithmetic mean	–	0.030	–	80	–	If exceeded on more than 1 day per year
Hydrogen sulfide	H_2S	1 hour	0.03	–	42	–	If equaled or exceeded	–
Vinyl chloride	C_2H_3Cl	24 hours	0.01	–	26	–	If equaled or exceeded	–
Inhalable particulate matter	PM10	Annual arithmetic mean	–	–	20	–	–	–
		24 hours	–	–	50	150	If exceeded	If exceeded on more than 1 day per year
	PM2.5	Annual arithmetic mean	–	–	12	15	–	If 3-year average from single or multiple community-oriented monitors is exceeded
		24 hours	–	–	–	35	–	If 3-year average of 98th percentile at each population-oriented monitor in an area is exceeded
Sulfate particles	SO_4	24 hours	–	–	25	–	If equaled or exceeded	–
Lead particles	Pb	Calendar quarter	–	–	–	1.5	–	If exceeded no more than 1 day per year
		30-day average	–	–	1.5	–	If equaled or exceeded	–
		Rolling 3-month average	–	–	–	0.15	If equaled or exceeded	Averaged over a rolling 3-month period

Source: California Air Resources Board 2012.
* = secondary standard.
ppm = parts per million.
μg/m³ = micrograms per cubic meter.

The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for federal standards. The SIP, which is reviewed and approved by EPA, must demonstrate how the federal standards would be achieved. Failing to submit a plan or secure approval can lead to denial of federal funding and permits. In cases where the SIP is submitted by the state but fails to demonstrate achievement of the standards, EPA is directed to prepare a federal implementation plan.

General Conformity Regulation

EPA enacted the federal General Conformity regulation (40 CFR Parts 5, 51, and 93) in 1993. The purpose of the General Conformity rule is to ensure that federal actions do not generate emissions that interfere with state and local agencies' SIPs and emission-reduction strategies to ensure attainment of the NAAQS.

The General Conformity rule applies to all federal actions located in nonattainment and maintenance areas that are not exempt from General Conformity (are either covered by Transportation Conformity or listed in the rule), are not covered by a Presumed-to-Conform approved list[1], or do not have clearly *de minimis* emissions. In addition, the General Conformity rule applies only to direct and indirect emissions associated with the portions of any federal action that are subject to New Source Review (i.e., do not include stationary industrial sources requiring air quality permits from local air pollution control agencies) for which a federal permitting agency has directly caused or initiated, has continued program responsibility for, or can practically control. Because of the involvement of the Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS), all direct and indirect emissions generated by the construction and operation are subject to General Conformity.

The alternatives would generate air pollutant emissions from activities located within the SVAB, SJVAB, and SFBAAB. As shown in Table 22-4, one or more of these basins is classified as a federal nonattainment and/or maintenance area with respect to ozone, CO, PM10, and PM2.5. Consequently, a conformity evaluation must be undertaken to determine whether all emission sources (e.g., haul trucks, off-road equipment) that operate on BDCP components are subject to the General Conformity rule. Because the alternatives are neither exempt nor presumed to conform and are not subject to transportation conformity, the evaluation of whether the alternatives are subject to the General Conformity rule is made by comparing all annual emissions to the applicable General Conformity *de minimis* thresholds (Tables 22-6 and 22-7). If the conformity evaluation indicates that emissions are in excess of any of the General Conformity *de minimis* thresholds, the applicant must perform a conformity determination. A conformity determination is made by satisfying any of the following requirements.

- Showing that the emission increases caused by the federal action are included in the SIP.
- Demonstrating that the State agrees to include the emission increases in the SIP.
- Offsetting the action's emissions in the same or nearby area.
- Mitigating to reduce the emission increase.

[1] Category of activities designated by a Federal agency as having emissions below *de minimis* levels or otherwise do not interfere with the applicable SIP or the attainment and maintenance of the national ambient air quality standard.

- Utilizing a combination of the above strategies.

Table 22-6. Federal *de minimis* Threshold Levels for Criteria Pollutants in Nonattainment Areas (tons per year)

Pollutant	Emission Rate (tons per year)
Ozone (ROG/VOC or NO_X)	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Other ozone nonattainment areas outside an ozone transport region[1]	100
Other ozone nonattainment areas inside an ozone transport region[1]	
ROG/VOC	50
NO_X	100
CO: All nonattainment areas	100
SO_2 or NO_2: All nonattainment areas	100
PM10	
Moderate nonattainment areas	100
Serious nonattainment areas	70
PM2.5	
Direct emissions	100
SO_2	100
NO_X (unless determined not to be a significant precursor)	100
ROG/VOC or ammonia (if determined to be significant precursors)	100
Pb: All nonattainment areas	25

Source: 40 CFR 93.153.

Notes: *de minimis* threshold levels for conformity applicability analysis.

Ozone Transport Region consists of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, the Consolidated Metropolitan Statistical Area that includes the District of Columbia and northern Virginia (Section 184 of the Clean Air Act).

Underlined text indicates pollutants for which the region is in non-attainment, and a conformity evaluation must be made.

In the event that emissions associated with the alternatives exceed the General Conformity *de minimis* thresholds, the BDCP proponents will consult with the local applicable air quality management or pollution control district to ensure conformity determination is made.

Federal Tailpipe Emission Standards

To reduce emissions from off-road diesel equipment, onroad diesel trucks, and harbor craft, EPA established a series of increasingly strict emission standards for new engines. New construction equipment used for the project, including heavy-duty trucks, off-road construction equipment, tugboats, and barges, will be required to comply with the emission standards.

Table 22-7. Federal de minimis Threshold Levels for Criteria Pollutants in Maintenance Areas (tons per year)

Pollutant	Emission Rate (tons per year)
Ozone (NO_X, SO_2, or NO_2)	
All maintenance areas	100
Ozone (ROG/VOC)	
Maintenance areas inside an ozone transport region[1]	50
Maintenance areas outside an ozone transport region[1]	100
CO: All maintenance areas	100
PM10: All maintenance areas	100
PM2.5	
Direct emissions	100
SO_2	100
NO_X (unless determined not to be a significant precursor)	100
ROG/VOC or ammonia (if determined to be significant precursors)	100
Pb: All maintenance areas	25

Source: 40 CFR 93.153.

Notes: *de minimis* threshold levels for conformity applicability analysis.

Ozone Transport Region consists of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, the Consolidated Metropolitan Statistical Area that includes the District of Columbia and northern Virginia (Section 184 of the Clean Air Act).

Underlined text indicates pollutants for which the region is in maintenance, and a conformity determination must be made.

22.2.1.2 Greenhouse Gases

Mandatory Greenhouse Gas Reporting Rule (2009)

On September 22, 2009, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), which required EPA to develop "mandatory reporting of greenhouse gasses above appropriate thresholds in all sectors of the economy…" The Reporting Rule would apply to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also would mandate recordkeeping and administrative requirements in order for EPA to verify annual GHG emissions reports.

Environmental Protection Agency Endangerment and Cause and Contribute Findings (2009)

On December 7, 2009, EPA signed the Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the CAA. Under the Endangerment Finding, EPA finds 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. Under the Cause or Contribute Finding, EPA finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing EPA's proposed new corporate average fuel economy standards for light-duty vehicles, which EPA proposed in a joint proposal including the Department of Transportation's proposed corporate average fuel-economy standards.

Climate Change Considerations in Project-Level NEPA Analysis (2009)

This document provides initial Forest Service guidance on how to consider climate change and GHG emissions in project-level NEPA documents. While the guidance focuses on how Forest Service management may influence climate change, the document describes scoping issues related to GHG analyses and identifies models that can be used to quantify GHG emissions from Forest Service projects. The guidance will be revised as more scientific literature is published, climate change management experience is gained, and government policies are established.

CEQ's Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (2010)

On February 19, 2010, the Council on Environmental Quality (CEQ) issued draft National Environmental Policy Act (NEPA) guidance on the consideration of the effects of climate change and GHG emissions. This guidance advises federal agencies that they should consider opportunities to reduce GHG emissions caused by federal actions, adapt their actions to climate change effects throughout the NEPA process, and address these issues in their agency NEPA procedures. Where applicable, the scope of the NEPA analysis should cover the GHG emissions effects of a proposed action and alternative actions, as well as the relationship of climate change effects on a proposed action or alternatives. The CEQ guidance is still considered draft as of the writing of this document and is not an official CEQ policy document (Council on Environmental Quality 2010).

22.2.2 State Plans, Policies, and Regulations

The following state regulations related to air quality may apply to implementation of some aspects of the BDCP water conveyance facility and the conservation measures. The regulations act as performance standards for engineers and construction contractors; their implementation is considered an environmental commitment of the agencies implementing the BDCP. This commitment is discussed further in Appendix 3B, *Environmental Commitments.*

22.2.2.1 Criteria Pollutants

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than the NAAQS and incorporate additional standards for SO_4, H_2S, and C_2H_3Cl, and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 22-5.

ARB and local air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to ARB, which, in turn, has delegated that authority to individual air districts. ARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

Statewide Truck and Bus Regulation

Originally adopted in 2005, the onroad truck and bus regulation requires heavy trucks to be retrofitted with PM filters. The regulation applies to privately and federally owned diesel fueled trucks with a gross vehicle weight rating (GWR) greater than 14,000 pounds. Compliance with the regulation can be reached through one of two paths: 1) vehicle retrofits according to engine year or 2) phase-in schedule. Both compliance paths ensure that by January 2023, nearly all trucks and buses will have 2010 model year engines or newer.

State Tailpipe Emission Standards

To reduce emissions from off-road diesel equipment, onroad diesel trucks, and harbor craft, ARB established a series of increasingly strict emission standards for new engines. New construction equipment used for the project, including heavy duty trucks, off-road construction equipment, tugboats, and barges, will be required to comply with the standards.

State Nitrogen Oxide Reduction Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between ARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program.

22.2.2.2 Toxic Air Containments

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). In the early 1980s, the ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health threat, and facility plans to reduce these threats.

In August 1998, the ARB identified particulate emissions from diesel-fueled engines as TACs. In September 2000, the ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles (California Air Resources Board 2000). The goal of the plan is to reduce diesel PM10 (respirable particulate matter) emissions and the associated health threat by 75% in 2010 and by 85% by 2020. The plan identifies 14 measures that target new and existing onroad vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). ARB will implement over the plan next several years. The Tanner Act sets forth a formal procedure for the ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before the ARB designates a substance as a TAC. To date, the ARB has identified 21 TACs, and has also adopted the EPA's list of HAPs as TACs. In August 1998, DPM was added to the ARB list of TACs (California Air Resources Board 1998).

The Hot Spots Act requires that existing facilities that emit toxic substances above specified levels complete the following.

- Prepare a toxic emission inventory.
- Prepare a risk assessment if emissions are significant (i.e., 10 tons per year or on District's Health Risk Assessment [HRA] list).
- Notify the public of significant risk levels.
- Prepare and implement risk reduction measures.

The ARB has adopted several regulations that will reduce diesel emissions from in-use vehicles and engines throughout California. For example, ARB adopted an idling regulation for onroad diesel-fueled commercial vehicles in July 2004 and updated in October 2005. The regulation applies to public and privately owned trucks with a GWR greater than 10,000 pounds. Vehicles subject to the regulation are prohibited from idling for more than 5 minutes in any one location. ARB also adopted a regulation for diesel-powered construction and mining vehicles operating. Fleet owners are subject to retrofit or accelerated replacement/repower requirements for which ARB must obtain authorization from EPA prior to enforcement. The regulation also imposes a five minute idling limitation on owners, operators, and renters or lessees of off-road diesel vehicles. In some cases, the particulate matter reduction strategies also reduce smog-forming emissions such as NO_X. As an ongoing process, the ARB reviews air contaminants and identifies those that are classified as TACs. The ARB also continues to establish new programs and regulations for the control of TACs, including DPMs, as appropriate.

22.2.2.3 Greenhouse Gases

Executive Order S-3-05 (2005)

Signed by Governor Arnold Schwarzenegger on June 1, 2005, Executive Order S-3-05 asserts that California is vulnerable to the effects of climate change. To combat this concern, Executive Order S-3-05 established the following GHG emissions reduction targets for state agencies.

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

Executive orders are binding only on state agencies. Accordingly, EO S-03-05 will guide state agencies' efforts to control and regulate GHG emissions but will have no direct binding effect on local government or private actions. The Secretary of the California Environmental Protection Agency (CalEPA) is required to report to the Governor and state legislature biannually on the impacts of global warming on California, mitigation and adaptation plans, and progress made toward reducing GHG emissions to meet the targets established in this executive order.

Senate Bills 1078/107/2 and Executive Order S-14-08—Renewables Portfolio Standard (2002, 2006,2011)

Senate Bills (SB) 1078 and 107, California's Renewables Portfolio Standard (RPS), obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are jointly responsible for implementing the program. EO S-14-08 set forth a longer range target of procuring 33% of retail sales by 2020. SB 2 (2011) requires a RPS of 33% by 2020.

Assembly Bill 1493—Pavley Rules (2002, Amendments 2009)

Known as "Pavley I," AB 1493 standards are the nation's first GHG standards for automobiles. AB 1493 requires the ARB to adopt vehicle standards that will lower GHG emissions from new light duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as "Pavley II", now referred to as the "Advanced Clean Cars" measure) has been proposed for vehicle model years 2017–2020. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14%. In June 2009, the EPA granted California's waiver request enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

The EPA and ARB are currently working together to on a joint rulemaking to establish GHG emissions standards for 2017 to 2025 model-year passenger vehicles. The Interim Joint Technical Assessment Report for the standards evaluated four potential future standards ranging from 47 and 62 miles per gallon in 2025. The EPA and ARB were still working on this proposal as of February 2012.

Assembly Bill 32, California Global Warming Solutions Act (2006)

In September 2006, the California State Legislature adopted Assembly Bill 32, the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes a cap on statewide GHG emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emission levels. Under AB 32, ARB is required to take the following actions.

- Adopt early action measures to reduce GHGs.
- Establish a statewide GHG emissions cap for 2020 based on 1990 emissions.
- Adopt mandatory reporting rules for significant GHG sources.
- Adopt a scoping plan indicating how emission reductions would be achieved through regulations, market mechanisms, and other actions.

- Adopt regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHGs.

Executive Order S-01-07, Low Carbon Fuel Standard (2007)

Executive Order S-01-07 mandates: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a low carbon fuel standard (LCFS) for transportation fuels be established in California. The executive order initiates a research and regulatory process at ARB. Based on an implementation plan developed by CEC, ARB will be responsible for implementing the LCFS. On December 29, 2011, a federal judge issued a preliminary injunction blocking enforcement of the LCFS, ruling that the LCFS violates the interstate commerce clause (Georgetown Climate Center 2012). CARB has appealed this ruling.

Executive Order S-13-08, Adaptation to Climate Change (2008)

Executive Order S-13-08, issued November 14, 2008 directs the California Natural Resources Agency, Department of Water Resources, Office of Planning and Research, Energy Commission, State Water Resources Control Board, State Parks Department, and California's coastal management agencies to participate in a number of planning and research activities to advance California's ability to adapt to the impacts of climate change. The order specifically directs agencies to work with the National Academy of Sciences to initiate the first California Sea Level Rise Assessment and to review and update the assessment every two years after completion; immediately assess the vulnerability of the California transportation system to sea level rise; and to develop a California Climate Change Adaptation Strategy.

Climate Change Scoping Plan (2008)

On December 11, 2008, pursuant to AB 32, ARB adopted the Climate Change Scoping Plan. This plan outlines how emissions reductions from significant sources of GHGs will be achieved via regulations, market mechanisms, and other actions. Six key elements are identified to achieve emissions reduction targets.

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards.
- Achieving a statewide renewable energy mix of 33%.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

The Climate Change Scoping Plan also describes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately affect low-income and minority communities. These measures put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80% below 1990 levels.

In March 2011, a San Francisco Superior Court enjoined the implementation of ARB's Scoping Plan, finding the alternatives analysis and public review process violated both CEQA and ARB's certified regulatory program (*Association of Irritated Residents, et al v. California Air Resources Board*). In response to this litigation, the ARB adopted a *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* on August 24, 2011. ARB staff re-evaluated the statewide GHG baseline in light of the economic downturn and updated the projected 2020 emissions to 507 million metric tons CO_2e. Two reduction measures (Pavley I and the Renewable Portfolio Standard) not previously included in the 2008 Scoping Plan baseline were incorporated into the updated baseline. According to the *Final Supplement*, the majority of additional measures in the Climate Change Scoping Plan have been adopted (as of 2012) and are currently in place (California Air Resources Board 2011c).

California Climate Change Adaptation Strategy (2009)

In cooperation and partnership with multiple state agencies, the 2009 California Climate Adaptation Strategy summarizes the best known science on climate change impacts in seven specific sectors (public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture; forestry, and transportation and energy infrastructure) and provides recommendations on how to manage against those threats. The California Natural Resources Agency is currently in the process of updating the 2009 strategy for 2012.

State CEQA Guidelines

As revised pursuant to Senate Bill 97 adopted in 2007 (Cal PRC § 21083.05), the State CEQA Guidelines, effective in mid-2010, require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. Moreover, the State CEQA Guidelines emphasize the necessity to determine potential climate change effects of the project and propose mitigation as necessary. The State CEQA Guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an environmental impact report (EIR) if "there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or requirements" (Section 15064.4).

State CEQA Guidelines section 15126.4 includes considerations for lead agencies related to feasible mitigation measures to reduce GHG emissions, which may include, among others, measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision; implementation of project features, project design, or other measures which are incorporated into the project to substantially reduce energy consumption or GHG emissions; offsite measures, including offsets that are not otherwise required, to mitigate a project's emissions; and, measures that sequester carbon or carbon-equivalent emissions.

Greenhouse Gas Cap-and-Trade Program

On October 20, 2011, ARB adopted the final cap-and-trade program for California. The California cap-and-trade program will create a market-based system with an overall emissions limit for affected sectors. The program is currently proposed to regulate more than 85% of California's emissions and will stagger compliance requirements according to the following schedule: (1)

electricity generation and large industrial sources (2012); (2) fuel combustion and transportation (2015).

Technical Advisory Information

This section summarizes two technical advisories on CEQA and climate change. The documents are provided for informational purposes only; certain sections of the below guidance may be superseded by more recent regulations (e.g., SB 97).

Office of Planning and Research Advisory on CEQA and Climate Change

In June 2008, the Office of Planning and Research (OPR) Advisory published a technical advisory entitled "CEQA and Climate Change: Addressing Climate Change through CEQA" (OPR Advisory). This guidance, which is purely advisory, proposes a three-step analysis of GHG emissions. The advice, moreover, is not the most recent expression of state policy on the subject, as it preceded in time the enactment in 2010 of modifications to the CEQA Guidelines addressing how to deal with greenhouse gas emissions in CEQA documents.

1. Mandatory Quantification of GHG Project Emissions. The environmental impact analysis must include quantitative estimates of a project's GHG emissions from different types of air emission sources. These estimates should include both construction-phase emissions, as well as completed operational emissions, using one of a variety of available modeling tools.[2]

2. Continued Uncertainty Regarding "Significance" of Project-Specific GHG Emissions. Each EIR document should assess the significance of the project's impacts on climate change. The OPR Advisory recognizes uncertainty regarding what GHG impacts should be determined to be significant and encourages agencies to rely on the evolving guidance being developed in this area. According to the OPR Advisory, the environmental analysis should describe a "baseline" of existing (pre-project) environmental conditions and then add project GHG emissions on to this baseline to evaluate if impacts are significant.

3. Mitigation Measures. According to the OPR Advisory, "all feasible" mitigation measures or project alternatives should be adopted if an impact is significant (feasibility is defined in relation to scientific, technical, and economic factors). If mitigation measures cannot sufficiently reduce project impacts, the agency should adopt those measures that are feasible and include a fact-based explanation in the EIR of why additional mitigation is not feasible. OPR also identifies a menu of GHG emission mitigation measures, ranging from balanced "mixed use" master-planned project designs to construction equipment and material selection criteria and practices. Not all of those mitigation measures apply in every situation.

22.2.2.4 Environmental Justice Compliance and Enforcement Working Group

The California Environmental Protection Agency created the Environmental Justice Compliance and Enforcement Working Group in 2013. The working group coordinates compliance and enforcement

[2] Note that CEQA Guidelines section 15064.4 supersedes OPR's 2008 advice on the issue of quantification. Section 15064.4 provides that a lead agency has the discretion to determine, in the context of a particular project, whether to use a model or methodology to quantify greenhouse gas emissions or to rely on a qualitative analysis or performance based standards.

of state environmental laws in California communities that are most affected by pollution. Members include the enforcement chiefs from CalEPA, the Department of Toxics Substances Control, the Department of Pesticide Regulation, CalRecycle, the Air Resources Board and the State Water Resources Control Board, as well as a representative from the Office of Environmental Health Hazard Assessment.

22.2.3 Regional and Local Plans, Policies, and Regulations

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

ARB's Climate Change Scoping Plan states that local governments are "essential partners" in the effort to reduce GHG emissions. The Climate Change Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The Climate Change Scoping Plan encourages local governments to reduce GHG emissions by approximately 15% from current levels by 2020.

The air quality study area falls under the jurisdiction of four air districts: Yolo-Solano Air Quality Management District (YSAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), Bay Area Air Quality Management District (BAAQMD), and San Joaquin Valley Air Pollution Control District (SJVAPCD). The following local policies related to air quality may apply to implementation of some aspects of the BDCP water conveyance facility and the conservation measures. The regulations act as performance standards for engineers and construction contractors; their implementation is considered an environmental commitment of the agencies implementing the BDCP. This commitment is discussed further in Appendix 3B, *Environmental Commitments.*

22.2.3.1 Criteria Pollutants

Yolo-Solano Air Quality Management District

YSAQMD has local air quality jurisdiction over the action components located in Yolo County. YSAQMD has adopted CEQA emission thresholds in the *Handbook for Assessing and Mitigating Air Quality Impacts* (Yolo-Solano Air Quality Management District 2007) to assist lead agencies in determining the level of significance of project-related emissions. According to the YSAQMD handbook, emissions that exceed the recommended threshold levels are considered potentially significant and should be mitigated where feasible.

Under the CCAA, YSAQMD is required to develop an air quality plan for nonattainment criteria pollutants in the air district. The 1994 Sacramento Area Regional Ozone Attainment Plan was prepared to address VOC and NO_X emissions following the region's serious nonattainment designation for the 1-hour ozone NAAQS in November 1991. The Sacramento Regional 8-Hour Attainment and Reasonable Further Progress Plan has also been adopted to address the region's nonattainment status for the 8-hour ozone NAAQS. Air districts within the Sacramento Federal Nonattainment Area (SFNA) have submitted the ozone plan to the EPA and are currently waiting for the agency to approve the document. Counties in the SFNA (Sacramento, Yolo, Placer, El Dorado, Solano, Sutter, and Butte) have also adopted the Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan (2009 Plan) (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2010). This plan outlines strategies to achieve the health-based ozone standard. The Sacramento region is also in the process of developing a plan to address PM.

All activities located in Yolo County are subject to the YSAQMD regulations in effect at the time of construction. Specific regulations applicable to the alternatives may involve diesel construction equipment emissions, fugitive dust, onroad haul truck emissions, and general permit requirements. Below are descriptions of YSAQMD rules that may apply to the project. This list of rules may not be all encompassing as additional YSAQMD rules may apply to the alternatives as specific components are identified.

- Rule 2.5 (Nuisance). This rule prevents dust emissions from creating a nuisance to surrounding properties.
- Rule 2.11 (Particulate Matter Concentration). This rule restricts emissions of PM greater than 0.1 grain per cubic foot of gas at dry standard conditions.
- Rule 2.28 (Cutback and Emulsified Asphalt Paving Materials). This rule limits the application of cutback and emulsified asphalt.
- Rule 2.32 (Stationary Internal Combustion Engines). This rule requires portable equipment greater than 50 horsepower, other than vehicles, to be registered with either ARB Portable Equipment Registration Program (PERP) or with YSAQMD.

Sacramento Metropolitan Air Quality Management District

SMAQMD has local air quality jurisdiction over the action components located in Sacramento County. Similar to YSAQMD, SMAQMD has adopted the 1994 Sacramento Area Regional Ozone Attainment Plan, Sacramento Regional 8-Hour Attainment and Reasonable Further Progress Plan (currently under revision), the 2009 Plan, and advisory CEQA emission thresholds to assist CEQA lead agencies in determining the level of significance of project-related emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recommended CEQA thresholds are outlined in its *Guide to Air Quality Assessment in Sacramento County.* The air district also has established rules and regulations, of which the following may apply to the alternatives. This list of rules may not be all encompassing as additional SMAQMD rules may apply to the alternatives as specific components are identified.

- Rule 2020 (Nuisance). This rule prevents criteria pollutants from creating a nuisance to surrounding properties.
- Rule 403 (Fugitive Dust). This rule controls fugitive dust emissions through implementation of BMPs.
- Rule 404 (Particulate Matter). This rule restricts emissions of PM greater than 0.23 grams per cubic meter.
- Rule 412 (Stationary Internal Combustion Engines). This rule controls emissions of NO_X, CO, and non-methane hydrocarbons from stationary internal combustion engines greater than 50 brake horsepower.

- Rule 453 (Cutback and Emulsified Asphalt Paving). This rule limits the application of cutback and emulsified asphalt.

SMAQMD requires development projects implement all feasible mitigation measures to reduce potential impacts to air quality. If traditional, onsite mitigation (e.g., engine retrofits) are not sufficient to reduce adverse impacts, DWR may contribute to SMAQMD's Heavy-Duty Low-Emission Vehicle Incentive Programs (HDLEVIP), which include the Carl Moyer and Sacramento Emergency Clean Air Transportation (SECAT) Programs. The HDLEVIP and associated incentive programs are managed and implemented by the SMAQMD on behalf of all air districts within the SFNA (e.g., YSAQMD, Feather River Air Quality Management District, Placer County Air Pollution Control District). More than $7 million are awarded annually to emissions reduction projects through the HDLEVIP.

The HDLEVIP and associated incentive programs are a means of generating revenue to fund projects and programs capable of achieving emissions reductions. The Carl Moyer program is designed to reduce ROG, NO_X, and PM from on- and offroad sources, whereas the SECAT program primarily targets NO_X from heavy-duty onroad trucks The payment fee for the Carl Moyer Program is currently $17,460 per ton, in addition to a 5% administration fee. Project applicants relying on the Carl Moyer Program to reduce adverse air quality impacts must 1) calculate the offsite mitigation fee required to reduce project-level emissions to below applicable thresholds, and 2) include the mitigation fee in the environmental document, project approval conditions, and in the MMRP. Fees collected by the SMAQMD are used to fund reduction projects within the SFNA. Example projects funded through the Carl Moyer Program include the following.

- Independent Construction Caterpillar 633D Scraper Tier 2 Engine Repower
- Kiewit Pacific Construction Caterpillar 16G Grader Diesel Catalyst Retrofit
- Commercial Low-Emission Propane Generator
- American Engineering & Asphalt Caterpillar 825C Compactor Tier 2 Engine Repower
- B&D Geerts Construction Caterpillar 826C Compactor Tier 1 Engine Repower

The SECAT program differs from the Carl Moyer Program in that it can only fund projects for on-road vehicles. However, the SECAT program can also finance operational emissions reductions, including facility modifications and out-of-cycle replacements; the Carl Moyer Program is only available to fund the incremental capital costs of control measures.

Bay Area Air Quality Management District

BAAQMD has local air quality jurisdiction over the action components located in Contra Costa and Alameda Counties. Like YSAPCD and SMAQMD, the BAAQMD (2011) has adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions, which are outlined in its *California Environmental Quality Act Air Quality Guidelines*. BAAQMD has also adopted air quality plans to improve air quality, protect public health, and protect the climate The Bay Area 2001 Ozone Attainment Plan was adopted to reduce ozone and achieve the NAAQS ozone standard. BAAQMD also adopted a resignation plan for CO in 1994. The resignation plan includes strategies to ensure the continuing attainment of the NAAQS for CO in the SFBAAB.

The BAAQMD also supports incentive programs to reduce criteria pollutant emissions within the district. Similar to SMAQMD, the BAAQMD's Carl Moyer Program funds control projects for offroad and onroad emission sources. The Transportation Fund for Clean Air (TFCA) Program likewise provides financial incentives for onroad vehicle retrofits.

The alternatives may be subject to the following district rules. This list of rules may not be all encompassing as additional BAAQMD rules may apply to the alternatives as specific components are identified.

- Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminates). This regulation outlines guidance for evaluating TAC emissions and their potential health threats.
- Regulation 6, Rule 1 (Particulate Matter). This regulation restricts emissions of PM darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- Regulation 8, Rule 15 (Emulsified and Liquid Asphalts). This regulation limits emissions of VOCs caused by paving materials.
- Regulation 9, Rule 8 (Stationary Internal Combustion Engines). This regulation limits emissions of NO_X and CO from stationary internal combustion engines of more than 50 horsepower.

San Joaquin Valley Air Pollution Control District

SJVAPCD has local air quality jurisdiction over the action components located in San Joaquin, Stanislaus, and Merced Counties. SJVAPCD's recommended CEQA thresholds are outlined in its *Guide for Assessing and Mitigating Air Quality Impacts.* Pursuant to the CCAA, SJVAPCD has adopted attainment plans to address ozone, PM, and CO. The 2007 Ozone Plan contains a comprehensive list of regulatory and incentive-based measures to reduce VOC and NO_X emissions within the SJVAB. In particular, plan purposes a 75% reduction in NO_X and 25% reduction in VOC by 2023. SJVAPCD's 2007 PM10 Maintenance Plan and 2008 PM2.5 Plan likewise include strategies to reduce PM emissions throughout the air basin. Finally, the 2004 California State Implementation Plan for Carbon Monoxide addresses CO emissions throughout the state.

The alternatives may be subject to the following district rules. This list of rules may not be all encompassing, as additional SJVAPCD rules may apply to the alternatives as specific components are identified. These are rules that have been adopted by SJVAPCD to reduce emissions throughout the San Joaquin Valley.

- Rule 2201 (New and Modified Stationary-Source Review Rule). This rule applies to all new stationary sources and all modifications to existing stationary sources subject to SJVAPCD permit requirements that, after construction, emit or may emit one or more pollutants regulated by the rule.
- Rule 3135 (Dust Control Plan Fees). This rule requires the applicant to submit a fee in addition to a dust control plan. The purpose of this rule is to recover SJVAPCD's cost for reviewing these plans and conducting compliance inspections.
- Rule 4101 (Visible Emissions). This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.
- Rule 4102 (Nuisance). This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and subject to SJVAPCD enforcement action.

- Rule 4641 (Cutback, Slow-Cure, and Emulsified Asphalt, Paving, and Maintenance Operations). This rule applies to the manufacture and use of cutback asphalt, slow-cure asphalt, and emulsified asphalt for paving and maintenance operations.
- Rule 4701 (Internal Combustion Engines—Phase 1). This rule limits the emissions of NO_X, CO, and VOC from internal combustion engines. These limits are not applicable to standby engines as long as they are used fewer than 200 hours per year (e.g., for testing during non-emergencies).
- Rule 4702 (Internal Combustion Engines—Phase 2). This rule limits the emissions of NO_X, CO, and VOC from spark-ignited internal combustion engines.
- Regulation VIII (Fugitive PM10 Prohibitions). This is a series of rules (Rules 8011–8081) designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction, road construction, bulk materials storage, landfill operations, and other activities.

Similar to SMAQMD, SJVAPCD has developed an offsite mitigation program to reduce ROG and NO_X emissions in the SJVAB. SJVAPCD's Voluntary Emission Reduction Agreement (VERA) is implemented through District Incentive Programs and is a measure to reduce project impacts under CEQA. The District Incentive Programs fund grants and projects to achieve emissions reductions in the SJVAB. The SJVAPCD has operated the program since 1992, resulting in considerable criteria pollutant reductions throughout the region. Project applicants relying on the VERA to reduce adverse air quality impacts must 1) calculate the offsite mitigation fee required to reduce project-level emissions to below applicable thresholds, and 2) include the mitigation fee in the environmental document, project approval conditions, and in the MMRP. Example programs funded through the VERA include the following.

- On-Road Truck Voucher Program
- Burn Clean Program
- Heavy Duty Engine Program
- Cordless Zero-Emission Commercial Lawn & Garden Equipment Demonstration Program
- Statewide School Bus Retrofit Program

22.2.3.2 Greenhouse Gases

Yolo-Solano Air Quality Management District

YSAQMD has no proposed specific thresholds for GHGs but does recommend that lead agencies include at least a qualitative discussion of potential climate change impacts in the air quality analyses of sizable projects. YSAQMD further advises that the lead agency can require mitigation measures such as building code restrictions, increased public transportation, alternative fuels, or other actions that reduce CO_2 (Yolo Solano Air Quality Management District 2007).

Sacramento Metropolitan Air Quality Management District

SMAQMD's advisory CEQA Guidelines establish analysis expectations with regard to GHG emissions analyses (Sacramento Metropolitan Air Quality Management District 2011). The district recommends environmental documents include a description of GHGs, summarize existing regulations, and discuss GHG emissions sources in the study area. The guidelines further recommend that the analysis quantify GHG emissions associated with project construction and operation.

SMAQMD currently does not recommend a GHG emissions threshold for construction, but encourages the implementation of best management practices (BMPs). The district does recommend, however, that the determination of effects for land use development and stationary source projects consider consistency with AB 32's GHG reduction goals and Scoping Plan.[3]

Bay Area Air Quality Management District

BAAQMD has adopted recommended significance thresholds for operational GHG emissions from land-use development and stationary source projects. These thresholds are intended to reduce GHG emissions from major contributors within the air district. BAAQMD currently does not recommend a GHG emissions threshold for construction, but encourages the implementation of BMPs (Bay Area Air Quality Management District 2011).

San Joaquin Valley Air Pollution Control District

SVJAPCD's GHG guidance is intended to streamline CEQA review by pre-quantifying emissions reductions that would be achieved through the implementation of best performance standards (BPS). Projects are considered to have a less-than-significant cumulative impact on climate change if any of the following conditions are met.

1. Comply with an approved GHG reduction plan.
2. Achieve a score of at least 29[4] using any combination of approved operational BPS.
3. Reduce operational GHG emissions by at least 29% over business-as usual conditions (demonstrated quantitatively).

SJVAPCD guidance recommends quantification of GHG emissions for all projects in which an EIR is required, regardless of whether BPS achieve a score of 29 (San Joaquin Valley Air Pollution Control District 2009).

22.3 Environmental Consequences

22.3.1 Methods for Analysis

The effects of the alternatives on air quality, criteria pollutants, and GHG emissions from construction and operations were assessed and quantified using standard and accepted software tools, techniques, and emission factors. A full list of assumptions used to quantify criteria pollutant

[3] Please note that once fully constructed, the project will not be a land use development or stationary source project, and would therefore likely not be subject to land use development and stationary source guidance recommended by the SMAQMD.

[4] A score of 29 represents a 29% reduction in GHG emissions relative to unmitigated conditions (1 point = 1%). This goal is consistent with the reduction targets established by AB 32.

and GHG emissions can be found in Appendices 22A, *Air Quality Analysis Assumptions,* and 22B, *Air Quality Assumptions*.

22.3.1.1 Construction of the Water Conveyance Facility

Construction of the water conveyance facility (CM1) would generate emissions of criteria pollutants (ROG, NO_X, CO, PM10, PM2.5), and GHGs (CO_2, CH_4, N_2O, and SF_6) that would result in short-term effects on ambient air quality in the air quality study area. Emissions would originate from mobile and stationary construction equipment exhaust, employee vehicle exhaust, dust from land clearing and earthmoving, electrical transmission, and concrete batching from onsite plants. These emissions would be temporary (i.e., limited to the construction period) and would cease when construction activities are completed.

Schedule and Phasing

Construction of the proposed water conveyance facility (CM1) would occur in multiple phases (e.g., mobilization, land clearing). A detailed construction schedule (DWR DHCCP Program Schedule, 20-Oct-11) was developed based on an economic analysis (5RMK, Inc. Bid-Item Detail, 24-Feb-2010) provided by DWR. Construction activities for alternatives with the pipeline/tunnel alignment, modified pipeline/tunnel alignment, east alignment, and through Delta/separate corridors alignment were assumed to proceed according to the schedules listed below. A construction schedule for alternatives with the west alignment was developed based on data received for the east alignment, due to similarities in project design.

- Pipeline/Tunnel Alignment and Modified Pipeline/Tunnel Alignment: February 2016 to December 2024 (9 years).
- East/West Alignment: June 2014 to December 2022 (9 years).
- Through Delta/Separate Corridors Alignment: January 2014 to July 2020 (7 years).

Methods and assumptions used to develop the construction schedule are provided in Appendix 22A, *Air Quality Analysis Assumptions*. Detailed phasing assumptions are presented in Appendix 22B, *Air Quality Assumptions*.

Emissions Modeling

Alternatives 1A, 2A, and 6A (Pipeline/Tunnel Alignment); Alternatives 1B, 2B, and 6B (East Alignment); and Alternative 9 (Through Delta/Separate Corridors Alignment)

Construction emissions from heavy-duty equipment land disturbance were calculated using spreadsheets based on the methodology and default emission factors from the California Emissions Estimator Model (CalEEMod). CalEEMod analyzes the type of construction activity and the duration of the construction period to estimate emissions (GHGs and criteria pollutants). Equipment and construction assumptions were provided by DWR and are discussed in detail in Appendix 22B, *Air Quality Assumptions*. The total area to be disturbed during construction was determined using GIS data provided by DWR, as described in Appendix 22A, *Air Quality Analysis Assumptions*.

Construction of the water conveyance facility would require the use of marine vessels, such as tugboats and barges, and small diesel locomotives during tunneling. Exhaust emissions for marine vessels were quantified using emission factors developed by ICF (2009) and activity data provided by DWR. Emissions from diesel-powered locomotives were quantified using the EPA's nonroad diesel emission standards. Please refer to Appendices 22A, *Air Quality Assumptions,* and 22B, *Air Quality Analysis Assumptions,* for a catalog of marine vessels and locomotive operating hours.

Helicopters would be used during line stringing activities for the 230 kV transmission lines. Two light-duty helicopters were assumed to operate four hours a day to install new poles and lines. Helicopter emissions were estimated using expected fuel consumption (U.S. Department of Interior National Business Center 2006) and emission factors derived from the California Public Utilities Commission (2006 and 2007) and the U.S. Department of Energy (2008). Please refer to Appendix 22A, *Air Quality Assumptions,* for additional modeling information.

Onroad vehicles (e.g., pick-up trucks, flatbeds) would be required for materials hauling and general crew movement, as well as for employee commuting to the project site. Emissions from onroad vehicles were estimated using the EMFAC2011 emissions model and activity data provided by DWR. It was assumed that vehicles used for materials hauling and general crew movement would make a maximum of 8 trips per day, whereas vehicles used for employee commuting would make 2 trips per day. These values represent conservative estimates of vehicle activity and are based on consultation with Fehr & Peers, the project traffic engineer (please refer to Chapter 19 *Transportation,* Sections 19.3.3.2 through 19.3.3.16, for additional information on traffic impacts). Vehicle trip lengths were based on CalEEMod defaults. Additional employee and vehicle information can be found in Appendices 22A, *Air Quality Analysis Assumptions,* and 22B, *Air Quality Assumptions*.

Construction would require a substantial volume of concrete. PM10 and PM2.5 may be emitted during concrete batching through the transfer of aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion. CO_2 emissions would be generated by onsite fuel combustion and cement calcination[5]. PM10 emissions from concrete batching were estimated using emission factors provided the EPA (U.S. Environmental Protection Agency 2006b:11.12-11) and concrete data provided by DWR. Based on consultation with the ARB (Gaffney pers. comm.), CO_2 emissions were calculating by multiplying the volume of concrete required to construct the project by 400 pounds (Portland Cement Association 2011). Additional information on methodology to quantify PM and CO_2 emissions from concrete batching can be found in Appendix 22A, *Air Quality Analysis Assumptions*.

Construction of the water conveyance facility would require the use of electricity for lighting, tunnel ventilation, boring, and certain types of equipment. Annual electric demand for all alternatives was provided by DWR and is summarized Appendix 22A, *Air Quality Analysis Assumptions*. Emissions associated with the generation, transmission, and distribution of this electricity were estimated by multiplying the expected annual electricity usage by regional emission factors developed by EPA (2011a)[6] and University of California, Davis (Delucchi 1996:110). Note that adopted and proposed statewide legislation will increase future energy efficiency and the proportion of renewable energy supplied to the electrical grid. Actual emissions from construction of the proposed action would therefore likely be less than those estimated in this analysis.

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[5] Calcination involves heating raw materials to over 2,500°F, which liberates CO_2 and other trace materials. A portion of the liberated CO_2 is partially reabsorbed into the limestone during the life of the structure.

[6] Power will be supplied to BDCP by multiple utilities. The quantity of power supplied by each utility is currently unknown. Consequently, average statewide emission factors, as opposed to utility-specific factors, were used to quantify emissions associated with electricity consumption.

Alternatives 1C, 2C, and 6C (West Alignment); and Alternatives 3, 5, 7, and 8 (Pipeline/Tunnel Alignment)

Construction emissions associated with these alternatives were calculated by scaling emissions estimates for the east alignment and pipeline/tunnel alignment, taking into consideration similarities between the alternatives. A summary of scaling factors can be found in Appendix 22A, *Air Quality Analysis Assumptions*.

Alternative 4 (Modified Pipeline/Tunnel Alignment)

Emissions associated with construction of the tunnels, Clifton Court Forebay, utilities, canals, and siphons were calculated based on equipment assumptions provided by DWR and the methods described above for the pipeline/tunnel alignment. Emissions associated with construction of the intakes, pumping plants, forebays, control structures, and pipelines were calculated by scaling emissions estimates for the pipeline/tunnel alignment, taking into consideration similarities between the alternatives. A summary of the construction assumptions and scaling factors can be found in Appendix 22A, *Air Quality Analysis Assumptions*.

Emissions by Air District and Air Basin

The alternatives cross three air basins—SFBAAB, SVAB, and SJVAB—and fall under the jurisdiction of four air districts—YSAQMD, SMAQMD, BAAQMD, and SJVAPCD; each of these have adopted their own distinct local thresholds of significance. To compare project generated emissions to the federal and state thresholds (see below), activities occurring within each air district and air basin were quantified and analyzed separately.[7]

Criteria pollutant and GHG emissions occurring within each air district and air basin were identified based on the location and schedule of construction activities. Construction locations were identified using GIS data provided by DWR and are summarized in Appendix 22A, *Air Quality Analysis Assumptions*. Annual emissions estimates were developed by summing emissions that would occur within each year of construction. These emissions were apportioned to each air district based on the location of construction activity. For example, construction of the tunnel in Reach 5 under Alternative 1A would occur in both SMAQMD and SJVAPCD. Construction would be completed in phases between 2017 and 2023. Emissions generated in each year of construction (e.g., 2017, 2018) were calculated using the methods described above. The annual emissions estimates were apportioned to SMAQMD and SJVAPCD based on the number of tunnel miles constructed within each location (see Appendix 22A, *Air Quality Analysis Assumptions*).

Specific information of the actual start and end dates of construction activities was unavailable. Rather, the approximate month and year of construction activities was provided for each phase (e.g., January 2017). Because daily construction activity data was unavailable, construction activities were estimated in monthly segments; construction phases were therefore assumed to occur throughout

[7] The ARB acknowledges that air basins in the Plan area, in particular the SJVAB and SVAB, are both contributors and receptors of pollutant transport throughout the state (California Air Resources Board 2009). While technical documents have been published analyzing the transport relationship amongst California air basins, quantifying the effects of pollutant transport as a result of project implementation would require detailed projections of future climatic and meteorological conditions. Air districts in the Plan area have adopted thresholds and mitigation requirements that commensurate with expected criteria air pollutant contributions from downwind air basins (California Air Resources Board 2011d).

the entirety of a month, even if only one or more actual day of construction fell within that month. This approach assumes construction activities, and thus emissions, occur concurrently within each month. Assuming concurrent construction activity represents a conservative assessment of construction effects since it is likely some phases would occur sequentially. However, without additional information on the specific start and end date of construction, the assumption that construction activity would occur throughout the entirety of a month was required to ensure emissions were not potentially underreported.

22.3.1.2 Operation and Maintenance of the Water Conveyance Facility

Operation of the water conveyance facility would generate long-term (permanent) emissions of criteria pollutants (ROG, NO_X, CO, PM10, PM2.5), and GHGs (CO_2, CH_4, N_2O, and SF_6) that would result in long-term effects on ambient air quality in the air quality study area. Emissions would originate from onroad vehicle exhaust, maintenance equipment exhaust, and electrical generation. A portion of CO_2 emissions generated by calcination during cement manufacturing will also be absorbed into the limestone of concrete structures during the life of the project, as described below.

Operations and maintenance include both routine activities and major inspections. Routine activities would occur on a daily basis throughout the year, whereas major inspections would occur annually. Emissions associated with vehicle traffic and maintenance equipment were estimated using the EMFAC2011 and CalEEMod models, respectively. Emissions were quantified for both 2025 conditions and 2060 conditions. Information on personnel and equipment currently required for O&M is unavailable. Consequently, the analysis assumes emissions associated with vehicle traffic and equipment are zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). This approach represents a worst case scenario as the net impact of the project will be higher under zero baseline conditions. Detailed assumptions used in the emissions modeling are provided in Appendix 22A, *Air Quality Analysis Assumptions*.

Long-term operation of the water conveyance facility would require the use of electricity for pumping and maintenance, which would result in emissions from the generation, distribution, and transmission of this electricity. Increases in annually electric consumption for all alternatives relative to the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline) were calculated in Chapter 21, *Energy,* Section 21.3.1.2. Criteria pollutant and GHG emissions generated by increased electricity consumption were calculated using the emission factors summarized in Appendix 22A, *Air Quality Analysis Assumptions*.

Emissions benefits from CO_2 absorption associated with concrete use were calculated using information provided by Portland Cement Association (Portland Cement Association 2011). Over the lifetime of a concrete structure, approximately 57% of the CO_2 emitted during calcination will be reabsorbed into the limestone of the structure. Roughly 50% of these emissions will be absorbed once the structure is demolished and returned to fine particles (typically through recycling). To account for the partial reabsorption of CO_2 during the life of the structure, emissions generated by calcination were multiplied by 7%. Because 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions. CO_2 emissions reabsorbed by concrete recycling (50%) were not quantified since project demolition is outside the scope of the analysis.

22.3.1.3 Toxic Air Contaminants

A HRA was conducted to assess the threats associated with TAC emissions. The HRA analyzed the human health threats associated with construction of each BDCP alternative. Construction emissions include TACs generated by diesel and gasoline fuel combustion. In addition to analyzing TAC emissions, the HRA also evaluated PM2.5 and PM10 concentrations resulting from both diesel and gasoline combustion, and from fugitive dust generation.

The analysis of health threats is based on guidance and methodologies recommended by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment's (OEHHA) *Air Toxic Hot Spots Program Risk Assessment Guidelines* (OEHHA 2003; 2009; 2012) and on significance thresholds established by the affected air districts. This assessment uses the OEHHA methodology to characterize cancer risks and non-cancer hazards from inhaled DPM.

In addition, for two of the air districts–SJVAPCD and BAAQMD-incremental concentrations of PM2.5 were assessed against significance thresholds established by those air districts. For the YSAQMD and the SMAQMD, concentrations of PM2.5 were not assessed against the ambient air quality standards because these air districts have not established CEQA-specific PM2.5 concentration thresholds. Instead, the YSAQMD and SMAQMD rely on mass emission thresholds of PM10 (PM2.5 is a subset of PM10) that is sufficient as the significance threshold for particulate matter emissions (Jones pers. comm. A and B; Huss and Dubose pers. comm.)

The degree of public exposure to DPM was estimated under the exposure assessment portion of the HRA. This portion of the analysis estimated the DPM concentrations for sensitive receptors located near the BDCP construction areas. The analysis was conducted by first estimating the DPM emissions that would be generated by each alternative's construction areas. Then, air quality dispersion modeling was used to estimate DPM concentrations at nearby sensitive locations.

The HRA considers the following three types of health threats:

- Chronic non-cancer hazard (averaging period equivalent to the exposure duration)
- Cancer risk (70-year ["lifetime"] averaging period)

There is limited information that characterizes non-cancer toxicity from acute exposure to DPM (OEHHA and ARB 2013). The estimation of non-cancer health hazards is evaluated using predicted pollutant concentrations and agency-established reference exposure levels (RELs). RELs are designed to protect sensitive individuals within the population. Unlike cancer health effects, non-cancer health effects are generally assumed to have thresholds for adverse effects. In other words, injury from a pollutant will not occur until exposure to that pollutant has reached or exceeded a certain concentration threshold. However, no REL currently exists to evaluate acute health hazards associated with DPM. While acute exposure to DPM can lead to respiratory symptoms, neurophysiological symptoms, and acute irritation, there is insufficient exposure-response information from available acute health-effect studies to allow for the development of RELs to evaluate health hazards associated with acute DPM exposure (U.S. Environmental Protection Agency 2002). The lack of available exposure-response studies precludes the development of a threshold that would be presumed safe for acute exposure to DPM. Consequently, DPM acute health hazards were not evaluated in this HRA. Rather, potential chronic health threats from DPM, which occur only from exposures via inhalation and the resulting effects on the respiratory system, were evaluated in this document (OEHHA and ARB 2013).

The potential for chronic non-cancer hazards is evaluated by comparing the long-term exposure level (DPM concentration) calculated by air pollutant dispersion modeling to a chronic REL. A chronic REL is an established concentration at or below which no adverse health effects are anticipated to occur under continuous exposure for up to a lifetime.

Chronic non-cancer hazard quotients (HQ) are calculated by dividing the exposure period's average concentration (as estimated using air dispersion modeling) by the REL for that substance. When the HQ exceeds 1.0, there is increased concern that exposed individuals may experience respiratory system irritation or injury, particularly among sensitive individuals.

Cancer risk assessment involves estimating exposure to carcinogenic chemicals and multiplying the dose times the cancer potency factor. As agreed per consultation with the air districts in the Study Area and described in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, a significant cancer risk is defined as a risk that exceeds 10 in one million.

DPM presents a cancer risk to the respiratory system (OEHHA and ARB 2012). Consequently, the HRA used a four-step approach to evaluating inhalation cancer risks for BDCP construction activities. The first step–hazard identification–involved identifying the pollutants of most concern. For the HRA, these pollutants were identified as DPM and PM2.5 (Huss and Dubose pers. comm.; Jones pers. comm. A; Martien pers. comm.; Martien and Lau pers. comm.; Villalvazo, Siong, and Barber pers. comm.).

The second step–exposure assessment–involved estimating the degree of public exposure to DPM and PM2.5 associated with construction of the BDCP water conveyance features. This step involved using an air quality dispersion model to estimate DPM and PM2.5 concentrations at sensitive receptors–residences, educational facilities, medical facilities, parks near each alternative. The air modeling used emission estimates associated with each alternative's construction activities and hourly meteorological data to estimate the construction-related pollutant concentrations. Additional details of the particulate matter dispersion modeling are included in Section 22.3.1.4 (below) and in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.*

The third step–dose-response evaluation–involved estimating chronic non-cancer health hazards and cancer risks, based on the concentrations estimated for the sensitive receptor locations in the exposure assessment. This step involved comparing the highest estimated concentrations of DPM in each air district to the non-cancer exposure threshold (the chronic REL) and also using those highest concentrations to estimate the cancer risks for people potentially exposed at those locations. Also in this step, the highest estimated concentrations of PM2.5 in each air district were compared to PM2.5 concentration thresholds.

The fourth step–risk characterization–used the results of the dose-response evaluation to characterize the significance of the health threats posed by each alternative's DPM and PM2.5 emissions (and PM10 emissions for Alternative 4; see Section 22.3.1.4).

The four-step approach used to evaluate inhalation health threats is consistent with state and local guidance for HRAs (BAAQMD 2011; OEHHA 2003; 2009; 2012). Moreover, the analysis utilizes conservative exposure-response assumptions to ensure health threats are not understated. Values reported in this document therefore represent a worst-case evaluation of potential health threats associated with construction of the BDCP water conveyance facilities. A full list of assumptions used to quantify TAC emissions can be found in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

22.3.1.4 Particulate Matter Dispersion Modeling (SMAQMD)

The SMAQMD has adopted concentration-based thresholds of significance for PM10 emissions. The air district indicates that projects not meeting applicable screening criteria have the potential to exceed the adopted PM10 thresholds. Because PM2.5 is a subset of PM10, SMAQMD further assumes that projects in excess of the PM10 threshold may result in a significant or adverse PM2.5 impact. It is recommended that lead agencies perform dispersion modeling to estimate PM10 concentrations at offsite receptors resulting from construction projects that do not meet the air district's screening criteria. SMAQMD is the only air district in the Plan Area to have adopted guidance for particulate matter dispersion modeling.

Pursuant to SMAQMD's dispersion modeling guidance (SMAQMD 2013), dispersion modeling of construction-generated PM10 emissions was performed for Alternative 4 using the model AERMOD. SMAQMD's guidance provides recommended inputs for control, source, receptor, meteorology, and output pathways. The exposure assessment involved estimating the degree of public exposure to PM10 associated with construction of the BDCP water conveyance features associated with Alternative 4. This analysis involved using an air quality dispersion model to estimate daily PM10 concentrations at sensitive-receptors locations near Alternative 4. The air modeling used emission estimates associated with the alternative's construction activities and hourly meteorological data to estimate the construction-related PM10 concentrations. The highest PM10 estimated concentrations in the SMAQMD were compared to the applicable PM10 thresholds of 2.5 $\mu g/m^3$ for a 24-hour average and 1 $\mu g/m^3$ for an annual average, both of which are equivalent to 5% of the state CAAQS for PM10. This comparison is made because the PM10 background concentrations in the area currently exceed the CAAQS, thus it is appropriate to evaluate if the contribution of the project to exceedances of the CAAQS is significant.

A full list of assumptions used to quantify PM10 concentrations for Alternative 4 is provided in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.*

22.3.1.5 Programmatic Assessment of the Conservation Measures 2–22

Restoration techniques that require physical changes to the environment or that require use of construction equipment, such as construction and maintenance activities associated with restoration actions to restore, enhance, and manage physical habitat in the defined conservation zones (CZs) and Restoration Opportunity Areas (ROAs),[8] would primarily generate temporary construction emissions through earthmoving activities (e.g., grading), use of mobile and stationary construction equipment, and onroad vehicle movement. The conservation measures that consist of programs to reduce the adverse effects of various stressors on covered species (CM12–CM22) are anticipated to generate the same emissions, relative to Existing Conditions and the No Action

[8] The Plan Area is subdivided into 11 CZs within which conservation targets for natural communities and covered species' habitats have been established. ROAs encompass those locations in the Plan Area considered most appropriate for the restoration of tidal habitats and within which restoration goals for tidal and associated upland natural communities will be achieved. See Section 3.3.2, *Conservation Measures*, for additional detail.

Alternative. Therefore, only the air quality and GHG impacts of CM2–CM11 are analyzed (programmatically) for the proposed BDCP.

Pollutant emissions are highly dependent on the total amount of distributed area; the type, location, and duration of construction; and the intensity of construction activity. Thus, construction effects would vary depending on the habitat restoration and enhancement conservation actions implemented under the BDCP.

Long-term air quality and GHG effects are associated with changes in the permanent, continued daily use of the study area. Operational emissions from the implementation of CM2–CM11 would primarily result from vehicle trips for site inspections, monitoring, and routine maintenance. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants (see below).

Information on the location and types of construction equipment required for each conservation measure is unavailable. Likewise, the levels of potential long-term operation and maintenance activities that may result from implementation of these measures are currently unknown. Consequently, a quantified analysis of potential criteria pollutant and GHG emissions is not possible, so a qualitative assessment of air quality effects resulting from the proposed program was performed. The qualitative analysis took into account typical construction and operation and maintenance activities that would be undertaken for implementation of the habitat restoration and enhancement efforts in CM2–CM11, as described in Chapter 3, *Description of Alternatives,* Section 3.6.2.

Land Use Analysis

BDCP includes acreage targets for restoring tidal and riparian habitat, grassland, nontidal marsh, and seasonal wetland in the study area. Estimating potential changes in GHG emissions from habitat creation involves a considerable amount of uncertainty. In particular, key variables, including carbon cycling, methane production, and nitrogen cycling vary by land use type, season, and site-specific chemical and biological characteristics. Depending on these conditions, land use change associated with the BDCP may result in a net increase or decrease in GHG emissions. To fully characterize project impacts, additional information is required that is currently unknown. For example, acreage by land use type, site-specific land characteristics (e.g., salinity, pH, age of trees, type of grass, carbon content of soils), and fuel consumption data would be required to estimate the net difference in emissions between the removal and addition of GHGs into the atmosphere (i.e., GHG flux). Without local sampling and monitoring data, these values are unknown. Consequently, a quantified analysis of potential GHG emissions from land use change is not possible; a qualitative assessment of GHG flux resulting from the proposed program was therefore performed.

22.3.2 Determination of Effects

Potential air quality and GHG impacts were assessed in relation to relevant thresholds of significance established by agencies with jurisdictional authority, and/or applicable laws and regulations, including Appendix G of the State CEQA Guidelines. An effect was considered to be adverse (under NEPA) and significant (under CEQA) if it would result in any of the following conditions.

- Conflict with or obstruct implementation of the applicable air quality plan. For the purposes of this analysis, "conflict with or obstruct implementation" is defined as circumstances in which total direct and indirect emissions in excess of General Conformity *de minimis* thresholds (Table 22-8) do not conform to the appropriate air basin SIPs. As discussed in Section 22.2.1.1, conformance is demonstrated by satisfying any of the following requirements.
  - Showing that the emission increases caused by the federal action are included in the SIP.
  - Demonstrating that the State agrees to revise the SIP to include the emission increases.
  - Offsetting the action's emissions in the same or nearby area to net zero within the same time frame as they are generated.
  - Mitigating to reduce the emission increase to net zero.
  - Utilizing a combination of the above options.
- Violate any air quality standard or substantially contribute to an existing or projected air quality violation. For the purposes of this analysis, "violate any air quality standard or substantially contribute to an existing or project air quality violation" is defined as circumstances in which construction or operational emissions exceed the applicable air district thresholds identified in Table 22-9.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). For the purposes of this analysis, a "cumulatively considerable net increase" is defined as circumstances in which total direct emissions exceed the applicable air district thresholds identified in Table 22-9. As discussed further in Section 22.3.3.17, the emissions thresholds presented in Table 22-9 represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. Therefore, exceedances of the project-level thresholds, as identified in Table 22-9, would be cumulatively considerable.
- Expose sensitive receptors to substantial pollutant concentrations. For the purpose of this analysis, schools, day care facilities, medical facilities, parks, and residences are considered sensitive receptor locations. A "substantial pollutant concentration" is defined as levels in excess of the applicable air district thresholds identified in Table 22-9.
- Create objectionable odors affecting a substantial number of people. For the purpose of this analysis, construction of an odor-producing facility, as defined by the study area air quality management districts, would result in an "objectionable odor" capable of affecting a substantial number of people. Odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities.

As noted above, BDCP compatibility with applicable plans and policies is described throughout the impact headers (refer to Impacts AQ-1 through AQ-9). Exceedances of established air quality thresholds could indicate an incompatibility with an applicable plan, policy, or regulation adopted to avoid or mitigate effects. Note that as discussed in Chapter 13, *Land Use,* Section 13.2.3, state and federal agencies are not generally subject to local land use regulations; incompatibilities with plans and policies are not, by themselves, physical consequences to the environment.

22.3.2.1 Federal Thresholds

Criteria Pollutants

The air quality study area is in federally classified nonattainment and/or maintenance areas for ozone, CO, PM10, and PM2.5 (Table 22-4). Consequently, to fulfill general conformity requirements, a General Conformity evaluation must be undertaken to identify whether the total ozone, CO, PM10, and PM2.5 emissions for the alternatives are subject to the General Conformity rule. The General Conformity evaluation must consider both direct and indirect sources of emissions for all nonattainment and/or maintenance pollutants, which include regulated precursor emissions. Regulated precursor emissions for ozone include ROG and NO_X. Regulated precursor emissions for PM2.5 include SO_2, NO_X, and ROG (see Table 22-4). Therefore, the General Conformity analysis evaluates each of these direct and indirect (precursor) emissions.

The General Conformity evaluation is made by comparing all emission sources (e.g., haul trucks, off-road equipment) to the applicable General Conformity *de minimis* thresholds. It should be noted that because power plants are subject to New Source Review permitting requirements, which are exempt from the General Conformity rule, emissions associated with electricity generation are not included in the General Conformity evaluation. Because the attainment status of the four area air basins differ with respect to ozone, CO, PM10, PM2.5, and SO_2, different *de minimis* thresholds must be applied to emissions generated within each air basin. Table 22-8 summarizes the *de minimis* thresholds applicable to each air basin.

Table 22-8. Federal d*e minimis* Thresholds by Air Basin (tons per year)

Pollutant	SFNA	SJVAB	SFBAAB
NO_X	25	10	100
VOC/ROG	25	10	100
CO	100	100	100
PM10	100	100	–
PM2.5	100	100	100
SO_2	100	100	100

Toxic Air Contaminants

Thresholds for evaluating adverse effects related to TAC exposure have not been adopted by EPA. Therefore, the thresholds for evaluating TACs in the analysis was based on the context and intensity of the exposure of sensitive receptors to TACs and PM2.5 concentrations, consistent with guidance from the local air districts,. The "substantial" TACs threshold defined by the air districts is the probability of contracting cancer for the maximum exposed individual (MEI) exceeding 10 in 1 million, or the ground-level concentrations of non-carcinogenic TACs resulting in a hazard index (HI) greater than 1 for the MEI (see Table 22-9 in Section 22.3.2.2). These thresholds were used in this analysis to determine the context and intensity of this effect.

The BAAQMD and SJVAPCD have adopted incremental PM2.5 significance thresholds that are more protective than the NAAQS for PM2.5. Therefore, these district-specific significance thresholds would apply. The "substantial" PM2.5 thresholds are defined by the BAAQMD as annual exhaust PM2.5 concentrations exceeding 0.3 micrograms per cubic meter ($\mu g/m^3$). The substantial PM2.5 thresholds are defined by the SJVAPCD as annual total PM2.5 concentrations exceeding 0.6 $\mu g/m^3$

and 24-hour total PM2.5 concentrations exceeding 2.5 μg/m^3 (see Table 22-9). The PM10 dispersion modeling analysis performed for SMAQMD was used as a surrogate for PM2.5, per SMAQMD's CEQA guidelines (see Section 22.3.1.4). The YSAQMD has not adopted significance threshold for PM2.5.

22.3.2.2 Local Air District Thresholds

Criteria Pollutants

The alternatives fall under the jurisdiction of four air districts—YSAQMD, SMAQMD, BAAQMD, and SJVAPCD—each of which has different emission thresholds, as shown in Table 22-9. Therefore, construction and operational emissions in each air district were quantified and analyzed separately, as previously indicated.

Toxic Air Contaminants

Health threats from exposure of sensitive receptors to substantial levels of DPM were evaluated against the appropriate air district thresholds shown in Table 22-9.

22.3.2.3 Greenhouse Gas Thresholds

DWR Climate Action Plan/Greenhouse Gas Emissions Reduction Plan

In May 2012, DWR adopted the DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (CAP), which details DWR's efforts to reduce GHG emissions consistent with EO S-3-05 and AB-32 (Appendix 22D, *DWR Climate Action Plan*). The CAP provides estimates of historical (going back to 1990), current, and future GHG emissions related to operations (e.g., energy use), construction (e.g., bulldozer), maintenance (e.g., flood protection facility upkeep), and business practices (e.g., DWR building related). The CAP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures that DWR will undertake to achieve these goals.

DWR prepared its CAP consistent with CEQA Guidelines section 15183.5. This section of the CEQA Guidelines provides that a "Plan for the Reduction of Greenhouse Gas Emissions," which meets the specified requirements, "may be used in the cumulative impacts analysis of later projects." More specifically, "[l]ater project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines section 15183.5.) Because global climate change, by its very nature, is a global cumulative impact[9], an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." (See CEQA Guidelines, § 15064[h][3].)

[9] Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors, which are primarily pollutants of regional and local concern. Given their long atmospheric lifetimes (see Table 22-1), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative.

1 **Table 22-9. Thresholds of Significance**

Analysis	YSAQMD	SMAQMD	BAAQMD[a]	SJVAPCD
Criteria Pollutants (Construction)[b]	ROG: 10 tons/year NO_X: 10 tons/year PM10: 80 lbs/day CO: Violation of a CAAQS	NO_X: 85 lbs/day PM10: Exceedance of CAAQS or contribute to an existing violation (5% of CAAQS is significant) or failure to implement emissions control practices[c] CO: Violation of a CAAQS	ROG: 54 lbs/day NO_X: 54 lbs/day PM10: 82 lbs/day (exhaust only) PM2.5: 54 lbs/day (exhaust only) Fugitive Dust: Failure to implement BMPs	ROG: 10 tons/year NO_X: 10 tons/year PM10: 15 tons/year PM2.5: 15 tons/year CO: Violation of a CAAQS Fugitive Dust: Failure to implement BMPs
Criteria Pollutants (Operations)	Same as construction thresholds	ROG: 65 lbs/day NO_X: 65 lbs/day PM10: Same as construction CO: Same as construction	ROG: Same as construction NO_X: Same as construction PM10: 82 lbs/day PM2.5: 54 lbs/day CO: Violation of a CAAQS	Same as construction thresholds
DPM	Increased cancer risk of 10 in 1 million or increased non-cancer hazard of greater than 1.0 (HI)[b]	Increased cancer risk of 10 in 1 million or increased non-cancer hazard of greater than 1.0 (HI)[b]	Increased cancer risk of 10 in 1 million (100 in 1 million, cumulative); increased non-cancer hazard of greater than 1.0 (HI) (10, cumulative); Exhaust PM2.5 increase of greater than 0.3 μg/m^3 (0.8 μg/m^3, cumulative)[d]	Increased cancer risk of 10 in 1 million or increased non-cancer hazard of greater than 1.0 (HI); Total PM2.5 increase (exhaust plus fugitive emissions) of greater than 0.6 μg/m^3 annual average or greater than 2.5 μg/m^3 24-hour average.

Sources: Yolo-Solano Air Quality Management District 2007; Sacramento Metropolitan Air Quality Management District 2011; Bay Area Air Quality Management District 2011; San Joaquin Valley Air Pollution Control District 2002; San Joaquin Valley Air Pollution Control District 2009; Siong pers. comm. 2011; Villalvazo pers. comm.

[a] The BAAQMD's mass emissions significance thresholds are based on Regulation 2, Rule 2, which requires new stationary sources offset criteria pollutants above specific emissions limits. These limits are established to ensure new sources would not impede attainment of the NAAQS, and correspond to the significance thresholds shown in Table 22-9. Although Regulation 2, Rule 2 applies to new stationary sources, development projects result in criteria pollutants for which the SFBAAB is designated nonattainment (see Table 22-4). Therefore, the emissions limits can be applied to construction and operational phases of development projects—projects that result in emissions below these thresholds would not contribute to an existing or expected air quality violation, and would, therefore, be deemed no not result in a significant impact. Similar to the criteria pollutant thresholds, the BAAQMD Regulation 2, Rule 5 establishes cancer risk and non-cancer hazard limits for new and modified sources. Although emissions of construction-related DPM would be temporary, and current health threat modeling methodologies are associated with longer-term exposure periods, DPM is a known TAC associated with diesel-powered equipment. To ensure a project does not expose sensitive receptors to increased threat, the emissions limits identified in Regulation 2, Rule 5 can be applied to construction. A similar rationale can be applied to the PM2.5 emissions limits identified in Table 22-9, which are based on the EPA's Significant Impact Level (SIL) for San Francisco.

[b] Neither the YSAQMD nor SMAQMD have established CEQA thresholds for PM2.5. The YSAQMD uses a PM10 mass emission threshold that is considered to be surrogate for PM2.5 (PM2.5 represents a subset of PM10). The SMAQMD has developed a CEQA threshold that includes PM10 concentration thresholds or failure to implement emission control practices. These two thresholds are also considered to be surrogates for a PM2.5 threshold.

[c] Per the SMAQMD's CEQA guidelines, a "project is considered significant if emissions exceed a CAAQS or contribute substantially to an existing or projected violation of a CAAQS. A substantial contribution is considered an emission that is equal to or greater than 5% of a CAAQS." Since PM10 background concentrations in the Plan Area currently exceed the CAAQS, it is necessary to evaluate if the project will contribute to existing violations of the CAAQS (i.e., 5% of CAAQS is considered significant).

[d] Note that a quantitative cumulative analysis was not conducted due to the rural nature of the project area (additional major sources are not anticipated in the vicinity of the project area). However, cumulative health threats are considered in relation to ongoing and reasonably foreseeable future projects in the air basin. Please refer to Section 22.3.3.17.

2

Chapter 12 of DWR's CAP outlines how individual projects can demonstrate consistency with the CAP so that they may rely on the analysis it provides for the purposes of a CEQA cumulative GHG impacts analysis. The CAP requires that the following steps be taken to ensure that the project is consistent with the CAP:

- Identify, quantify, and analyze the GHG emissions from the proposed project and alternatives.
- If construction emissions levels are greater than 25,000 MT CO_2e for the entire construction phase of the project or they exceed 12,500 MT CO_2e in any single year of construction, the project's construction emission cannot rely on the analysis provide in the DWR CAP and must complete a project specific analysis of the construction emissions for CEQA purposes.
- Emissions Reduction Measures CO-1 and CO-2 must be incorporated into the design of the project.
    - CO-1 Construction BMPs designed to minimize fuel consumption by construction and transportation of materials, reduce landfill material usage, and reduce emissions from cement production. DWR's recommended BMPs are listed in Appendix 3B.
    - CO-2 Compliance with CARB's 2007 Off-Road Diesel Vehicle Regulation designed to phase in the use of cleaner engines in diesel vehicles with engines greater than 25 horsepower and any other statewide regulations targeting GHG emissions reductions.
- Determine that the project does not conflict with DWR's ability to implement any of the specific action GHG emissions reduction measures outlined in the CAP.
    - OP-1 Termination of Power Supplies from Reid Gardner Power Plant
    - OP-2 Energy Efficiency Improvements
    - OP-3 Renewable Energy Procurement Plan
    - OP-5 High-Efficiency Energy Resources
    - BP-1 Participate in SMUD Commercial Greenergy Program
    - BP-2 Participate in SMUD Carbon Offset Program
    - BP-3 Implement the DWR Sustainability Policy

In addition to all of the above listed requirements, if implementation of the proposed project would result in additional energy demands on the SWP system of 15 GWh per year or greater the project must perform additional analyses with the DWR SWP Power and Risk Office to determine of the additional energy demand will require DWR to take additional steps beyond those identified in the CAP to achieve its emissions reduction goals. If the analyses indicate that the additional load resulting from the proposed project would require DWR to modify existing or implement additional GHG emissions reduction measures, such measures must be approved by DWR SWP Power and Risk Office.

The BDCP GHG emissions analysis presented in this chapter meets the consistency requirements detailed in the DWR CAP.

Operational Emissions Approach and Threshold

Consistent with DWR project-level cumulative GHG emission analysis requirements, operational emissions associated with increased SWP pumping and project maintenance are consistent with the

"Guidance for Quantifying Greenhouse Gas Emissions and Determining the Significance of their Contribution to Global Climate Change for CEQA Purposes" and a GHG Emission Reduction Plan Consistency Determination Form from DWR's CAP was completed. BDCP will result in additional SWP energy demands in excess of 15 GWh/year (see Appendix 22A, *Air Quality Analysis Assumptions,* for expected increase in energy demand). Consultation with the DWR SWP Power and Risk Office has occurred to verify whether DWR's Renewable Power Procurement Plan would accommodate the additional energy demand associated with BDCP. Modifications to the Renewable Power Procurement Plan for alternatives that would require additional renewable energy resources to maintain DWR's emissions reduction trajectory have been identified to ensure covered BDCP activities do not conflict with DWR's ability to achieve the GHG reductions outlined in the CAP. As such, operational emissions from 1) increased SWP pumping and 2) project maintenance are addressed consistent with DWR's CAP and are found to be less than significant.

Construction Emissions Approach and Threshold

Consistent with DWR project-level cumulative GHG emission analysis requirements, construction emissions of the BDCP project were calculated consistent with the "Guidance for Quantifying Greenhouse Gas Emissions and Determining the Significance of their Contribution to Global Climate Change for CEQA Purposes" and a GHG Emission Reduction Plan Consistency Determination Form from DWR's CAP was completed and submitted to DWR. Project-level GHG reduction measures (CO-1 and CO-2) included in the CAP have also been incorporated into the project design as environmental commitments (see Appendix 3B, *Environmental Commitments*).

As indicated in the impact analysis below (Section 22.3.3), BDCP construction emissions are in excess of 25,000 MT CO_2e for each project alternative (except for the No Action Alternative). As such, the significance determination for construction-related emissions cannot be determined by relying on the analysis in DWR's CAP.

Neither the CEQA nor NEPA lead agencies have established quantitative significance thresholds for GHG emissions; instead each project put forth by the lead agencies is evaluated on a case by case basis using the most up to date calculation and analysis methods. However, by enacting the Global Warming Solutions Act of 2005 (AB 32), the State Legislature has established statewide GHG reduction targets. Further, the Legislature has determined that GHG emissions, as they relate to global climate change, are a source of adverse environmental impacts in California and should be addressed under CEQA. AB 32 did not amend CEQA, although the legislation identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501(a)). SB 97, in contrast, added explicit requirements that CEQA analysis address the impacts of GHG emissions (PRC Sections 21083.05 and 21097).

Scientific studies (as best represented by the IPCC's periodic reports) demonstrate that climate change is already occurring due to past GHG emissions. Evidence concludes that global emissions must be reduced below current levels to avoid the most severe climate change impacts. Given the seriousness of climate change and the regional significance of BDCP, the DWR has determined that for the purposes of this analysis, any substantial increase in construction-related GHG emissions above net zero (0) would result in a significant impact. A net zero threshold represents a conservative assessment of construction emissions considering that any GHGs released during construction will be temporary and cease once construction is complete. Regardless, DWR selected a net zero threshold out of an abundance of caution to avoid underrepresenting potential impacts.

In accordance with scientific consensus regarding the cumulative nature of GHGs, the analysis provides a cumulative evaluation of GHG emissions. Unlike traditional cumulative impact assessments, this analysis is still project-specific in that it only evaluates direct emissions generated by BDCP; given the global nature of climate change, the analysis does not include emissions from past, present, and reasonably foreseeable projects in the study area. Consequently, effects associated with GHG emissions analyzed in this evaluation are cumulative in nature.

CVP Operational Emissions Approach and Threshold

New water conveyance facilities associated with BDCP would be constructed, owned, and operated as a component of the SWP. Water pumped at the new facilities would be primarily for SWP and CVP customers. Hydropower is the primary energy source for CVP activities. Increased CVP pumping associated with BDCP will therefore not directly result in increased GHG emissions (hydro is considered neutral with respect to emissions). However, hydropower supplied to BDCP would reduce the quantity of hydropower supplied to the California grid and/or other CVP customers. BDCP may therefore result in an indirect emissions effect as energy from alternative sources (e.g., natural gas, solar) would be required to meet this demand. Increased GHG emissions generated by CVP pumping could impede attainment of statewide renewable and GHG reduction goals, as outlined in AB 32. Accordingly, an adverse effect would occur if indirect GHG emissions would conflict with AB 32 and state RPS goals.

22.3.3 Effects and Mitigation Approaches

22.3.3.1 No Action Alternative

The No Action Alternative is the future condition that would occur if none of the action alternatives were implemented. The No Action Alternative includes projects and programs with defined management and/or operational plans, including facilities under construction as of February 13, 2009, because those actions would be consistent with the continuation of existing management direction or level of management for plans, policies, and operations by the NEPA lead agencies and other agencies. The No Action Alternative assumptions also include projects and programs that received approvals and permits in 2009 to remain consistent with existing management direction. A more comprehensive list of projects and programs are listed in Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions*.

Facilities under construction as of February 13, 2009 would result in short-term criteria pollutant and GHG emissions from land disturbance and the use of heavy-duty equipment. Pollutant emissions are highly dependent on the total amount of disturbed area, the duration of construction, and the intensity of construction activity. In addition, the number and types of heavy-duty equipment significantly affect emissions generated by vehicle exhaust. Construction impacts can thus vary depending on the type of construction project implemented under the No Action Alternative. Construction emissions associated with the No Action Alternative would result in an adverse effect if the incremental difference, or increase, relative to Existing Conditions exceeds applicable air district or federal de minimis thresholds.

As described in Chapter 3, *Description of Alternatives*, many of the ongoing programs include development of future projects that would require additional project-level environmental review. Future federal actions would be required to comply with NEPA and other federal laws and regulations. Mitigation and permit requirements would be implemented on a case-by-case basis, Activities associated with long-term maintenance of the existing SWP and CVP systems (e.g., inspection trips) would continue, but there would be no changes attributable to the BDCP that would affect long-term operational emissions. Annual electric consumption for pumping under Existing Conditions and the No Action Alternative were calculated in Chapter 21, *Energy* (see Section 21.3.3, Table 21-9). Criteria pollutant and GHG emissions generated by electricity consumption and distribution are presented in Table 22-10.

Table 22-10. Total Criteria Pollutant and GHG Emissions from Electricity Consumption during Operation of the No Action Alternative (tons/year)[a,b,c]

Condition	ROG	CO	NO_X	PM10	PM2.5[d]	SO_2	CO_2e[e]
Existing (2010)	9	86	1,481	99	99	2,723	1,787,647
No Action Alternative (2060)	7	66	1,138	76	76	2,092	1,373,676

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).
[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level.
[c] Power plants located throughout the state supply the grid with power, which will be distributed to the study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with the No Action Alternative electricity demand cannot be ascribed to a specific air basin or air district within the study area.
[d] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.
[e] Emissions presented in metric tons of CO_2e.

As discussed in Chapter 21, *Energy*, Section 21.3.3.1, there would be no substantial changes in CVP and SWP energy production or use for the No Action Alternative because there would be no change in the operations of the existing CVP and SWP hydroelectric generation facilities or pumping facilities. Because emissions rates are expected to decrease in the future due to state mandates for renewable energy production, implementation of the No Action Alternative would result in a decrease in criteria pollutants and GHG emissions.

BDCP conservation measures, such as restoration of wildlife habitat in Suisun Marsh, would not take place, although restoration actions could be undertaken as part of other actions. For example, approximately 8,000 acres of sensitive habitat in the Delta and vicinity would be restored as part of the conditions of biological opinions on other state and federal actions, and these restoration actions could result in temporary air quality effects similar to the effects of the restoration components of the action alternatives. However, there would be no substantial changes in criteria pollutants or GHG emissions under the No Action Alternative and therefore no adverse air quality effects above and beyond those already occurring due to operation of the SWP and CVP. Most of the existing programs and projects comprising the No Action Alternative would not require substantial operation and maintenance activities or the use of mechanical equipment in the same area as the proposed facilities.

Because power plants are located throughout the state, criteria pollutant emissions associated with electricity demand under the No Action Alternative cannot be ascribed to a specific air basin or air district within the study area and it cannot be determined whether the air pollutant emissions associated with electricity generation would degrade air quality in a specific air basin or air district within the study area. Consequently, impacts relating to the electricity consumption under the No Action Alternative through a comparison of electricity-related emissions to the general conformity *de minimis* thresholds indicated in Table 22-8 or the local thresholds shown in Table 22-9, which are established to manage emissions sources under the jurisdiction of individual air districts, would be inappropriate. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-10, are therefore provided for informational purposes only and are not included in the impact conclusion. Consequently, the No Action Alternative would not result in an adverse effect to air quality.

Climate Change and Catastrophic Seismic Risks

The Delta and vicinity are within a highly active seismic area, with a generally high potential for major future earthquake events along nearby and/or regional faults, and with the probability for such events increasing over time. Based on the location, extent and non-engineered nature of many existing levee structures in the Delta area, the potential for significant damage to, or failure of, these structures during a major local seismic event is generally moderate to high. (See Appendix 3E, *Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies* for more detailed discussion). To reclaim land or rebuild levees after a catastrophic event due to climate change or a seismic event would introduce considerable heavy equipment and associated vehicles, including dozers, excavators, pumps, water trucks, and haul trucks, which would generate emissions and create adverse air quality effects.

***CEQA Conclusion*:** Construction of ongoing projects, programs, and plans under the no project would generate short-term emissions that could temporary affect regional and local air quality. These projects would be required to comply with air district rules and regulations to reduce construction-related criteria pollutant and GHG emissions. Mitigation and permit requirements would be implemented on a case-by-case basis. Energy required for long-term operation of the no project will be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the study area to meet demand. Because these power plants are located throughout the state, criteria pollutant emissions associated with the no project electricity demand cannot be ascribed to a specific air basin or air district within the study area. However, as shown in Table 22-10, operation of the no project would result in a net decrease in all criteria air pollutants and GHG emissions, relative to Existing Conditions. Consequently, a regional air quality benefit would be realized under the no project. This impact would be less than significant. No mitigation is required.

22.3.3.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)

A total of five intakes would be constructed under Alternative 1A. For the purposes of this analysis, it was assumed that Intakes 1–5 would be constructed. Alternative 1A includes construction of an intermediate forebay, and the water conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-3 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 1A would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 1A electricity demand cannot be ascribed to a specific air basin or air district within the study area. Comparing emissions to thresholds shown in Table 22-9, which are established to manage emissions sources under the jurisdiction of individual air districts, would therefore be inappropriate. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-11, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-11. Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 1A (tons/year)[a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	4	0	0	8
2017	-	0	0	7	0	0	12
2018	-	0	1	11	1	1	21
2019	-	0	3	43	3	3	80
2020	-	0	4	62	4	4	114
2021	-	0	4	72	5	5	133
2022	-	0	3	45	3	3	83
2023	-	0	1	16	1	1	29
2024	-	0	1	16	1	1	29
2025	CEQA	2	16	281	19	19	516
2060	NEPA	2	20	348	23	23	640
2060	CEQA	1	8	146	10	10	268

NEPA = Compares criteria pollutant emissions after implementation of Alternative 1A to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 1A to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-12 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

Table 22-12. Criteria Pollutant Emissions from Construction of Alternative 1A (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	2	14	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	26	195	110	5	2	7	1	2	3	1	2	18	10	0	0	0	0	0	0	0
2018	18	132	86	5	1	7	1	1	2	1	2	17	11	0	0	0	0	0	0	0
2019	103	674	443	6	5	11	1	5	6	3	11	73	49	0	1	1	0	1	1	0
2020	71	434	316	6	3	10	1	3	4	2	8	47	35	0	0	1	0	0	0	0
2021	17	85	71	5	1	6	1	1	1	0	3	15	13	0	0	0	0	0	0	0
2022	15	72	65	5	0	6	1	0	1	0	0	2	2	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	90	421	470	7	2	9	1	2	3	2	2	8	10	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	42	320	165	0	3	3	0	3	3	2	4	29	15	0	0	0	0	0	0	0
2017	191	1,373	754	34	9	43	5	9	14	4	10	75	43	2	1	3	0	1	1	0
2018	219	1,519	909	35	10	44	5	10	15	4	19	141	83	2	1	3	0	1	1	0
2019	174	1,208	786	34	7	41	5	7	12	4	18	120	79	2	1	3	0	1	1	0
2020	102	654	512	33	4	37	5	4	9	2	11	75	57	2	0	3	0	0	0	0
2021	61	318	294	33	2	35	5	2	7	1	5	26	25	2	0	2	0	0	0	0
2022	79	395	384	33	2	36	5	2	7	1	6	32	30	2	0	2	0	0	0	0
2023	51	277	280	5	2	7	4	2	5	1	1	4	4	2	0	2	0	0	0	0
2024	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	28	208	101	0	1	1	0	1	1	0	1	6	3	0	0	0	0	0	0	0
2017	26	187	98	22	1	23	3	1	4	0	1	11	6	2	0	2	0	0	0	0
2018	53	382	246	22	2	25	3	2	6	2	3	21	14	2	0	2	0	0	0	0
2019	55	336	263	23	3	25	3	3	6	2	5	31	25	2	0	2	0	0	1	0
2020	51	287	251	23	3	25	3	3	6	2	8	46	41	2	0	2	0	0	1	0
2021	40	208	203	22	2	24	3	2	6	2	7	37	36	2	0	2	0	0	1	0
2022	36	190	199	22	2	24	3	2	5	2	5	26	26	2	0	2	0	0	1	0
2023	22	124	112	3	1	4	3	1	4	0	3	18	17	2	0	2	0	0	0	0
2024	21	115	111	3	1	4	3	1	4	0	1	4	3	2	0	2	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 1A would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-13 summarizes criteria pollutant emissions associated with operation of Alternative 1A in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-13. Criteria Pollutant Emissions from Operation of Alternative 1A (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.45	3.98	3.59	0.14	0.13	0.04	0.00	0.01	0.00	0.00	0.00	0.00
2060	0.42	3.85	3.16	0.13	0.12	0.04	0.00	0.01	0.00	0.00	0.00	0.00
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.84	7.74	6.26	0.27	0.25	0.07	0.02	0.20	0.23	0.01	0.01	0.00
2060	0.82	7.57	5.78	0.27	0.25	0.07	0.02	0.20	0.21	0.01	0.01	0.00
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.43	3.94	3.26	0.14	0.13	0.04	0.01	0.06	0.04	0.00	0.00	0.00
2060	0.41	3.82	2.97	0.14	0.12	0.04	0.01	0.06	0.04	0.00	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 1A would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions of the proposed water conveyance facility would be generated in the YSAQMD. Consequently, construction of Alternative 1A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** No construction emissions generated by the alternative would occur in YSAQMD and would, therefore, not exceed YSAQMD's threshold. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day. While groundbreaking will occur throughout the project site, areas with the largest construction footprints, including all intake and intake pumping plants and the intermediate forebay, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5) would exceed the district's threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; the use of compressed natural gas (CNG), tier 4 engines, and diesel particulate filters (DPFs); and BMPs including proper engine maintenance and idling restrictions (see Appendix 3B, *Environmental Commitments*). These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-12, NO_X emissions would still exceed the air district threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold for PM10 (and, therefore, PM2.5) at offsite receptors.

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[10] Accordingly, this would be an adverse effect.

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[10] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5)emissions to a less-than-significant level; therefore, the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants[11]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SMAQMD through the creation of offsetting reductions of emissions occurring within the SFNA. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SMAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control district or air quality management CEQA thresholds[12] shall be reduced to quantities below the numeric thresholds (see Table 22-9).[13]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SMAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SMAQMD. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SMAQMD's HDLEVIP. The HDLEVIP is designed to reduce NO_X, PM, and ROG from on- and offroad sources.

SMAQMD's incentive programs are a means of funding projects and programs capable of achieving emissions reductions. The payment fee is based on the average cost to achieve one ton per day (tpd) of reductions based on the average cost for reductions over the previous year. Onroad reductions averaged (nominally) $44 million ($NO_X$ only) and off-road reductions averaged $36 million ($NO_X$ only) over the previous year, thus working out to approximately $40

[11] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[12] According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon make determinations regarding the significance of an impact.

[13] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SVAB and the SMAQMD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

million per one tpd of reductions. This rate roughly correlates to the average cost effectiveness of the Carl Moyer Incentive Program.

If DWR is successful in reaching what it regards as a satisfactory agreement with SMAQMD, DWR will enter into mitigation contracts with SMAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SMAQMD and/or within another air district within the SFNA. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-8).
- For emissions not in excess of *de minimis* thresholds but above the appropriate SMAQMD standards: **below the appropriate CEQA threshold levels**. (see Table 22-9)

Implementation of this mitigation would require DWR to adopt the following specific responsibilities.

- Consult with the SMAQMD in good faith with the intention of entering into a mitigation contract with SMAQMD for the HDLEVIP. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two years prior to the required mitigation; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SMAQMD should seek clarification and agreement on SMAQMD responsibilities, including the following.
    - Identification of appropriate offsite mitigation fees required for BDCP.
    - Timing required for obtaining necessary offsite emission credits.
    - Processing of mitigation fees paid by DWR.
    - Verification of emissions inventories submitted by DWR.
    - Verification that offsite fees are applied to appropriate mitigation programs within the SFNA.
- Quantify mitigation fees required to satisfy the appropriate reductions. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SFNA. The schedule in which payments are provided to SMAQMD also influences overall cost. For example, a higher rate on a per-tonnage basis will be required for project elements that need accelerated equipment turn-over to achieve near-term reductions, whereas project elements that are established to contract to achieve far-term reductions will likely pay a lower rate on a per-tonnage basis.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SMAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SMAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through

additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD.

- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SMAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SMAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SMAQMD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above SMAQMD CEQA thresholds are met.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SMAQMD as contemplated by Mitigation Measure AQ-2a, or should DWR enter into an agreement with SMAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-2a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-2a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality violations. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-2a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFNA) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SMAQMD, other air districts within the SFNA, and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.

- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

DWR will develop pollutant-specific formulas to achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrendered all required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD, the ARB, any relevant air pollution control district within the SFNA, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees or other moneys will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-2b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SMAQMD, the ARB, any relevant air pollution control district within the SFNA, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SMAQMD CEQA thresholds for other pollutants.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019, 2020, and 2024
- NO_X: 2017 through 2022 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants[14]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD through the creation of offsetting reductions of emissions occurring within the SFBAAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the BAAQMD involving

[14] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control district or air quality management CEQA thresholds[15] shall be reduced to quantities below the numeric thresholds (see Table 22-9).

DWR will undertake in good faith an effort to enter into a development mitigation contract with BAAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD. The preferred source of emissions reductions for NO_X, ROG, and PM shall be through contributions to BAAQMD's Carl Moyer Program and/or other BAAQMD incentive programs (e.g., TFCA).

If DWR is successful in reaching what it regards as a satisfactory agreement with BAAQMD, DWR will enter into mitigation contracts with BAAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SFBAAB. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-8).
- For emissions not in excess of *de minimis* thresholds but above the appropriate BAAQMD standards: **below the appropriate CEQA threshold levels**. (see Table 22-9)

Implementation of this mitigation would require DWR adopt the following specific responsibilities.

- Consult with the BAAQMD in good faith with the intention of entering into a mitigation contract with BAAQMD for the Carl Moyer Program and/or other BAAQMD emission reduction incentive program. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. In negotiating the terms of the mitigation contract, DWR and BAAQMD should seek clarification and agreement on BAAQMD responsibilities, including the following.
  - Identification of appropriate offsite mitigation fees required for BDCP.
  - Timing required for obtaining necessary offsite emission credits.
  - Processing of mitigation fees paid by DWR.
  - Verification of emissions inventories submitted by DWR.
  - Verification that offsite fees are applied to appropriate mitigation programs within the SFBAAB.
- Quantify mitigation fees required to satisfy the appropriate reductions. Funding for the emission reduction projects will be provided in an amount up to the emission reduction

[15] According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon make determinations regarding the significance of an impact.

project cost-effectiveness limit set by for the Carl Moyer Program during the year that the emissions from construction are emitted. (The current emissions limit is $17,460 / weighted ton of criteria pollutants [NO_X + ROG + (20*PM)]). An administrative fee of 5% would be paid by DWR to the BAAQMD to implement the program. The funding would be used to fund projects eligible for funding under the Carl Moyer Program guidelines or other BAAQMD emission reduction incentive program meeting the same cost-effectiveness threshold that are real, surplus, quantifiable, and enforceable.

- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to BAAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to BAAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), BAAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, the DWR will coordinate with BAAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above BAAQMD CEQA thresholds are met.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with BAAQMD as contemplated by Mitigation Measure AQ-3a, or should DWR enter into an agreement with BAAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-3a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-3a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality violations. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-3a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFBAAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with BAAQMD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

DWR will develop pollutant-specific formulas to achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrendered all required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees or other moneys will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-3b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with BAAQMD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed SJVAPCD's annual NO_X threshold for all years between 2017 and 2023, even with implementation of environmental commitments (Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General

Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants[16]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD through the creation of offsetting reductions of emissions occurring within the SJVAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SJVAPCD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control district or air quality management CEQA thresholds[17] shall be reduced to quantities below the numeric thresholds (see Table 22-9).[18]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SJVAPCD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SJVAPCD's VERA. The VERA is implemented through the District Incentive Programs and is a measure to reduce project impacts under CEQA. The current VERA payment fee for construction emissions is $9,350 per ton of NO_X and $9,011 per ton of PM10. Payment fees vary by year (i.e., future year payment fees for NO_X could be in excess of the current price of $9,350) and are sensitive to the number of projects requiring emission reductions within the same air basin (Siong pers. comm. 2012).

If DWR is successful in reaching what it regards as a satisfactory agreement with SJVAPCD, DWR will enter into mitigation contracts with SJVAPCD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions must occur within the SJVAB. required levels are:

- For emissions in excess of the federal de minimis threshold: **net zero (0)**.
- For emissions not in excess of *de minimis* thresholds but above the SJVAPCD's standards: **below the appropriate CEQA threshold levels**.

Implementation of this measure would require DWR to adopt the following specific responsibilities.

- Consult with the SJVAPCD in good faith with the intention of entering into a mitigation contract with SJVAPCD for the VERA. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented

[16] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[17] According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon make determinations regarding the significance of an impact.

[18] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SJVAB and the SJVAPCD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two months (2) prior to groundbreaking; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SJVAPCD should seek clarification and agreement on SJVAPCD responsibilities, including the following.

  - Identification of appropriate offsite mitigation fees required for BDCP.
  - Processing of mitigation fees paid by DWR.
  - Verification of emissions inventories submitted by DWR
  - Verification that offsite fees are applied to appropriate mitigation programs within the SJVAB.

- Quantify mitigation fees required to satisfy the appropriate reductions. An administrative fee of 4% would be paid DWR to the SJVAPCD to implement the program. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SJVAB.

- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SJVAPCD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SJVAPCD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD.

- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SJVAPCD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SJVAPCD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above SJVAPCD CEQA thresholds are met.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity

De Minimis Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SJVAPCD as contemplated by Mitigation Measure AQ-4a, or should DWR enter into an agreement with SJVAPCD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-4a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-4a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality violations. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-4a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SJVAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SJVAPCD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

DWR will develop pollutant-specific formulas to achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to pay all required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees or other moneys will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-4b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SJVAPCD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 1A would not involve the construction of any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 1A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's thresholds would not be exceeded (see Table 22-9). This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-13, operation and maintenance activities under Alternative 1A would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-13, operation and maintenance activities under Alternative 1A would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SJVPACD are expected at construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. As shown in Table 22-13, operation and maintenance activities under Alternative 1A would not exceed SJVAPCD's thresholds of significance (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction and operation of Alternative 1A in the SFNA, SJVAB, and SFBAAB are presented in Table 22-14. Violations of the federal *de minimis* thresholds are shown in underlined text.

Sacramento Federal Nonattainment Area

As shown in Table 22-14, implementation of Alternative 1A would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2016 and 2022. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and 2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and 2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Table 22-14. Criteria Pollutant Emissions from Construction and Operation of Alternative 1A in the SFNA, SJVAB, and SFBAAB (tons/year)

Year	Sacramento Federal Nonattainment Area					
	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	4	29	15	0	0	0
2017	10	75	43	3	1	0
2018	19	141	83	3	1	0
2019	18	120	79	3	1	0
2020	11	75	57	3	0	0
2021	5	26	25	2	0	0
2022	6	32	30	2	0	0
2023	1	4	4	2	0	0
2024	0	0	0	0	0	0
2025	0.02	0.20	0.23	0.01	0.01	0.00
2060	0.02	0.20	0.21	0.01	0.01	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	1	6	3	0	0	0
2017	1	11	6	2	0	0
2018	3	21	14	2	0	0
2019	5	31	25	2	1	0
2020	8	46	41	2	1	0
2021	7	37	36	2	1	0
2022	5	26	26	2	1	0
2023	3	18	17	2	0	0
2024	1	4	3	2	0	0
2025	0.01	0.06	0.04	0.00	0.00	0.00
2060	0.01	0.06	0.04	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*
	San Francisco Bay Area Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	2	18	10	0	0	0
2018	2	17	11	0	0	0
2019	11	73	49	1	1	0
2020	8	47	35	1	0	0
2021	3	15	13	0	0	0
2022	0	2	2	0	0	0
2023	0	0	0	0	0	0
2024	2	8	10	0	0	0
2025	0.00	0.01	0.00	0.00	0.00	0.00
2060	0.00	0.01	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

San Joaquin Valley Air Basin

As shown in Table 22-14, implementation of Alternative 1A would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-14, implementation of the Alternative 1A would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, AQ-2b, AQ-4a, and AQ-4b would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*), this impact would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer hazard and cancer risk.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-15, construction of Alternative 1A would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). For context, smoking causes 636 excess lung cancer deaths per million men (390 excess deaths per million women), and countless more non-death related cancer cases (American Lung Association 2012). Cancer risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors within YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* Alternative 1A would not exceed YSAQMD's non-cancer or cancer health thresholds (Table 22-15) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1A construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health threats. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-15. Alternative 1A Health Threats in the Yolo-Solano Air Quality Management District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.00021	0.6 per million
YSAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-16, these emissions would result in an increase of DPM emissions in the Plan Area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Alternative 1A would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-16) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1A construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health threats. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-16. Alternative 1A Health Threats in the Sacramento Metropolitan Air Quality Management District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.00051	1.5 per million
SMAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-17, these emissions would increase DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1A would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-17) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching. Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1A construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health threats. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Table 22-17. Alternative 1A Health Threats in the San Joaquin Valley Air Pollution Control District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Total (µg/m³)	PM2.5 24-hour Total (µg/m³)
Maximum Value	0.00019	0.56 per million	0.022	1.6
SJVAPCD Thresholds	*1*	*10 per million*	*0.6*	*2.5*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
Note: Total PM2.5 thresholds includes PM2.5 exhaust emissions and fugitive dust-generated emissions.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-18, these emissions would result in an increase of DPM emissions in the study area, particularly near sites involving the greatest duration and intensity of construction activities.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1A would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-18) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1A construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Table 22-18. Alternative 1A Health Threats in the Bay Area Air Quality Management District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Exhaust (μg/m³)
Maximum Value	0.00078	2.3 per million	0.0039
BAAQMD Thresholds	*1*	*10 per million*	*0.3*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: The generation and severity of odors is dependent on a number of factors, including the nature, frequency, and intensity of the source; wind direction; and the location of the receptor(s). Odors rarely cause physical harm, but can cause discomfort, leading to complaints to regulatory agencies. Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 1A would not result in the addition of a major odor producing facility.

Diesel emissions from construction equipment may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that the operation or the construction of the project would create objectionable odors. The effect of exposure to odors during construction would not be adverse.

***CEQA Conclusion*:** Alternative 1A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 1A are summarized in Table 22-19. Emissions are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-20 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-19). GHG emissions presented in Table 22-20 are therefore provided for information purposes only.

1 **Table 22-19. GHG Emissions from Construction of Alternative 1A (metric tons/year)[a]**

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[b]	Total CO_2e
Emissions with Environmental Commitments				
2016	5,776	6,199	98,857	110,833
2017	19,002	9,722	98,857	127,581
2018	36,285	17,117	98,857	152,259
2019	51,078	66,746	98,857	216,680
2020	43,494	98,323	98,857	240,675
2021	24,712	114,170	98,857	237,740
2022	19,637	71,622	98,857	190,116
2023	6,584	24,581	98,857	130,022
2024	4,739	24,581	98,857	128,177
Total	*211,308*	*433,061*	*889,713*	*1,534,083*
Emissions with Environmental Commitments and State Mandates				
2016	5,561	5,274	98,857	109,692
2017	17,982	8,060	98,857	124,899
2018	33,725	13,820	98,857	146,403
2019	46,588	52,441	98,857	197,886
2020	38,680	75,118	98,857	212,655
2021	21,948	87,225	98,857	208,030
2022	17,472	54,719	98,857	171,048
2023	5,870	18,779	98,857	123,506
2024	4,227	18,779	98,857	121,863
Total	*192,054*	*334,214*	*889,713*	*1,415,982*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-21).

Values may not total correctly due to rounding.

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3 **Table 22-20. GHG Emissions from Construction of Alternative 1A by Air District (metric tons/year)**

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	44,094	177,943	222,037
SMAQMD	112,690	533,828	646,518
SJVACD	54,524	177,943	232,467
Emissions with Environmental Commitments and State Mandates			
BAAQMD	40,101	177,943	218,044
SMAQMD	102,976	533,828	636,804
SJVACD	48,978	177,943	226,920

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-21).

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Construction of Alternative 1A would generate a total of 1.4 million metric tons of GHG emissions[19] after implementation of environmental commitments and state mandates (see Appendix 3B, *Environmental Commitments*). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion**:** Construction of Alternative 1A would generate a total of 1.4 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

BDCP proponents will develop a GHG Mitigation Program prior to the commencement of any construction or other physical activities associated with CM1 that would generate GHG emissions. The GHG Mitigation Program will consist of feasible options that, taken together, will reduce construction-related GHG emissions to net zero (0) (i.e., emissions will be reduced to the maximum extent feasible and any remaining emissions from the project will be offset elsewhere by emissions reductions of equal amount). The BDCP proponents will determine the nature and form of the components of the GHG Mitigation Program after consultation with the following agencies, as applicable: (i) Study area air districts (BAAQMD, SMAQMD, SJVPACD, and YSAQMD), (ii) California Air Resources Board, (iii) U.S. Environmental Protection Agency, and (iv) California Energy Commission.

Specific strategies that could be used in formulating the GHG Mitigation Program are summarized below. The identified strategies will produce GHG reductions across a broad range of emissions sectors throughout the state. The strategies are divided into seven categories based on their application. Potential GHG emissions reductions that could be achieved by each measure are identified. It is theoretically possible that many of the strategies discussed below could independently achieve a net-zero GHG footprint for BDCP construction activities. Various combinations of measure strategies could also be pursued to optimize total costs or community co-benefits. The BDCP proponents shall be responsible for determining the overall mix of strategies necessary to ensure the performance standard to mitigate the adverse GHG construction impacts is met.

BDCP proponents will develop a mechanism for quantifying, funding, implementing, and verifying emissions reductions associated with the selected strategies. BDCP proponents will also conduct annual reporting to verify and document that selected strategies achieve sufficient emissions reductions to offset construction-related emissions to net zero. All selected strategies must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e.,

[19] This is equivalent to adding approximately 283,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b).

the reductions would not happen without the financial support of purchased offset credits or other mitigation strategies). Annual reports will include, at a minimum the following components.

- Calculated or measured emissions from construction activities over the reporting year.
- Projects selected for funding during the reporting year.
- Total funds distributed to selected projects during the reporting year.
- Cumulative funds distributed since program inception.
- Emissions reductions achieved during the reporting year.
- Cumulative reductions since program inception.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-15.

GHG Emissions Reduction Strategies to Consider in Formulating a GHG Mitigation Program

This section summarizes GHG reduction strategies that will be considered in formulating a GHG mitigation program. Quantitative information on the potential capacity of each strategy is provided. These estimates are based on general construction activity information, the size and trading volume of existing carbon offset markets, and available alternative energy resources (e.g., biomass, renewable energy) available to the project as potential mitigation strategies. Emissions reductions quantified for each strategy should be seen as high-level screening values that illustrate a rough order of magnitude for the expected level of emissions reductions or offsets. Moreover, the mitigation strategies should be viewed not as individual strategies, but rather as a suite of strategies. If one strategy, when investigated in greater detail prior to implementation, cannot deliver as high a level of emissions reduction or offset as initially estimated, other strategies will be implemented to ensure achievement of the performance standard of zero net GHG emissions from the project.

Renewable Energy Purchase Agreement

- **Strategy-1: Renewable Energy Purchase Agreement:** Enter into a power purchase agreement, where feasible, with utilities which provide electricity service within the Study area to purchase construction electricity from renewable sources. Renewable sources must be zero emissions energy sources (e.g., wind, solar, hydro) and may not be accounted to utility RPS goals. Sufficient renewable resources already exist within the state (currently 30,005 gigawatt-hours per year) to offset 100% of emissions generated by construction electricity for all BDCP alternatives (1,428 gigawatt-hours over a nine-year construction period) and additional renewable energy resources are expected to be brought online prior to commencement of construction activities.

Additional Onsite Mitigation

- **Strategy-2: Engine Electrification**: DWR has identified all feasible electrification requirements as environmental commitments. It is anticipated that additional technology will be available by the time construction starts that will enable further electrification. This strategy would take advantage of new technologies as they become available and will engage the maximum level of engine electrification feasible for onsite heavy-duty equipment. Depending on the number of equipment pieces electrified, maximum emissions reductions achieved by this strategy for Alternative 1A over the nine-year construction period are estimated at approximately 72,000 MT CO_2e[20].

- **Strategy-3: Low Carbon Concrete**: Require concrete components to be constructed out of concrete with up to 70% replacement of cement with supplementary cementitious materials (SCM) with lower embodied energy and associated GHG emissions.[21] Implementation of this strategy would require structural testing to ensure the concrete meet required strategy strength, durability, workability, and rigidity standards. If new materials with lower embodied energy or superior workability are developed between the writing of this measure and project commencement, the BDCP proponents will investigate use of those materials in place of SCM. Depending on the volume of concrete replaced, maximum emissions reductions achieved by this strategy for Alternative 1A over a nine-year construction period are estimated at approximately 258,000 MT CO_2e.
- **Strategy-4: Renewable Diesel and/or Bio-diesel:** Require use of renewable diesel sometimes also called "green diesel" and or bio-diesel fuels for operation of all diesel equipment. If new technologies or fuels with lower emissions rates are developed between the writing of this measure and project commencement, those advanced technologies or fuels could be incorporated into this measure. Depending on the number of equipment pieces retrofitted, maximum emissions reductions achieved by this strategy for Alternative 1A over the nine-year construction period are estimated at approximately 28,000 MT CO_2e.

Energy Efficiency Retrofits and Rooftop Renewable Energy

- **Strategy-5: Residential Energy Efficiency Improvements**: Develop a residential energy retrofit package in conjunction with local utility providers to achieve reductions in natural gas and electricity usage. The retrofit package should include, at a minimum, the following improvements.
  - Replacement of interior high use incandescent lamps with compact florescent lamps (CFLs) or Light Emitting Diodes (LED).
  - Installation of programmable thermostats.
  - Replacement of windows with double-pane or triple-pane solar-control low-E argon gas filled wood frame windows.
  - Identification and sealing of dust and air leaks.
  - Replacement of electric clothes dryers with natural gas dryers.
  - Replacement of natural gas furnaces with Energy Star labeled models.
  - Installation of insulation.

[20] Value assumes equipment categories currently identified for electrification through environmental commitments (see Appendix 22A, *Air Quality Analysis Assumptions*) will be maximized so that all equipment pieces in those categories will be electric.

[21] SCM are often incorporated in concrete mix to reduce cement contents, improve workability, increase strength, and enhance durability. Although SCM can improve the strength of resulting structures, proper testing is required ensure the cement meets technical specifications for strength and rigidity.

This measure is inherently scalable (i.e., the total number of houses retrofit is likely limited by funds rather than the availability of housing stock). There are 1.4 million homes (2008 est.) within the socioeconomic Study area (i.e., Delta Study area). The potential capacity for residential retrofits is therefore around 700,000 retrofits (assuming half the homes are already retrofitted or cannot be retrofitted). Assuming the above retrofit achieves a 1,486 MT CO_2e reduction per package per year (U.S. Department of Energy 2012), there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

- **Strategy-6: Commercial Energy Efficiency Improvements**: Develop a commercial energy retrocommissioning package in conjunction with local utility providers to improve building-wide energy efficiency by at least 15%, relative to current energy consumption levels. This measure is inherently scalable. Assuming each retrofit achieves a 15% reduction in building energy use, there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

- **Strategy-7: Residential Rooftop Solar**: Develop a residential rooftop solar installation program in conjunction with local utility providers. The installation program will allow homeowners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable. Based on the average annual electricity generation of a residential solar system in the Central Valley, there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

- **Strategy-8: Commercial Rooftop Solar**: Develop a commercial rooftop solar installation program in conjunction with local utility providers. The installation program will allow business owners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable. Based on the average annual electricity generation of a commercial solar system in the Central Valley, there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

Carbon Offsets

- **Strategy-9: Purchase Carbon Offsets**: In partnership with offset providers, purchase carbon offsets. Offset protocols and validation could tier off existing standards (e.g., Climate Registry Programs) or could be developed independently, provided such protocols satisfy basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). ARB has established a Cap and Trade registry that identifies qualified providers and AB 32 projects. It is estimated that between 2012 and 2020, 2.5 billion allowances will be made available within the state (Legislative Analyst's Office 2012). The national and international carbon markets are likely greater. Potential offset programs could include the following.
    - AB 32 U.S. Forest and Urban Forest Project Resources
    - AB 32 Livestock Projects
    - AB 32 Ozone Depleting Substances Projects

- AB 32 Urban Forest Projects
- Other-California Based Offsets
- United States Based Offsets
- International Offsets (e.g., clean development mechanisms)

This measure is inherently scalable based on the volume of offsets purchased and could potentially offset 100% of emissions from construction activities.

Biomass Digestion and Conversion

- **Strategy-10: Development of Biomass Waste Digestion and Conversion Facilities**: Provide financing for facility development either through long term power purchase agreements or up front project financing. Projects will be awarded based on competitive bidding process and chosen for GHG sequestration and other environmental benefits to project area. Projects will provide a range of final products: electricity generation, Compressed Natural Gas for transportation fuels, and pipeline quality biomethane. Based on the number and size of dairies and biomass resources within the Study area, there are sufficient resources to offset 100% of construction emissions for all BDCP alternatives.
- **Strategy-11: Agriculture Waste Conversion Development:** Fund the re-commissioning of thermal chemical conversion facilities to process collected agricultural biomass residues**.** Project funding will include better resource modeling and provide incentives to farmers in the project area to deliver agricultural wastes to existing facilities. There are sufficient biomass resources within the Study area (13.6 million bone dry tons/year) to offset 100% of emissions generated by construction of all BDCP alternatives.

Increase Renewable Energy Purchases to Operate the State Water Project

- **Strategy-12: Temporarily Increase Renewable Energy Purchases for Operations**: Temporarily increase renewable energy purchases under the Renewable Energy Procurement Plan to offset BDCP construction emissions. DWR as part of its CAP is implementing a Renewable Energy Procurement Plan. This plan identifies the quantity of additional renewable electricity resources that DWR will purchase in each year between 2010 and 2050 to achieve the GHG emissions reduction goals laid out in the CAP. During the expected BDCP construction period for Alternative 1A (2016–2022), DWR estimates that it would need to purchase 250 to 490[22] additional gigawatt-hours (GWh) of renewable electricity for each of the nine years of construction, or for years following construction (3,500 GWh total) to offset the entire quantity of GHG emissions emitted by construction of Alternative 1A. This strategy would purchase renewable electricity in excess of the quantity needed to meet DWR's GHG emissions reduction goals. The additional renewable electricity purchases would offset emissions from construction activities. Maximum emissions

[22] The State Water Project uses a portfolio of electricity resources to meet its electricity needs for water pumping including hydropower generation at its facilities, contracts for power from other generators, and market purchases from the California Independent System Operator (CAISO) grid. Additional renewable energy purchases under Strategy 12 would result in reduced purchases from the CAISO grid. DWR uses the California Air Resources Board emissions factor (437 metric tons CO_2e/GWh) for unspecified power purchases to calculate emissions from CAISO grid market purchases.

reductions achieved by this strategy over the nine-year construction period could potentially offset 100% of emissions from construction activities.

Land Use Change and Sequestration

- **Strategy-13: Tidal Wetland Inundation**: Expand the number of subsidence reversal and/or carbon sequestration projects currently being undertaken by DWR on Sherman and Twitchell Islands. Existing research at the Twitchell Wetlands Research Facility demonstrates that wetland restoration can sequester 25 tons of carbon per acre per year. Measure funding could be used to finance permanent wetlands for waterfowl or rice cultivation, creating co-benefits for wildlife and local farmers. Given the variability associated with land use change and GHG flux, maximum emissions reductions associated with this strategy are currently unknown.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 1A would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-21).

Table 22-21 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-21 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-21. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 1A (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e}		Concrete Absorption (CO_2)[a]	Total CO_2e	
		NEPA Point of Comparison	CEQA Baseline		NEPA Point of Comparison	CEQA Baseline
Emissions without State Targets						
2025 Conditions	268	-	443,657	0	-	443,925
2060 Conditions	268	549,795	230,168	-37,368	512,695	193,068
Emissions with State Targets						
2025 Conditions	228	-	338,949	0	-	339,177
2060 Conditions	226	420,037	175,846	-37,368	382,895	138,703

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 1A to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-22 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-22 are therefore provided for information purposes only.

Table 22-22. Total CO_2e Emissions from Operation and Maintenance of Alternative 1A by Air District (metric tons/year)[a]

Year	Emissions without State Mandates	Emissions with State Mandates
2025 Conditions		
SMAQMD	209	173
SJVAPCD	53	50
BAAQMD	6	5
2060 Conditions		
SMAQMD	209	171
SJVAPCD	53	50
BAAQMD	6	5

[a] Emissions do not include emissions generated by increased electricity usage.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 1A would add approximately 1,727 GWh[23] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,727 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 1A including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-3 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 1A. As shown in Figure 22-3, in 2024, the year BDCP Alternative 1A is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.7 million metric tons of CO_2e. This elevated level is approximately 400,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2045 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 1A is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 1A would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's Renewable Energy Procurement Plan (REPP). The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-23 below shows how the REPP could be modified to accommodate BDCP Alternative 1A, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026

[23] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

DWR's energy portfolio would contain nearly 1,700 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is nearly twice the amount called for in the original DWR REPP (1,692 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, over 13,000 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-4 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 1A.

Table 22-23. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 1A)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	297
2026–2030	72	72
2031–2040	108	58
2041–2050	144	69
Total Cumulative	52,236	65,461

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 1A would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 1A would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 1A is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 1A would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 1A with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under

DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 1A, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 1A, however, would result in an increase of 166 GWh in the demand for CVP generated electricity, which would result in a reduction of 166 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (166 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 166 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 50,198 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 38,296 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 1A would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 1A would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Implementation of the Conservation Measures 2–11 could generate additional traffic on roads and highways in and around Suisun Marsh and the Yolo Bypass related to restoration or monitoring activities. Habitat restoration and enhancement activities that require physical changes or heavy-duty equipment would generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. Habitat restoration and enhancement conservation measures are anticipated to include a number of activities generating traffic to transport material and workers to and from the construction sites, including the following.

- Grading, excavating, and placing fill material.
- Breaching, modifying, or removing existing levees and constructing new levees.
- Modifying, demolishing, and removing existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).
- Constructing new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).

Operational emissions associated with Conservation Measures 2–11 would primarily result from vehicle trips for site inspections, monitoring, and routine maintenance. The intensity and frequency of vehicle trips associated with routine maintenance are assumed to be relatively minor. Because the specific areas and process for implementing CM2–CM11 has not been determined, this effect is evaluated qualitatively.

Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. Activities with the greatest potential to have short or long-term air quality effects are denoted with an asterisk (*).

CM2–CM11 restoration activities would occur in all air districts. Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1A could potentially exceed applicable general conformity *de minimis* levels listed in Table 22-8 and applicable local thresholds listed in Table 22-9. The effect would vary according to the equipment used in construction of a specific conservation measure, the location and timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1A would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

BDCP proponents will develop an Air Quality Mitigation Plan (AQMP) prior to the commencement of any construction, operational, or other physical activities associated with CM2–CM11 that would involve adverse effects to air quality. The AQMP will be incorporated into the site-specific environmental review for all conservation measures or project activities. BDCP proponents will ensure that the following measures are implemented to reduce local and regional air quality impacts. Not all measures listed below may be feasible or applicable to each conservation measure. Rather, these measures serve as an overlying mitigation framework to be used for specific conservation measures. The applicability of measures listed below may also vary based on the lead agency, location, timing, available technology, and nature of each conservation measure.

- Implement basic and enhanced dust control measures recommended by local air districts in the project-area. Applicable control measures may include, but are not limited to, watering exposed surfaces, suspended project activities during high winds, and planting vegetation cover in disturbed areas.
- Require construction equipment be kept in proper working condition according to manufacturer's specifications.
- Ensure emissions from all off-road diesel-powered equipment used to construct the project do not exceed applicable air district rules and regulations (e.g., nuisance rules, opacity restrictions).
- Reduce idling time by either shutting equipment off when not in use or limiting the time of idling to less than required by the current statewide idling restriction.
- Reduce criteria pollutant exhaust emissions by requiring the latest emissions control technologies. Applicable control measures may include, but are not limited to, engine retrofits, alternative fuels, electrification, and add-on technologies (e.g., DPF).
- As feasible, require a minimum buffer distance of 1,000 feet from sensitive receptors for diesel equipment.

Implementation of this measure will reduce criteria pollutant emissions generated by construction, operational, or other physical activities associated with CM2–CM11. The applicability of measures listed above may vary based on the lead agency, location, timing, available technology, and nature of each conservation measure. If the above measures do not contribute to emissions reductions, guidelines will be developed to ensure that criteria pollutants generated during construction and project operations are reduced to the maximum extent practicable.

Table 22-24. Summary of Conservation Measures and Potential Criteria Pollutant Emissions

Habitat Restoration Activity	Potential Emissions
Grading, excavating, and placing fill material.	Criteria pollutant and GHG exhaust emissions from grading equipment (e.g., grader, bulldozer) and haul trucks). Fugitive dust from excavation activities.
Breaching, modifying, or removing existing levees and construction of new levees.*	Criteria pollutant and GHG exhaust emissions from marine vessels and onshore construction equipment.
Modifying, demolishing, and removing existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).*	Criteria pollutant and GHG exhaust emissions from construction equipment (e.g., backhoe, bulldozer) required to demolish existing structures. Fugitive dust during demolition. Exhaust emissions from haul trucks required to remove demolished material from the project site. Potential reduction in criteria pollutants if diesel pumps are removed.
Constructing new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure). Removing existing vegetation and planting/seeding of vegetation.*	Criteria pollutant and GHG exhaust emissions from construction equipment (e.g., backhoe, small bulldozer). ROG emissions from paving activities. Fugitive dust emissions from trenching for electric transmission and gas lines. Potential increase or decrease in CO_2 sequestration rates from land use change.
Controlling the establishment of nonnative vegetation to encourage the establishment of target native plant species.	Potential for criteria pollutant and GHG exhaust emissions from equipment used to modify existing habitat or remove nonnative vegetation.
Control of nonnative predator and competitor species (e.g., feral cats, rats, nonnative foxes).	Potential for criteria pollutant and GHG exhaust emissions from equipment used to modify existing habitat (e.g., install berms).
Minor grading, excavating, and filling to maintain infrastructure and habitat functions (e.g., levee maintenance; grading or placement of fill to eliminate fish stranding locations).	Criteria pollutant and GHG exhaust emissions from grading equipment (e.g., grader, bulldozer) and haul trucks. Fugitive dust from excavation activities.
Maintenance of infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure, fences).	Criteria pollutant and GHG exhaust emissions from inspection vehicles. Potential for ROG emissions if architectural coatings are applied to existing buildings or roads are repaved.
Maintaining vegetation and vegetation structure (e.g., grazing, mowing, burning, trimming).	Criteria pollutant and GHG exhaust emissions from mowers, smoke, trimmers, and other vegetation management equipment.
Ongoing control of terrestrial and aquatic nonnative plant and wildlife species.	Potential for criteria pollutant and GHG exhaust emissions from equipment used to modify existing habitat or remove nonnative vegetation.

Note: Activities with the greatest potential to have short or long-term air quality effects are denoted with an asterisk (*).

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 1A would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-25. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Restoration activities associated with Alternative 1A would create the following land types.

- Up to 65,000 acres of tidal wetland habitat
- Up to 5,000 acres of riparian habitat
- Up to 10,000 acres of seasonally inundated floodplain
- Up to 2,000 acres of grassland
- Up to 1,200 acres of nontidal marsh

An initial analysis of land cover/use changes associated with tidal and riparian habitat restoration indicates that these program elements could have a beneficial impact on GHG emissions in the California Delta. However, as discussed above, carbon flux from land use change is dynamic and extremely variable. For example, the carbon sequestration potential of saline marshes ranges from 54 to 385 grams of CO_2 per square meter per year (Trulio 2007). Wetlands also sequester carbon dioxide, but at a much slower rate. While these land uses can sequester CO_2, they also produce CH_4. Since CH_4 is a far more potent GHG, when compared to CO_2, CH_4 production may overwhelm the benefits obtained from carbon sequestration (U.S. Climate Change Science Program 2007).

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 1A could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

BDCP proponents will prepare a land use sequestration analysis to evaluate GHG flux associated with implementation of CM2–CM11. The land use analysis will evaluate the one-time carbon storage loss associated with vegetation removal, soil carbon content, and existing and future with project GHG flux. In the event that the land use analysis demonstrates a net positive GHG flux, feasible strategies to reduce GHG emissions will be undertaken. To the extent feasible, mitigation shall require project design changes so that land uses that serve as carbon sinks (i.e., result in net decreases in carbon) are not replaced with other uses that are sources (i.e., result in net increases in carbon) of GHG emissions.

22.3.3.3 Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)

As with Alternative 1A, a total of five intakes would be constructed (assumed to be Intakes 1–5). Under Alternative 1B, no intermediate forebay would be constructed. The conveyance facility would be a canal on the east side of the Sacramento River (Figures 3-4 and 3-5 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 1B would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 1B electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-25, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-25. Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 1B (tons/year) [a, b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2014	-	0	0	5	0	0	9
2015	-	0	1	9	1	1	17
2016	-	0	1	14	1	1	26
2017	-	0	1	17	1	1	32
2018	-	0	1	14	1	1	26
2019	-	0	1	12	1	1	23
2020	-	0	0	5	0	0	9
2021	-	0	0	3	0	0	6
2022	-	0	0	3	0	0	6
2025	CEQA	2	15	258	17	17	475
2060	NEPA	2	19	326	22	22	599
2060	CEQA	1	7	124	8	8	227

NEPA = Compares criteria pollutant emissions after implementation of Alternative 1B to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 1B to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-26 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

1 **Table 22-26. Criteria Pollutant Emissions from Construction of Alternative 1B (pounds/day and tons/year)**

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	36	269	134	4	2	5	0	2	2	0	4	29	15	0	0	1	0	0	0	0
2016	33	233	125	3	1	4	0	1	2	0	6	40	20	0	0	1	0	0	0	0
2017	28	187	98	1	1	2	0	1	1	0	3	19	10	0	0	0	0	0	0	0
2018	35	246	138	2	1	4	0	1	2	0	5	33	18	0	0	0	0	0	0	0
2019	20	144	85	1	1	3	0	1	1	1	2	16	10	0	0	0	0	0	0	0
2020	11	79	58	0	1	1	0	1	1	1	2	14	10	0	0	0	0	0	0	0
2021	10	71	57	0	1	1	0	1	1	1	0	3	2	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	31	254	110	0	1	2	0	1	1	0	1	8	4	0	0	0	0	0	0	0
2015	103	879	413	34	5	39	4	5	9	1	8	66	31	2	0	2	0	0	1	0
2016	167	1,279	655	38	7	45	5	7	12	2	18	141	71	4	1	4	0	1	1	0
2017	148	1,214	697	37	7	44	4	7	12	2	9	75	40	3	0	3	0	0	1	0
2018	74	613	455	39	4	43	5	4	9	1	5	43	26	2	0	2	0	0	0	0
2019	36	248	168	23	2	25	3	2	5	1	2	13	9	1	0	1	0	0	0	0
2020	1	9	5	11	0	11	2	0	2	0	0	2	1	1	0	1	0	0	0	0
2021	1	7	5	11	0	11	2	0	2	0	0	1	1	1	0	1	0	0	0	0
2022	1	6	5	11	0	11	2	0	2	0	0	1	1	1	0	1	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	94	767	344	4	5	9	0	5	5	2	6	47	21	0	0	1	0	0	0	0
2015	707	5,582	2,650	129	33	163	16	33	49	10	64	497	235	9	3	12	1	3	4	1
2016	638	4,808	2,409	144	28	173	17	28	45	9	83	630	316	14	4	17	2	4	5	1
2017	475	3,450	1,876	105	21	125	13	21	34	7	50	361	198	10	2	12	1	2	3	1
2018	196	1,338	798	74	9	83	10	9	18	4	27	184	111	6	1	7	1	1	2	1
2019	116	755	499	59	5	64	8	5	13	3	15	96	62	4	1	5	1	1	1	0
2020	40	237	179	32	1	33	4	1	6	1	5	28	20	2	0	2	0	0	0	0
2021	18	106	81	25	1	25	4	1	4	0	2	9	7	1	0	1	0	0	0	0
2022	1	4	3	22	0	22	3	0	3	0	0	0	0	1	0	1	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 1B would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-27 summarizes criteria pollutant emissions associated with operation of Alternative 1B in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-27. Criteria Pollutant Emissions from Operation of Alternative 1B (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.45	3.98	3.59	0.14	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.42	3.85	3.16	0.13	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.53	4.79	4.84	0.17	0.16	0.05	0.01	0.05	0.12	0.00	0.00	0.00
2060	0.51	4.65	4.36	0.16	0.15	0.05	0.01	0.05	0.11	0.00	0.00	0.00
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.43	3.94	3.26	0.14	0.13	0.04	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.41	3.82	2.97	0.14	0.12	0.04	0.00	0.01	0.01	0.00	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 1B would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 1B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-26, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2014 and 2019, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the canal, a siphon, and a tunnel segment under the Mokelumne River.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 would exceed the district's threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including all intake and intake pumping plant sites and the canal alignment, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5)would exceed the district's threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-26, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold for PM10 (and, therefore, PM2.5) at offsite receptors.

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[24] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which

[24] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5)emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-26, construction emissions would exceed BAAQMD's daily NO_X threshold for all years between 2015 and 2021, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the BAAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-26, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Plan Area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-26, construction emissions would exceed SJVAPCD's annual thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2015 through 2019
- NO_X: 2014 through 2020
- PM10: 2016

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the SJVAPCD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the east conveyance alignment. PM10 emissions are expected to be greatest within the immediate vicinity of the concrete batching plants. For a map of the proposed east alignment, see Mapbook Figure M3-2.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-26, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Plan Area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 1B would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 1B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River. As shown in Table 22-27, operation and maintenance activities under Alternative 1B would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-27, operation and maintenance activities under Alternative 1B would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SJVPACD are expected at the intermediate pumping plant. For a map of the proposed east alignment, see Mapbook Figure M3-2. As shown in Table 22-27, operation and maintenance activities under Alternative 1B would not exceed SJVAPCD's thresholds of significance (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Plan Area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 1B in the SFNA, SJVAB, and SFBAAB are presented in Table 22-28. Violations of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Table 22-28. Criteria Pollutant Emissions from Construction and Operation of Alternative 1B in the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	1	8	4	0	0	0
2015	8	<u>66</u>	31	2	1	0
2016	18	<u>141</u>	71	4	1	0
2017	9	<u>75</u>	40	3	1	0
2018	5	<u>43</u>	26	2	0	0
2019	2	13	9	1	0	0
2020	0	2	1	1	0	0
2021	0	1	1	1	0	0
2022	0	1	1	1	0	0
2025	0.01	0.05	0.12	0.00	0.00	0.00
2060	0.01	0.05	0.11	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*

	San Joaquin Valley Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	6	<u>47</u>	21	1	0	0
2015	<u>64</u>	<u>497</u>	<u>235</u>	12	4	1
2016	<u>83</u>	<u>630</u>	<u>316</u>	17	5	1
2017	<u>50</u>	<u>361</u>	<u>198</u>	12	3	1
2018	<u>27</u>	<u>184</u>	<u>111</u>	7	2	1
2019	<u>15</u>	<u>96</u>	62	5	1	0
2020	5	<u>28</u>	20	2	0	0
2021	2	9	7	1	0	0
2022	0	0	0	1	0	0
2025	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.00	0.01	0.01	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

	San Francisco Bay Area Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	0	0	0	0	0	0
2015	4	29	15	1	0	0
2016	6	40	20	1	0	0
2017	3	19	10	0	0	0
2018	5	33	18	0	0	0
2019	2	16	10	0	0	0
2020	2	14	10	0	0	0
2021	0	3	2	0	0	0
2022	0	0	0	0	0	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	*-*	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-28 implementation of Alternative 1B would exceed SFNA federal *de minimis* threshold for NO_X for all years between 2015 and 2018. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-28, implementation of Alternative 1B would exceed SJVAB federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2015 through 2019
- NO_X: 2014 through 2020
- CO: 2015 through 2018

ROG and NO_X are precursors to ozone, for which the SJVAB is in nonattainment for the NAAQS. Likewise, the SJVAB is current classified as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SJVAB ozone and CO SIPs for each year of construction for which the *de minimis* thresholds are exceed.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional ROG or NO_X as construction-related ROG and NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or contributions to the SJVAPCD's VERA. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SJVAB federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached at this time. In the event that Alternative 1B is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for CO through a local air quality modeling analysis (i.e., dispersion modeling) to ensure project emissions do not cause or contribute to any new violation of the CO NAAQS or increase the frequency or severity of any existing violation of the CO NAAQS.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-28, implementation of the Alternative 1B would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

CEQA Conclusion**:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional ozone in the SFNA and SJVAB. These measures would therefore ensure total direct and indirect ozone emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Accordingly, a positive conformity determination has been made for emissions within the SMAQMD, SJVAB (ROG and NO_X only), SFBAAB (see Appendix 22E, *Conformity Letters*). This impact would be less than significant with mitigation.

General conformity cannot be satisfied for CO through the purchase of offsets within the SJVAB. Accordingly, this impact would be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threat in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

Although this alternative would not generate DPM emissions within the YSAMD, the emissions generated in adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Plan Area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non- cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* Alternative 1B would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-29) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1B construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Table 22-29. Alternative 1B Health Threats in the Yolo-Solano Air Quality Management District

Alternative 1B	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0003	1.0 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-26, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1B would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-30) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1B construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Table 22-30. Alternative 1B Health Threats in the Sacramento Metropolitan Air Quality Management District

Alternative 1B	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0007	2.0 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-26, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1B would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-31) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-26). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-31, this alternative would generate PM2.5 concentrations that would exceed the SJVAPCD's 24-hour PM2.5 thresholds, and would potentially expose sensitive receptors to substantial pollutant concentrations. DWR has identified several environmental commitments to reduce construction-related emissions, including DPF for heavy-duty construction equipment, which are incorporated in the emissions modeling shown in Table 22-26. DPF are anticipated to reduce DPM by approximately 85%, compared to engines without a DPF (see Appendix 22A, *Air Quality Analysis Assumptions*). While this commitment will substantially reduce DPM and associated health threats, PM2.5 concentrations would still exceed the SJVPACD's 24-hour PM2.5 threshold. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would be adverse. Mitigation Measure AQ-12 is available to reduce this effect.

Table 22-31. Alternative 1B Health Threats in the San Joaquin Valley Air Pollution Control District

Alternative 1B	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Total (μg/m^3)	PM2.5 24-hour Total (μg/m^3)
Maximum Value at MEI	0.0007	2.0 per million	0.13	5.14
Thresholds	1	10 per million	0.6	2.5

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
Note: Total PM2.5 thresholds includes PM2.5 exhaust emissions and fugitive dust-generated emissions.
MEI = maximally exposed individual.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1B construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would exceed the SJVAPCD's thresholds (Table 22-31) and, thus, would expose sensitive receptors to substantial pollutant concentrations and significant health threats. DWR has identified several environmental commitments to reduce construction-related emissions, including DPF for heavy-duty construction equipment, which are incorporated in the emissions modeling shown in Table 22-26. DPF are anticipated to reduce DPM by approximately 85%, compared to engines without a DPF (see Appendix 22A, *Air Quality Analysis Assumptions*). While this commitment will substantially reduce DPM and associated health threats, PM2.5 concentrations would still exceed the SJVPACD's 24-hour PM2.5 threshold.

The primary cause of these PM2.5 exceedances is a proposed concrete batch plant that would be located in San Joaquin County just south of the Consumnes River and west of the canal alignment. This batch plant would cause exceedances at two residences located just north of the plant. The plant would be located within 500 feet of the closest residence and within 700 feet of the second closest residence. Both residences could be exposed to PM2.5 concentrations that exceed the SJVAPCD's 24-hour PM2.5 significance threshold. Mitigation Measure AQ-12 would be available to reduce PM2.5 exposure to a less-than-significant level by reducing PM2.5 concentrations to levels below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-12: Increase Distance between Batch Plant and Sensitive Receptors

To reduce these PM2.5 health threats to a less than significant level, the concrete batch plant should be relocated so that there is a minimum of 1,500 meters between the plant and the closest residence. A revised HRA should be conducted once the engineering designs and location for the batch plant are finalized to confirm the new location will not result in the exposure of sensitive receptors to concentrations of PM2.5 below the SJVAPCD's 24-hour concentration threshold.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-26, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-32) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1B construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's threshold (Table 22-32) and, thus, would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Table 22-32. Alternative 1B Health Threats in the Bay Area Air Quality Management District

Alternative 1B	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Exhaust ($\mu g/m^3$)
Maximum Value at MEI	0.0002	0.65 per million	0.001
Thresholds	1	10 per million	0.3

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 1B would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion**:** Alternative 1B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 1B are presented in Table 22-33. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-33. GHG Emissions from Construction of Alternative 1B (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[b]	Total CO_2e
Emissions with Environmental Commitments				
2014	7,619	6,684	49,544	63,847
2015	89,219	12,495	49,544	151,258
2016	135,329	20,110	49,544	204,983
2017	83,854	25,288	49,544	158,687
2018	51,568	21,346	49,544	122,458
2019	27,612	18,823	49,544	95,980
2020	11,519	7,933	49,544	68,996
2021	3,924	5,337	49,544	58,805
2022	502	5,337	49,544	55,382
Total	*411,145*	*123,354*	*445,899*	*980,397*
Emissions with Environmental Commitments and State Mandates				
2014	7,494	5,977	49,544	63,014
2015	86,760	10,902	49,544	147,206
2016	130,125	17,108	49,544	196,778
2017	79,260	20,966	49,544	149,770
2018	47,936	17,234	49,544	114,714
2019	25,243	14,789	49,544	89,576
2020	10,291	6,061	49,544	65,896
2021	3,497	4,077	49,544	57,119
2022	438	4,077	49,544	54,059
Total	*391,044*	*101,191*	*445,899*	*938,133*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-35).

Values may not total correctly due to rounding.

Table 22-34 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-34). GHG emissions presented in Table 22-34 are therefore provided for information purposes only.

Table 22-34. Total GHG Emissions from Construction of Alternative 1B by Air District (metric tons/year)

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	28,039	0	28,039
SMAQMD	60,183	222,949	283,132
SJVAPCD	322,922	222,949	545,872
Emissions with Environmental Commitments and State Mandates			
BAAQMD	26,423	0	26,423
SMAQMD	57,054	222,949	280,003
SJVAPCD	307,566	222,949	530,516

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-35).

Construction of Alternative 1B would generate a total of 938,133 metric tons of GHG emissions after implementation of environmental commitments and state mandates (see Appendix 3B, *Environmental Commitments*). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 1B would generate a total of 938,133 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 1B would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-35).

Table 22-35 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-35 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-35. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 1B (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e}: NEPA Point of Comparison	Electricity CO_{2e}: CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e: NEPA Point of Comparison	Total CO_2e: CEQA Baseline
Emissions without State Targets						
2025 Conditions	93	-	407,873	0	-	407,966
2060 Conditions	93	514,921	195,294	-18,728	496,286	176,659
Emissions with State Targets						
2025 Conditions	78	-	311,610	0	-	311,688
2060 Conditions	76	393,394	149,202	-18,728	374,742	130,551

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 1B to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-36 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-36 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 1B would add approximately 1,583 GWh[25] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,583 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 1B including any additional energy associated with additional water being moved through the system.

Table 22-36. Total CO_2e Emissions from Operation and Maintenance of Alternative 1B by Air District (metric tons/year)[a]

Year	Emissions without State Mandates	Emissions with State Mandates
2025 Conditions		
SMAQMD	80	65
SJVAPCD	12	12
BAAQMD	1	1
2060 Conditions		
SMAQMD	80	64
SJVAPCD	12	12
BAAQMD	1	1

[a] Emissions do not include emissions generated by increased electricity usage.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-5 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 1B. As shown in Figure 22-5, in 2024, the year BDCP Alternative 1B is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to 1.6 million metric tons of CO_2e. This elevated level is approximately 340,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2043 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 1B is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its

[25] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 1B would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-37 below shows how the REPP could be modified to accommodate BDCP Alternative 1B, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1600 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is nearly twice the amount called for in the original DWR REPP (1,592 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, over 10,000 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-6 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 1B.

Table 22-37. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 1B)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original REPP	New REPP
2011–2020	36	36
2021	72	72
2022–2025	72	272
2026–2030	72	72
2031–2040	108	58
2041–2050	144	74
Total Cumulative	52,236	63,036

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 1B would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 1B would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 1B is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by

2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 1B would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 1B with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 1B, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 1B, however, would result in an increase of 166 GWh in the demand for CVP generated electricity, which would result in a reduction of 166 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential effect impact of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (166 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 166 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 50,198 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 38,296 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 1B would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 1B would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

CEQA Conclusion**:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 1B would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 1B could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.4 Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)

A total of five intakes would be constructed under Alternative 1C. They would be sited on the west bank of the Sacramento River, opposite the locations identified for the pipeline/tunnel and east alignments. Under this alternative, water would be carried south in a canal along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay (Figures 3-6 and 3-7 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 1C would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 1C electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-38, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-38. Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 1C (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2014	-	0	0	5	0	0	9
2015	-	0	0	7	0	0	14
2016	-	0	1	10	1	1	18
2017	-	0	1	25	2	2	46
2018	-	0	2	34	2	2	63
2019	-	0	2	39	3	3	71
2020	-	0	1	23	2	2	42
2021	-	0	0	8	1	1	15
2022	-	0	0	8	1	1	15
2025	CEQA	2	16	284	19	19	521
2060	NEPA	2	20	349	23	23	642
2060	CEQA	1	8	147	10	10	270

NEPA = Compares criteria pollutant emissions after implementation of Alternative 1C to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 1C to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-39 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD in pounds per day and tons per year (no emissions would be generated in the SJVAPCD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

Operation and maintenance activities under Alternative 1C would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-40 summarizes criteria pollutant emissions associated with operation of Alternative 1C in the BAAQMD, SMAQMD, and YSAQMD in pounds per day and tons per year (no emissions would be generated in the SJVAPCD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-39. Criteria Pollutant Emissions from Construction of Alternative 1C (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	15	127	55	0	1	1	0	1	1	0	2	13	6	0	0	0	0	0	0	0
2015	370	2,950	1,514	81	18	98	10	18	28	5	20	153	75	4	1	5	1	1	1	0
2016	348	2,653	1,369	81	15	96	10	15	25	4	34	259	131	6	1	8	1	1	2	0
2017	258	1,893	1,031	61	11	72	8	11	19	4	23	168	94	6	1	7	1	1	2	0
2018	119	847	528	53	5	58	7	5	12	3	15	103	62	4	1	5	1	1	1	0
2019	66	420	293	41	3	44	6	3	8	1	7	44	29	3	0	3	0	0	1	0
2020	30	173	147	34	1	35	5	1	6	0	2	11	8	2	0	2	0	0	0	0
2021	5	30	25	29	0	29	4	0	5	0	0	2	2	2	0	2	0	0	0	0
2022	0	3	2	28	0	28	4	0	4	0	0	0	0	2	0	2	0	0	0	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	16	128	56	0	1	1	0	1	1	0	1	11	5	0	0	0	0	0	0	0
2015	124	1,001	523	17	6	23	2	6	8	2	3	27	14	0	0	0	0	0	0	0
2016	149	1,150	592	23	7	30	3	7	9	2	11	84	43	2	0	2	0	0	1	0
2017	99	745	409	14	4	19	2	4	6	1	8	62	35	2	0	2	0	0	1	0
2018	36	262	171	9	2	11	1	2	3	1	4	27	17	1	0	1	0	0	0	0
2019	19	121	90	5	1	6	1	1	1	0	2	14	10	0	0	1	0	0	0	0
2020	14	80	68	3	0	3	0	0	1	0	1	5	4	0	0	0	0	0	0	0
2021	2	10	9	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
2022	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	78	637	276	4	4	7	0	4	4	1	5	42	18	0	0	0	0	0	0	0
2015	482	3,873	1,920	110	24	133	13	24	37	7	46	362	173	8	2	10	1	2	3	1
2016	471	3,600	1,831	102	22	123	13	22	34	7	60	465	238	10	3	13	1	3	4	1
2017	376	2,874	1,614	86	18	104	11	18	29	6	36	268	149	8	2	10	1	2	3	1
2018	195	1,451	961	84	10	94	11	10	20	4	20	140	85	6	1	7	1	1	2	0
2019	95	633	430	58	4	62	8	4	12	1	8	54	35	4	0	4	0	0	1	0
2020	22	131	103	40	1	40	6	1	7	0	2	13	8	2	0	2	0	0	0	0
2021	9	56	40	13	0	13	2	0	2	0	1	7	5	1	0	1	0	0	0	0
2022	2	14	11	11	0	11	2	0	2	0	0	2	2	1	0	1	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Table 22-40. Criteria Pollutant Emissions from Operation of Alternative 1C (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.13	1.03	2.16	0.04	0.03	0.01	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.11	0.92	1.74	0.03	0.03	0.01	0.00	0.01	0.01	0.00	0.00	0.00
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.12	0.99	2.02	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.11	0.90	1.72	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Thresholds	65	65	-	-	-	-	-	-	-	-	-	-
	Yolo Solano Air Quality Management District						Yolo Solano Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.31	2.66	4.04	0.09	0.08	0.03	0.01	0.05	0.17	0.00	0.00	0.00
2060	0.29	2.51	3.53	0.09	0.08	0.03	0.01	0.05	0.14	0.00	0.00	0.00
Thresholds	-	-	-	*80*	-	-	*10*	*10*	-	-	-	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-39, construction emissions would exceed YSAQMD's thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG (annual): 2015 through 2018
- NO_X (annual): 2014 through 2020
- PM10 (daily): 2015 through 2018

While equipment could operate at any work area identified for this alternative, the highest level of emissions in the YSAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the YSAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-30, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-9. Mitigation Measures AQ-2a and AQ-2b would be available to reduce ROG, NO_X and PM10 through contracts with SMAQMD that result in offsite mitigation within the YSAQMD. Although Mitigation Measures AQ-2a and AQ-2b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce these emissions below district thresholds.[26] Accordingly, this effect would be adverse.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed YSAQMD's thresholds identified in Table 22-9. The YSAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce ROG, NO_X and PM10, given the magnitude of estimated emissions, neither measure would reduce ROG and NO_X emissions below district thresholds. Accordingly, this effect would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-39, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2014 and 2019, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River, as well as the intermediate pumping plant site on Ryer Island.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10

[26] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 would exceed the district's threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including all intake and intake pumping plant sites and the canal footprint, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5)would exceed the district's threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-12, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, neither measure would reduce these emissions below district thresholds. No feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5)emissions.[27] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD's threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, neither measure would reduce these emissions below district thresholds. No feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5)emissions. This impact would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General

[27] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-39, construction emissions would exceed BAAQMD's daily thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2015 through 2019
- NO_X: 2014 through 2020

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and northwest of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-39, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Although Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would not reduce emissions below district thresholds.[28] Accordingly, this effect would be adverse.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would not reduce emissions below district thresholds. Accordingly, this effect would be significant and unavoidable.

[28] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 1C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, construction of Alternative 1C would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed SJVAPCD's thresholds of significance. This impact would be less than significant.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the YSAQMD are expected at intake and intake pumping plant sites along the west bank of the Sacramento River, as well as at the intermediate pumping plant site on Ryer Island. As shown in Table 22-40, operation and maintenance activities under Alternative 1C would not exceed YSAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed YSAQMD thresholds for criteria pollutants. The YSAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate YSAQMD thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SFNA. The impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Based on the data in Table 22-40, operation and maintenance activities under Alternative 1C would not exceed SMAQMD thresholds, and there would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and northwest of Clifton Court Forebay. As shown in Table 22-40, operation and maintenance activities under Alternative 1C would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 1C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 1C would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate SJVAPCD thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SJVAB. This impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 1C in the SFNA and SFBAAB are presented in Table 22-41 (no emissions would be generated in the SJVAB). Violations of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Table 22-41. Criteria Pollutant Emissions from Construction and Operation of Alternative 1C in the SFNA and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	6	<u>53</u>	23	1	0	0
2015	<u>49</u>	<u>390</u>	<u>187</u>	10	3	1
2016	<u>71</u>	<u>549</u>	<u>280</u>	15	5	1
2017	<u>44</u>	<u>330</u>	<u>184</u>	12	3	1
2018	23	<u>167</u>	<u>102</u>	8	2	0
2019	10	<u>68</u>	45	5	1	0
2020	3	18	12	3	0	0
2021	1	7	5	1	0	0
2022	0	2	2	1	0	0
2025	0.01	0.05	0.17	0.00	0.00	0.00
2060	0.01	0.05	0.14	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Francisco Bay Area Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	2	13	6	0	0	0
2015	20	<u>153</u>	75	5	1	0
2016	34	<u>259</u>	<u>131</u>	8	2	0
2017	23	<u>168</u>	94	7	2	0
2018	15	103	62	5	1	0
2019	7	44	29	3	1	0
2020	2	11	8	2	0	0
2021	0	2	2	2	0	0
2022	0	0	0	2	0	0
2025	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.00	0.01	0.01	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-41, implementation of Alternative 1C would exceed SFNA federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2015 through 2017

- NO_X: 2014 through 2019
- CO: 2015 through 2017

NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Likewise, the SFNA is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and CO would conform to the appropriate SFNA ozone and CO SIPs for each year of construction for which the *de minimis* thresholds are exceeded.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SFNA federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. Likewise, although Mitigation Measures AQ-2a and AQ-2b would reduce ROG and NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 1C is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for ROG, NO_X, and CO through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

No emissions would be generated in the SJVAB.

San Francisco Bay Area Air Basin

As shown in Table 22-41, implementation of Alternative 1C would exceed SFBAAB federal *de minimis* thresholds for the following pollutants and years.

- NO_X: 2015 through 2017
- CO: 2016

NO_X is a precursor to ozone, for which the SFBAAB is in nonattainment for the NAAQS. Likewise, the SFBAAB is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for NO_X and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SFBAAB ozone and CO SIPs.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SFBAAB federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. Likewise, although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 1C is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and CO through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

CEQA Conclusion: SFNA and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. General conformity cannot be satisfied for ROG, NO_X, CO through the purchase of offsets within the SFNA, or for NO_X and CO within the SFBAAB. Accordingly, this impact would be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non- cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-39, construction of Alternative 1C would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased cancer threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non- cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* Alternative 1C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-42) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1C construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Table 22-42. Alternative 1C Health Threats in the Yolo-Solano Air Quality Management District

Alternative 1C	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0007	2.12 per million
Thresholds	1	10 per million

Source: Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.
MEI = maximally exposed individual.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-39, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-43) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1C construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Table 22-43. Alternative 1C Health Threats in the Sacramento Metropolitan Air Quality Management District

Alternative 1C	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0012	3.6 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-39, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1C would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-44) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-39). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-42, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1C construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the SJVAPCD's thresholds (Table 22-44) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Table 22-44. Alternative 1C Health Threats in the San Joaquin Valley Air Pollution Control District

Alternative 1C	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Total (μg/m^3)	PM2.5 24-hour Total (μg/m^3)
Maximum Value at MEI	0.000128	0.39 per million	0.003	0.108
Thresholds	1	10 per million	0.6	2.5

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Note: Total PM2.5 thresholds includes PM2.5 exhaust emissions and fugitive dust-generated emissions.

MEI = maximally exposed individual.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-39, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1C would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-45) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 1C construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's threshold (Table 22-45) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Table 22-45. Alternative 1C Health Threats in the Bay Area Air Quality Management District

Alternative 1C	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Exhaust (µg/m^3)
Maximum Value at MEI	0.002	6.13 per million	0.01
Thresholds	1	10 per million	0.3

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 1C would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion**:** Alternative 1C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 1C are presented in Table 22-46. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-47 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD (no emissions would be generated in the SJVAPCD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-46). GHG emissions presented in Table 22-47 are therefore provided for information purposes only.

Construction of Alternative 1C would generate a total of 1.3 million metric tons of GHG emissions, after implementation of environmental commitments and state mandates. This is equivalent to adding 251,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

Table 22-46. GHG Emissions from Construction of Alternative 1C (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[b]	Total CO_2e
Emissions with Environmental Commitments				
2014	72,344	6,563	76,859	86,755
2015	131,640	10,267	76,859	159,471
2016	91,211	13,742	76,859	222,241
2017	54,773	36,773	76,859	204,843
2018	27,022	51,129	76,859	182,762
2019	8,380	59,569	76,859	163,451
2020	3,060	36,373	76,859	121,613
2021	1,053	12,782	76,859	92,702
2022	392,816	12,782	76,859	90,694
Total	*72,344*	*239,981*	*691,735*	*1,324,532*
Emissions with Environmental Commitments and State Mandates				
2014	3,278	5,868	76,859	86,006
2015	70,278	8,958	76,859	156,095
2016	126,478	11,691	76,859	215,028
2017	86,094	30,487	76,859	193,440
2018	50,785	41,280	76,859	168,924
2019	24,612	46,803	76,859	148,274
2020	7,443	27,789	76,859	112,092
2021	2,703	9,765	76,859	89,328
2022	919	9,765	76,859	87,544
Total	*372,590*	*192,405*	*691,735*	*1,256,731*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-48).

Values may not total correctly due to rounding.

Table 22-47. Total GHG Emissions from Construction of Alternative 1C by Air District (metric tons/year)

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	133,736	276,694	410,430
SMAQMD	42,181	0	42,181
YSAQMD	216,899	415,041	631,940
Emissions with Environmental Commitments and State Mandates			
BAAQMD	126,745	276,694	403,439
SMAQMD	39,810	0	39,810
YSAQMD	206,035	415,041	621,076

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-48).

***CEQA Conclusion*:** Construction of Alternative 1C would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 1C would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-48).

Table 22-48 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-48 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-48. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 1C (metric tons/year)

		Electricity CO_{2e}		Concrete	Total CO_2e	
Year	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	Absorption (CO_2)[a]	NEPA Point of Comparison	CEQA Baseline
Emissions without State Targets						
2025 Conditions	99	-	447,902	0	-	448,001
2060 Conditions	99	551,614	231,987	-29,053	522,600	203,033
Emissions with State Targets						
2025 Conditions	79	-	342,192	0	-	342,272
2060 Conditions	77	421,427	177,236	-29,053	392,451	148,260

Note: The NEPA point of comparison compares total CO_2e emissions after implementation of Alternative 1C to the No Action Alternative, whereas the CEQA baseline compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-49 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-49 are therefore provided for information purposes only.

Table 22-49. Total CO_2e Emissions from Operation and Maintenance of Alternative 1C by Air District (metric tons/year)[a]

Year	Emissions without State Mandates	Emissions with State Mandates
2025 Conditions		
SMAQMD	3	2
BAAQMD	7	6
YSAQMD	88	70
2060 Conditions		
SMAQMD	3	2
BAAQMD	7	6
YSAQMD	88	68

[a] Emissions do not include emissions generated by increased electricity usage.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 1C would add approximately 1,675 GWh[29] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,675 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 1C including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-7 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 1C. As shown in Figure 22-7, in 2024, the year BDCP Alternative 1C is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.6 million metric tons of CO_2e. This elevated level is approximately 340,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2044 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 1C is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 1C would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-50 below shows how the REPP could be modified to accommodate BDCP Alternative 1C, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026

[29] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

DWR's energy portfolio would contain nearly 1,700 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is nearly twice the amount called for in the original DWR REPP (1,692 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, over 13,000 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-8 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 1C.

Table 22-50. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 1C)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	297
2026–2030	72	72
2031–2040	108	58
2041–2050	144	69
Total Cumulative	52,236	65,461

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 1C would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 1C would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 1C is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 1C would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 1C with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under

DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 1C, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 1C, however, would result in an increase of 166 GWh in the demand for CVP generated electricity, which would result in a reduction of 166 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential effect impact of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (166 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 166 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 50,198 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 38,296 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 1C would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 1C would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Generation of criteria pollutants under Alternative 1C would be similar to Alternative 1A. Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 1C would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 1C could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.5 Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)

A total of five intakes would be constructed under Alternative 2A. For the purposes of this analysis, it was assumed that Intakes 1–5 or Intakes 1–3 and 6–7 would be constructed under Alternative 2A. Under this alternative, an intermediate forebay would be constructed, and the water conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-3 in Chapter 3, *Description of Alternatives.*

Construction and operation of Alternative 2A would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 2A electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Electricity demand for construction of Alternative 2A would be to equal demand required for Alternative 1A. Electricity emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. Refer to Table 22-20 for a summary of electricity-related criteria pollutants during construction (years 2016 through 2024) of Alternative 1A that are applicable to this alternative. Operational emissions would be different from Alternative 1A and are provided in Table 22-51.

Table 22-51. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 2A (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	1	8	136	9	9	250
2060	NEPA	1	14	243	16	16	447
2060	CEQA	0	2	41	3	3	76

NEPA = Compares criteria pollutant emissions after implementation of Alternative 2A to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 2A to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Alternative 2A would comprise physical/structural components similar to those under Alternative 1A, but would entail an operable barrier along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River). Emissions generated by construction of all features other than the head of Old River barrier under Alternative 1A would be representative of emissions generated by Alternative 2A (refer to Table 22-12).

The head of Old River barrier would be constructed within the SJVAPCD during the last three years of construction (2022 and 2024). To ensure the emissions analysis within the SJVAPCD accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAPCD under Alternative 1A. The resulting emissions are provided in Table 22-52. Violations of the air district thresholds are shown in underlined text.

Table 22-52. Criteria Pollutant Emissions from Construction of Alternative 2A within the SJVAPCD (tons/year)

				PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	1	6	3	0	0	0	0	0	0	0
2017	1	11	6	2	0	2	0	0	0	0
2018	3	21	14	2	0	2	0	0	0	0
2019	5	31	25	2	0	2	0	0	1	0
2020	8	46	41	2	0	2	0	0	1	0
2021	7	37	36	2	0	2	0	0	1	0
2022	5	28	28	2	0	2	0	0	1	0
2023	4	19	18	2	0	2	0	0	0	0
2024	1	4	4	2	0	2	0	0	0	0
Thresholds	10	10	-	-	-	15	-	-	15	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 2A would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 2A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact is would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2A within the SMAQMD was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-12, emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's concentration-based threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. See the discussion of Impact AQ-2 under Alternative 1A.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-12, NO_X and emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[30] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5)emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

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[30] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2A within the BAAQMD was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-12, emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019, 2020, and 2024
- NO_X: 2017 through 2022 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-52, construction emissions would exceed SJVAPCD's annual NO_X threshold for all years between 2017 and 2023, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments* will reduce construction-related emissions; however, as shown in Table 22-52, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 2A would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 2A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

CEQA Conclusion: Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-13, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1A.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-13, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1A.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-13, emissions would not exceed SJVAPCD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 1A.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1A within the SFNA and SFBAAB would be representative of emissions generated by Alternative 2A (refer to Table 22-14). Due to the operable barrier at head of Old River, emissions within the SJVAB would be slightly higher than those quantified for Alternative 1A. To ensure the emissions analysis within the SJVAB accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAB under Alternative 1A. The resulting emissions are provided in Table 22-53. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-53. Criteria Pollutant Emissions from Construction and Operation of Alternative 2A in the SJVAB (tons/year)

Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	1	6	3	0	0	0
2017	1	11	6	2	0	0
2018	3	21	14	2	0	0
2019	5	31	25	2	1	0
2020	8	46	41	2	1	0
2021	7	37	36	2	1	0
2022	5	28	28	2	1	0
2023	4	19	18	2	0	0
2024	1	4	4	2	0	0
2025	0.01	0.06	0.04	0.00	0.00	0.00
2060	0.01	0.06	0.04	0.00	0.00	0.00
De Minimis	10	10	100	100	100	100

Sacramento Federal Nonattainment Area

As shown in Table 22-14, implementation of Alternative 2A would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2016 and 2022. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-53, implementation of Alternative 2A would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-14, implementation of the Alternative 2A would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*: SFNA**, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*), this would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non- cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-12, construction of Alternative 2A would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 2A would be similar to Alternative 1A. As shown in Table 22-15, Alternative 2A would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2A construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-12, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 2A would be similar to Alternative 1A. As shown in Table 22-16, Alternative 2A would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2A construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Tables 22-12 and 22-52, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the GRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 2A would be similar to Alternative 1A. As shown in Table 22-17, Alternative 2A would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Tables 22-12 and 22-52). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2A construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-12, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 2A would be similar to Alternative 1A. As shown in Table 22-18, Alternative 2A would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2A construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 2A would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 2A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG emissions generated by construction of Alternative 2A would be similar to emissions generated for Alternative 1A. However, because Alternative 2A includes an operable barrier at head of Old River, total emissions associated with Alternative 2A would be slightly higher than Alternative 1A. Table 22-54 summarizes GHG emissions associated with Alternative 2A. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions.

Table 22-54. GHG Emissions from Construction of Alternative 2A (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
Emissions with Environmental Commitments				
2016	5,776	6,199	98,857	110,833
2017	19,002	9,722	98,857	127,581
2018	36,285	17,117	98,857	152,259
2019	51,078	66,746	98,857	216,680
2020	43,494	98,323	98,857	240,675
2021	24,712	114,170	98,857	237,740
2022	20,340	71,622	98,857	190,820
2023	7,191	24,581	98,857	130,629
2024	4,832	24,581	98,857	128,270
Total	*212,712*	*433,061*	*889,713*	*1,535,486*
Emissions with Environmental Commitments and State Mitigation				
2016	5,561	5,274	98,857	109,692
2017	17,982	8,060	98,857	124,899
2018	33,725	13,820	98,857	146,403
2019	46,588	52,441	98,857	197,886
2020	38,680	75,118	98,857	212,655
2021	21,948	87,225	98,857	208,030
2022	18,094	54,719	98,857	171,670
2023	6,406	18,779	98,857	124,043
2024	4,306	18,779	98,857	121,943
Total	*193,293*	*334,214*	*889,713*	*1,417,220*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-61).

Values may not total correctly due to rounding.

Table 22-55 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-56 are therefore provided for information purposes only.

Table 22-55. GHG Emissions from Construction of Alternative 2A by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	44,094	177,943	222,037
SMAQMD	112,690	533,828	646,518
SJVACD	55,927	177,943	233,870
Emissions with Environmental Commitments and State Mandates			
BAAQMD	40,101	177,943	218,044
SMAQMD	102,976	533,828	636,804
SJVACD	50,216	177,943	228,159

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-43).

As shown in Table 22-54, construction of Alternative 2A would generate a total of 1.4 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 2A would generate a total of 1.4 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 2A would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-56).

Table 22-56 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-56 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-56. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 2A (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e} NEPA Point of Comparison	Electricity CO_{2e} CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
Emissions without State Targets						
2025 Conditions	268	-	215,005	0	-	215,273
2060 Conditions	268	384,523	64,896	-37,386	347,423	27,795
Emissions with State Targets						
2025 Conditions	228	-	164,262	0	-	164,490
2060 Conditions	226	293,771	49,580	-37,386	256,629	12,439

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 2A to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-22 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-22 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 2A would add approximately 1,234 GWh[31] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this

[31] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,234 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 2A including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-9 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 2A. As shown in Figure 22-9, in 2024, the year BDCP Alternative 2A is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.5 million metric tons of CO_2e. This elevated level is approximately 200,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2038 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 2A is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 2A would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-57 below shows how the REPP could be modified to accommodate BDCP Alternative 2A, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,300 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,292 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, almost 2,200 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-10 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 2A.

Table 22-57. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 2A)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	197
2026–2030	72	72
2031–2040	108	58
2041–2050	144	59
Total Cumulative	52,236	54,411

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 2A would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 2A would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 2A is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 2A would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 2A with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 2A, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 2A, however, would result in an increase of 166 GWh in the demand

for CVP generated electricity, which would result in a reduction of 93 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (93 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 93 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 28,123 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 21,455 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 2A would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 2A would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 2A would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion**:** The restoration and enhancement actions under Alternative 2A could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.6 Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)

A total of five intakes would be constructed under Alternative 2B. For the purposes of this analysis, it was assumed that Intakes 1–5 or Intakes 1–3 and 6–7 would be constructed under Alternative 2B. Under this alternative, an intermediate pumping plant would be constructed; the water conveyance facility would be a canal, and an operable barrier would be installed (Figures 3-4 and 3-5 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 2B would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 2B electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Electricity demand for construction of Alternative 2B would be to equal demand required for Alternative 1B. Electricity emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. Refer to Table 22-25 for a summary of electricity-related criteria pollutants during construction (years 2014 through 2022) of Alternative 1B that are applicable to this alternative. Operational emissions would be different from Alternative 1B and are provided in Table 22-58.

Table 22-58. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 2B (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	1	6	109	7	7	200
2060	NEPA	1	13	217	14	14	399
2060	CEQA	0	1	15	1	1	27

NEPA = Compares criteria pollutant emissions after implementation of Alternative 2B to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 2B to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, Air Quality Analysis Assumptions).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Alternative 2B would comprise physical/structural components similar to those under Alternative 1B, but would entail an operable barrier along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River). Emissions generated by construction of all features other than the head of Old River barrier under Alternative 1B would be representative of emissions generated by Alternative 2B (refer to Table 22-26).

The head of Old River barrier would be constructed within the SJVAPCD during the last three years of construction (2020 and 2022). To ensure the emissions analysis within the SJVAPCD accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAPCD under Alternative 1B. The resulting emissions are provided in Table 22-59. Violations of the air district thresholds are shown in underlined text.

Table 22-59. Criteria Pollutant Emissions from Construction of Alternative 2B within the SJVAPCD (tons/year)

				PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	6	47	21	0	0	1	0	0	0	0
2015	64	497	235	9	3	12	1	3	4	1
2016	83	630	316	14	4	17	2	4	5	1
2017	50	361	198	10	2	12	1	2	3	1
2018	27	184	111	6	1	7	1	1	2	1
2019	15	96	62	4	1	5	1	1	1	0
2020	5	30	22	2	0	2	0	0	0	0
2021	2	11	8	1	0	1	0	0	0	0
2022	0	0	0	1	0	1	0	0	0	0
Thresholds	10	10	-	-	-	15	-	-	15	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 2B would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 2B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2B within the SMAQMD was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-26, emissions would exceed SMAQMD's daily NO_X threshold for all years between 2014 and 2019, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's concentration-based threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River. See the discussion of Impact AQ-2 under Alternative 1B.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-26, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[32] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which

[32] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2B within the BAAQMD was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-26, emissions would exceed BAAQMD's daily NO_X thresholds for all years between 2015 and 2021, even after implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect. While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the BAAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay. See the discussion of Impact AQ-3 under Alternative 1B.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-26, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. Mitigation Measures AQ-3a and AQ-3b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-59, emissions would exceed SJVAPCD's annual thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2015 through 2019
- NO_X: 2014 through 2021
- PM10: 2016

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the SJVAPCD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as the intermediate pumping plant and all construction sites along the east conveyance alignment. PM10 emissions would be highest in the vicinity of the concrete batch plants. For a map of the proposed east alignment, see Mapbook Figure M3-2.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-59, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

CEQA Conclusion**:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 2B would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 2B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-27, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-27, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-27, emissions would not exceed SJVAPCD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1B within the SFNA and SFBAAB would be representative of emissions generated by Alternative 2B (refer to Table 22-28). Due to the operable barrier at head of Old River, emissions within the SJVAB would be slightly higher than those quantified for Alternative 1B. To ensure the emissions analysis within the SJVAB accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAB under Alternative 1B. The resulting emissions are provided in Table 22-60. Violations of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Table 22-60. Criteria Pollutant Emissions from Construction and Operation of Alternative 2B in the SJVAB (tons/year)

Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	6	47	21	1	0	0
2015	64	497	235	12	4	1
2016	83	630	316	17	5	1
2017	50	361	198	12	3	1
2018	27	184	111	7	2	1
2019	15	96	62	5	1	0
2020	5	30	22	2	0	0
2021	2	11	8	1	0	0
2022	0	0	0	1	0	0
2025	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.00	0.01	0.01	0.00	0.00	0.00
De Minimis	10	10	100	100	100	100

Sacramento Federal Nonattainment Area

As shown in Table 22-28, implementation of Alternative 2B would exceed SFNA federal *de minimis* threshold for NO_X for all years between 2015 and 2018. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2015 and 2018.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-60, implementation of Alternative 2B would exceed SJVAB federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2015 through 2019
- NO_X: 2014 through 2021
- CO: 2015 through 2018

ROG and NO_X are precursors to ozone, for which the SJVAB is in nonattainment for the NAAQS. Likewise, the SJVAB is current classified as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SJVAB ozone and CO SIPs for each year of construction for which the *de minimis* thresholds are exceed.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional ROG or NO_X as construction-related ROG and NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or contributions to the SJVAPCD's VERA. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SJVAB federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. In the event that Alternative 2B is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for CO through a local air quality modeling analysis (i.e., dispersion modeling) to ensure project emissions do not cause or contribute to any new violation of the CO NAAQS or increase the frequency or severity of any existing violation of the CO NAAQS.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-28, implementation of the Alternative 2B would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional ozone in the SFNA and SJVAB. These measures would therefore ensure total direct and indirect ozone emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Accordingly, a positive conformity determination has been made for emissions within the SMAQMD, SJVAB (ROG and NO_X only), SFBAAB (see Appendix 22E, *Conformity Letters*). This impact would be less than significant with mitigation.

General conformity cannot be satisfied for CO through the purchase of offsets within the SJVAB. Accordingly, this impact would be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

This alternative would not generate DPM emissions within the YSAQMD. Although construction required for Alternative 2B was assumed to equal that for Alternative 1B, health threats in Yolo County may differ from Alternative 1B because Alternative 2B includes different intakes (intakes 1,2,3,6,7 for 2B as compared to intakes 1,2,3,4,5 for 1B). These intakes are in Sacramento County directly across the Sacramento River from sensitive receptors in Yolo County. Consequently, the health threat to Yolo County sensitive receptors for Alternative 2B will likely differ from Alternative 1B.

Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2B would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-61) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threat during construction would not be adverse.

***CEQA Conclusion*:** The DPM generated during Alternative 2B construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Table 22-61. Alternative 2B Health Threats in the Yolo-Solano Air Quality Management District

Alternative 2B	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0004	1.0 per million
Thresholds	1	10 per million

Source: Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.
MEI = maximally exposed individual.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-26, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions, Alternative 2B would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-62) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2B construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Table 22-62. Alternative 2B Health Threats in the Sacramento Metropolitan Air Quality Management District

Alternative 2B	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0008	2.4 per million
Thresholds	1	10 per million

Source: Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.
MEI = maximally exposed individual.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 2B was assumed to equal activity required for Alternative 1B. However, because Alternative 2B includes different intakes (1,2,3,6,7, as compared to 1,2,3,4,5 for Alternative 1B, the health threats could differ. Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-59, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2B would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-63) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-59). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-63, this alternative would generate PM2.5 concentrations that would exceed the SJVAPCD's PM2.5 thresholds, and would expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would be adverse. Mitigation Measure AQ-12 is available to reduce this effect.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2B construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would exceed the SJVAPCD's thresholds (Table 22-31) and, thus, would expose sensitive receptors to substantial pollutant concentrations and significant health threats. DWR has identified several environmental commitments to reduce construction-related emissions, including DPF for heavy-duty construction equipment, which are incorporated in the emissions modeling shown in Table 22-26. DPF are anticipated to reduce DPM by approximately 85%, compared to engines without a DPF (see Appendix 22A, *Air Quality Analysis Assumptions*). While this commitment will substantially reduce DPM and associated health threats, PM2.5 concentrations would still exceed the SJVPACD's 24-hour PM2.5 threshold.

The primary cause of these PM2.5 exceedances is a proposed concrete batch plant that would be located in San Joaquin County just south of the Consumnes River and west of the canal alignment. This batch plant would cause exceedances at two residences located just north of the plant. The plant would be located within 500 feet of the closest residence and within 700 feet of the second closest residence. Both residences could be exposed to PM2.5 concentrations that exceed the SJVAPCD's 24-hour PM2.5 significance threshold. Mitigation Measure AQ-12 would be available to reduce PM2.5 exposure to a less-than-significant level by reducing PM2.5 concentrations to levels below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-12: Increase Distance between Batch Plant and Sensitive Receptors

Please see Mitigation Measure AQ-12 under Impact AQ-12 in the discussion of Alternative 1B.

Table 22-63. Alternative 2B Health Threats in the San Joaquin Valley Air Pollution Control District

Alternative 2B	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Total (μg/m^3)	PM2.5 24-hour Total (μg/m^3)
Maximum Value at MEI	0.0003	0.76 per million	0.13	5.14
Thresholds	1	10 per million	0.6	2.5

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
Note: Total PM2.5 thresholds includes PM2.5 exhaust emissions and fugitive dust-generated emissions.
MEI = maximally exposed individual.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-26, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled

DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-64) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 2B construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's threshold (Table 22-64) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Table 22-64. Alternative 2B Health Threats in the Bay Area Air Quality Management District

Alternative 2B	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Exhaust (μg/m^3)
Maximum Value at MEI	0.0003	0.76 per million	0.0011
Thresholds	1	10 per million	0.3

Source: Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.
MEI = maximally exposed individual.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 2B would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 2B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction is therefore less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG emissions generated by construction of Alternative 2B would be similar to emissions generated for Alternative 1B. However, because Alternative 2B includes an operable barrier at head of Old River, total emissions associated with Alternative 2B would be slightly higher than Alternative 1A due to additional equipment activity. Table 22-65 summarizes GHG emissions associated with Alternative 2B. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions.

Table 22-66 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-66 are therefore provided for information purposes only.

As shown in Table 22-65, construction of Alternative 2B would generate a total of 939,372 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 2B would generate a total of 939,372 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Table 22-65. GHG Emissions from Construction of Alternative 2B (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
Emissions with Environmental Commitments				
2014	7,619	6,684	49,544	63,847
2015	89,219	12,495	49,544	151,258
2016	135,329	20,110	49,544	204,983
2017	83,854	25,288	49,544	158,687
2018	51,568	21,346	49,544	122,458
2019	27,612	18,823	49,544	95,980
2020	12,222	7,933	49,544	69,699
2021	4,532	5,337	49,544	59,413
2022	594	5,337	49,544	55,475
Total	412,549	123,354	*445,899*	*981,801*
Emissions with Environmental Commitments and State Mitigation				
2014	7,494	5,977	49,544	63,014
2015	86,760	10,902	49,544	147,206
2016	130,125	17,108	49,544	196,778
2017	79,260	20,966	49,544	149,770
2018	47,936	17,234	49,544	114,714
2019	25,243	14,789	49,544	89,576
2020	10,913	6,061	49,544	66,518
2021	4,034	4,077	49,544	57,656
2022	518	4,077	49,544	54,139
Total	392,283	101,191	*445,899*	*939,372*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-67).

Values may not total correctly due to rounding.

Table 22-66. GHG Emissions from Construction of Alternative 2B by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	28,039	0	28,039
SMAQMD	60,183	222,949	283,132
SJVACD	324,326	222,949	547,276
Emissions with Environmental Commitments and State Mandates			
BAAQMD	26,423	0	26,423
SMAQMD	57,054	222,949	280,003
SJVACD	308,805	222,949	531,754

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-49).

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 2B would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-67).

Table 22-67 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-67 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-67. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 2B (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e}		Concrete Absorption (CO_2)[a]	Total CO_2e	
		NEPA Point of Comparison	CEQA Baseline		NEPA Point of Comparison	CEQA Baseline
Emissions without State Targets						
2025 Conditions	93	-	172,247	0	-	172,340
2060 Conditions	93	342,674	23,047	-18,728	324,039	4,412
Emissions with State Targets						
2025 Conditions	78	-	131,595	0	-	131,673
2060 Conditions	76	261,799	17,608	-18,728	243,148	-1,044

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 2B to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-36 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-36 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 2B would add approximately 1,078 GWh[33] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,078 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 2B including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-11 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 2B. As shown in Figure 22-11, in 2024, the year BDCP Alternative 2B is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.4 million metric tons of CO_2e. This elevated level is approximately 120,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The

[33] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2035 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 2B is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 2B would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-68 below shows how the REPP could be modified to accommodate BDCP Alternative 2B, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,042 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,042 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-11 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 2B.

Table 22-68. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 2B)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	122
2026–2030	72	72
2031–2040	108	53
2041–2050	144	74
Total Cumulative	52,236	48,761

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 2B would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 2B would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 2B is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 2B would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 2B with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 2B, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 2B, however, would result in an increase of 93 GWh in the demand for CVP generated electricity, which would result in a reduction of 93 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (93 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 93 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 28,123 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 21,455 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 2B would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 2B would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 2B would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion**:** The restoration and enhancement actions under Alternative 2B could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.7 Alternative 2C—Dual Conveyance with West Alignment Intakes W1–W5 (15,000 cfs; Operational Scenario B)

A total of five intakes would be constructed under Alternative 2C. They would be sited on the west bank of the Sacramento River, opposite the locations identified for the pipeline/tunnel and east alignments. Under this alternative, water would be carried south in a canal along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay (Figures 3-6 and 3-7 in Chapter 3, *Description of Alternatives*). The severity and location of effects are anticipated to be similar to Alternative 1C.

Construction and operation of Alternative 2C would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 2C electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Electricity demand for construction of Alternative 2C would be to equal demand required for Alternative 1C. Electricity emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. Refer to Table 22-38 for a summary of electricity-related criteria pollutants during construction (years 2014 through 2022) of Alternative 1C that are applicable to this alternative. Operational emissions would be different from Alternative 1C and are provided in Table 22-69.

Table 22-69. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 2C (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	1	8	136	9	9	249
2060	NEPA	1	14	242	16	16	445
2060	CEQA	0	2	40	3	3	73

NEPA = Compares criteria pollutant emissions after implementation of Alternative 2C to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 2C to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Alternative 2C would comprise physical/structural components similar to those under Alternative 1C, but would entail an operable barrier along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River). Emissions generated by construction of all features other than the head of Old River barrier under Alternative 1C would be representative of emissions generated by Alternative 2C (refer to Table 22-39).

The head of Old River barrier would be constructed within the SJVAPCD during the last three years of construction (2020 and 2022). This would be the only feature constructed within the SJVAPCD under Alternative 2B. Emissions associated with construction are shown in Table 22-70. Violations of the air district thresholds are shown in underlined text.

Table 22-70. Criteria Pollutant Emissions from Construction of Alternative 2C within the SJVAPCD (tons/year)

				PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2020	0.3	2.0	1.5	0	0.0	0.0	0.0	0.0	0.0	0.0
2021	0.3	1.8	1.4	0	0.0	0.0	0.0	0.0	0.0	0.0
2022	0.0	0.3	0.2	0	0.0	0.0	0.0	0.0	0.0	0.0
Thresholds	10	10	-	-	-	15	-	-	15	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-39, construction emissions would exceed YSAQMD's thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG (annual): 2015 through 2018
- NO_X (annual): 2014 through 2020

- PM10 (daily): 2015 through 2018

While equipment could operate at any work area identified for this alternative, the highest level of emissions in the YSAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the YSAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-39, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Mitigation Measures AQ-2a and AQ-2b would be available to reduce ROG, NO_X, and PM10 through contracts with SMAQMD that result in offsite mitigation within the YSAQMD. Although Mitigation Measures AQ-2a and AQ-2b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[34] Accordingly, this effect would be adverse.

CEQA Conclusion**:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed YSAQMD's thresholds identified in Table 22-9. The YSAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce ROG, NO_X, and PM10, given the magnitude of estimated emissions, neither measure would reduce ROG and NO_X below district thresholds. Accordingly, this effect would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

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[34] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-39, emissions would exceed SMAQMD's daily NO_X threshold for years 2014 and 2019, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's concentration-based threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. See the discussion of Impact AQ-2 under Alternative 1C.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-39, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, neither measure would reduce NO_X emissions below district thresholds. Likewise, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5).[35] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, neither measure would reduce NO_X emissions below district thresholds. No feasible

[35] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5)emissions. This impact would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-39, construction emissions would exceed BAAQMD's daily thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2015 through 2019
- NO_X: 2014 through 2020

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-39, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and result in an adverse effect to air quality. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would not reduce emissions below district thresholds.[36] Accordingly, this effect would be adverse.

[36] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would not reduce emissions below district thresholds. Accordingly, this impact would be significant and unavoidable.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds of significance. As noted above, the BAAQMD does not currently have an offset program for ROG or NO_X emissions. Consequently, no feasible measures in addition to those specified as environmental commitments would be available to further reduce air quality impacts. This impact would be significant and unavoidable.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-70, construction emissions would associated with the head of Old River barrier are well below SJVAPCD thresholds for all criteria pollutants. Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed SJVAPCD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-40, emissions would not exceed YSAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed YSAQMD's thresholds for criteria pollutants. The YSAQMD's emissions thresholds (Table 22-

9) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate YSAQMD's thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SFNA. The impact would be less than significant.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-40, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 2C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-40, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 2C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 2C would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate SJVAPCD thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SJVAB. This impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1C within the SFNA and SFBAAB would be representative of emissions generated by Alternative 2C (refer to Table 22-41). Due to the operable barrier at head of Old River, a minor amount of emissions would be generated in the SJVAB under Alternative 2C. These emissions would be generated during the last three years of construction and are presented in Table 22-71. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-71. Criteria Pollutant Emissions from Construction and Operation of Alternative 2C in the SJVAB (tons/year)

Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2020	0.3	2.0	1.5	0.0	0.0	0.0
2021	0.3	1.8	1.4	0.0	0.0	0.0
2022	0.0	0.3	0.2	0.0	0.0	0.0
De Minimis	10	10	100	100	100	100

Sacramento Federal Nonattainment Area

As shown in Table 22-41, implementation of Alternative 2C would exceed SFNA federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2015 through 2017
- NO_X: 2014 through 2019
- CO: 2015 through 2018

ROG and NO_X are precursors to ozone, for which the SFNA is in nonattainment for the NAAQS. Likewise, the SFNA is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and CO would conform to the appropriate SFNA ozone and CO SIPs for each year of construction for which the *de minimis* thresholds are exceeded.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SFNA federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. Likewise, although Mitigation Measures AQ-2a and AQ-2b would reduce ROG and NO_X, given the magnitude of emissions, neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 2C is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for ROG, NO_X, and CO through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-71, emissions generated by construction of the head of Old River barrier would not exceed any of the SJVAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SJVAB SIPs.

San Francisco Bay Area Air Basin

As shown in Table 22-41, implementation of Alternative 2C would exceed SFBAAB federal *de minimis* thresholds for the following pollutants and years.

- NO_X: 2015 through 2017
- CO: 2016

NO_X is a precursor to ozone, for which the SFBAAB is in nonattainment for the NAAQS. Likewise, the SFBAAB is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for NO_X and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SFBAAB ozone and CO SIPs.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SFBAAB federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. Likewise, although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X, given the magnitude of emissions, neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 2C is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and CO through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

CEQA Conclusion: SFNA and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. General conformity cannot be satisfied for ROG, NO_X, CO through the purchase of offsets within the SFNA, or for NO_X and CO within the SFBAAB. A positive conformity determination for ROG, NO_X, CO in the SFNA and NO_X and CO in the SFBAAB cannot be reached. This impact would therefore be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by 2C. The health threats generated by construction of Alternative 2C in the YSAQMD would equal the threats shown in Table 22-42.

Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-42) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** The DPM generated during Alternative 2C construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by Alternative 2C. The health threats generated by construction of Alternative 2C in the SMAQMD would equal the estimates shown in Table 22-43.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results.

Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-43) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: The health threats resulting from DPM generated by Alternative 1C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by 2C. The health threats generated by construction of Alternative 2C in the SJVAPCD would equal the estimates shown in Table 22-44.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2C would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-44) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-39). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-42, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** The DPM generated during Alternative 1C construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the SJVAPCD's thresholds (Table 22-44) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by Alternative 2C. The health threats generated by construction of Alternative 2C in the BAAQMD would equal the estimates shown in Table 22-45.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 2C would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-45) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-39). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-43, this alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: The DPM generated during Alternative 2C construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's thresholds (Table 22-45) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 2C would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects. ***CEQA Conclusion:*** Alternative 2C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG emissions generated by construction of Alternative 2C would be similar to emissions generated for Alternative 1C. However, because Alternative 2C includes an operable barrier at head of Old River, total emissions associated with Alternative 2C would be slightly higher than Alternative 1C due to additional equipment activity. Table 22-72 summarizes GHG emissions associated with Alternative 2C. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions.

Table 22-72. GHG Emissions from Construction of Alternative 2C (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
Emissions with Environmental Commitments				
2016	3,333	6,563	76,859	86,755
2017	72,344	10,267	76,859	159,471
2018	131,640	13,742	76,859	222,241
2019	91,211	36,773	76,859	204,843
2020	54,773	51,129	76,859	182,762
2021	27,022	59,569	76,859	163,451
2022	9,083	36,373	76,859	122,316
2023	3,668	12,782	76,859	93,310
2024	1,146	12,782	76,859	90,787
Total	*394,220*	*239,981*	*691,735*	*1,325,936*
Emissions with Environmental Commitments and State Mitigation				
2016	3,278	5,868	76,859	86,006
2017	70,278	8,958	76,859	156,095
2018	126,478	11,691	76,859	215,028
2019	86,094	30,487	76,859	193,440
2020	50,785	41,280	76,859	168,924
2021	24,612	46,803	76,859	148,274
2022	8,065	27,789	76,859	112,713
2023	3,240	9,765	76,859	89,865
2024	998	9,765	76,859	87,623
Total	*373,829*	*192,405*	*691,735*	*1,257,970*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-74).

Values may not total correctly due to rounding.

Table 22-73 summarizes total GHG emissions that would be generated in the YSAQMD, BAAQMD, SMAQMD, and SJVAPCD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-73 are therefore provided for information purposes only.

Table 22-73. GHG Emissions from Construction of Alternative 2C by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	133,736	276,694	410,430
SMAQMD	42,181	0	42,181
YSAQMD	216,899	415,041	631,940
SJVAPCD	1,404	0	1,404
Emissions with Environmental Commitments and State Mandates			
BAAQMD	126,745	276,694	403,439
SMAQMD	39,810	0	39,810
YSAQMD	206,035	415,041	621,076
SJVAPCD	1,239	0	1,239

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-16).

As shown in Table 22-72, construction of Alternative 2C would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 2C would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 2C would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-74).

Table 22-74 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-74 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-74. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 2C (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e}: NEPA Point of Comparison	Electricity CO_{2e}: CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e: NEPA Point of Comparison	Total CO_2e: CEQA Baseline
Emissions without State Targets						
2025 Conditions	99	-	214,399	0	-	214,497
2060 Conditions	99	382,703	63,076	-29,053	353,749	34,122
Emissions with State Targets						
2025 Conditions	79	-	163,798	0	-	163,877
2060 Conditions	77	292,381	48,190	-29,053	263,405	19,213

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 2C to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-49 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-49 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 2C would add approximately 1,178 GWh[37] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,178 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 2C including any additional energy associated with additional water being moved through the system.

[37] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-13 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 2C. As shown in Figure 22-13, in 2024, the year BDCP Alternative 2C is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to over 1.4 million metric tons of CO_2e. This elevated level is approximately 160,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2037 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 2C is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 2C would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-75 below shows how the REPP could be modified to accommodate BDCP Alternative 2C, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,042 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,112 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-14 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 2C.

Table 22-75. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 2C)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	152
2026–2030	72	72
2031–2040	108	63
2041–2050	144	74
Total Cumulative	52,236	51,041

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 2C would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 2C would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 2C is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 2C would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 2C with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 2C, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 2C, however, would result in an increase of 93 GWh in the demand

for CVP generated electricity, which would result in a reduction of 93 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (93 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 93 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 28,123 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 21,455 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 2C would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 2C would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 2C would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion**:** The restoration and enhancement actions under Alternative 2C could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)

A total of two intakes would be constructed under Alternative 3. For the purposes of this analysis, it was assumed that Intakes 1–2 would be constructed under Alternative 3. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-8 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 3 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 3 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-76, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-76. Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 3 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	2	0	0	4
2017	-	0	0	3	0	0	6
2018	-	0	0	8	1	1	15
2019	-	0	2	40	3	3	74
2020	-	0	3	59	4	4	109
2021	-	0	4	69	5	5	127
2022	-	0	3	44	3	3	80
2023	-	0	1	15	1	1	27
2024	-	0	1	15	1	1	27
2025	CEQA	1	13	220	15	15	404
2060	NEPA	2	17	291	19	19	535
2060	CEQA	1	5	89	6	6	163

NEPA = Compares criteria pollutant emissions after implementation of Alternative 3 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 3 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-77 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

Table 22-77. Criteria Pollutant Emissions from Construction of Alternative 3 (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	2	14	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	26	195	110	5	2	7	1	2	3	1	2	18	10	0	0	0	0	0	0	0
2018	18	132	86	5	1	7	1	1	2	1	2	17	11	0	0	0	0	0	0	0
2019	103	674	443	6	5	11	1	5	6	3	11	73	49	0	1	1	0	1	1	0
2020	71	434	316	6	3	10	1	3	4	2	8	47	35	0	0	1	0	0	0	0
2021	17	85	71	5	1	6	1	1	1	0	3	15	13	0	0	0	0	0	0	0
2022	15	72	65	5	0	6	1	0	1	0	0	2	2	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	90	421	470	7	2	9	1	2	3	2	2	8	10	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	42	320	165	0	3	3	0	3	3	2	3	22	11	0	0	0	0	0	0	0
2017	139	1,004	549	34	6	40	5	6	12	3	9	65	37	2	1	3	0	1	1	0
2018	182	1,256	755	34	8	43	5	8	13	4	15	109	65	2	1	3	0	1	1	0
2019	129	856	554	34	5	39	5	5	10	2	12	81	55	2	1	3	0	1	1	0
2020	69	425	363	33	3	36	5	3	8	1	8	50	41	2	0	2	0	0	1	0
2021	35	180	174	33	1	34	5	1	6	1	4	22	22	2	0	2	0	0	0	0
2022	39	200	192	33	1	34	5	1	6	1	4	22	21	2	0	2	0	0	0	0
2023	24	130	132	4	1	5	4	1	4	0	1	3	4	2	0	2	0	0	0	0
2024	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	28	208	101	0	1	1	0	1	1	0	1	6	3	0	0	0	0	0	0	0
2017	26	187	98	22	1	23	3	1	4	0	1	11	6	2	0	2	0	0	0	0
2018	53	382	246	22	2	25	3	2	6	2	3	21	14	2	0	2	0	0	0	0
2019	55	336	263	23	3	25	3	3	6	2	5	31	25	2	0	2	0	0	1	0
2020	51	287	251	23	3	25	3	3	6	2	8	46	41	2	0	2	0	0	1	0
2021	40	208	203	22	2	24	3	2	6	2	7	37	36	2	0	2	0	0	1	0
2022	36	190	199	22	2	24	3	2	5	2	5	26	26	2	0	2	0	0	1	0
2023	22	124	112	3	1	4	3	1	4	0	3	18	17	2	0	2	0	0	0	0
2024	21	115	111	3	1	4	3	1	4	0	1	4	3	2	0	2	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 3 would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-78 summarizes criteria pollutant emissions associated with operation of Alternative 3 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-78. Criteria Pollutant Emissions from Operation of Alternative 3 (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.18	1.59	1.44	0.06	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.17	1.54	1.26	0.05	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.34	3.09	2.51	0.11	0.10	0.03	0.01	0.08	0.09	0.00	0.00	0.00
2060	0.33	3.03	2.31	0.11	0.10	0.03	0.01	0.08	0.08	0.00	0.00	0.00
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.17	1.58	1.30	0.06	0.05	0.01	0.00	0.02	0.02	0.00	0.00	0.00
2060	0.17	1.53	1.19	0.05	0.05	0.01	0.00	0.02	0.02	0.00	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 3 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 3 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-77, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 would exceed the district's concentration-based threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including all intake and intake pumping plant sites and the intermediate forebay site, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5) would exceed the district's threshold

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions however, as shown in Table 22-77, NO_X emissions would still exceed the air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[38] Accordingly, this would be an adverse effect.

[38] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-77, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019, 2020, and 2024
- NO_X: 2017 through 2022 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-77, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-77, construction emissions would exceed SJVAPCD's annual NO_X threshold for years 2017 and 2023, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-77, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 3 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 3 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-78, operation and maintenance activities under Alternative 3 would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-78, operation and maintenance activities under Alternative 3 would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SJVPACD are expected at construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. As shown in Table 22-78, operation and maintenance activities under Alternative 3 would not exceed SJVAPCD's thresholds of significance (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 3 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-79. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-79. Criteria Pollutant Emissions from Construction and Operation of Alternative 3 in the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	3	22	11	0	0	0
2017	9	65	37	3	1	0
2018	15	109	65	3	1	0
2019	12	81	55	3	1	0
2020	8	50	41	2	1	0
2021	4	22	22	2	0	0
2022	4	22	21	2	0	0
2023	1	3	4	2	0	0
2024	0	0	0	0	0	0
2025	0.01	0.08	0.09	0.00	0.00	0.00
2060	0.01	0.08	0.08	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	1	6	3	0	0	0
2017	1	11	6	2	0	0
2018	3	21	14	2	0	0
2019	5	31	25	2	1	0
2020	8	46	41	2	1	0
2021	7	37	36	2	1	0
2022	5	26	26	2	1	0
2023	3	18	17	2	0	0
2024	1	4	3	2	0	0
2025	0.00	0.02	0.02	0.00	0.00	0.00
2060	0.00	0.02	0.02	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*
	San Francisco Bay Area Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	2	18	10	0	0	0
2018	2	17	11	0	0	0
2019	11	73	49	1	1	0
2020	8	47	35	1	0	0
2021	3	15	13	0	0	0
2022	0	2	2	0	0	0
2023	0	0	0	0	0	0
2024	2	8	10	0	0	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-79, implementation of Alternative 3 would exceed SFNA federal *de minimis* threshold for NO_X for all years between 2017 and 2020. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2017 and 2020.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-79, implementation of Alternative 3 would exceed SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which requires additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-79, implementation of the Alternative 3 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*), this impact would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources

of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-77, construction of Alternative 3 would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 3 would be similar to Alternative 1A. As shown in Table 22-15, Alternative 3 would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 3 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-77, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion*

Modeling and Health Risk Assessment for Construction Emissions, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 3 would be similar to Alternative 1A. As shown in Table 22-16, Alternative 3 would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 3 construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-77, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 3 would be similar to Alternative 1A. As shown in Table 22-17, Alternative 3 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-77). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 3 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-77, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 3 would be similar to Alternative 1A. As shown in Table 22-18, Alternative 3 would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 3 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 3 would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 3 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 3 are presented in Table 22-80. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-81 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-48). GHG emissions presented in Table 22-81 are therefore provided for information purposes only.

Construction of Alternative 3 would generate a total of 1.2 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding approximately 248,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

Table 22-80. GHG Emissions from Construction of Alternative 3 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[b]	Total CO_2e
Emissions with Environmental Commitments				
2016	4,648	3,100	85,350	93,098
2017	17,160	4,861	85,350	107,372
2018	29,603	12,257	85,350	127,210
2019	42,465	61,885	85,350	189,700
2020	38,199	93,462	85,350	217,012
2021	23,582	109,309	85,350	218,242
2022	16,036	69,106	85,350	170,492
2023	6,301	23,366	85,350	115,017
2024	4,739	23,366	85,350	113,455
Total	*182,735*	*400,710*	*768,154*	*1,351,600*
Emissions with Environmental Commitments and State Mandates				
2016	4,475	2,637	85,350	92,462
2017	16,240	4,030	85,350	105,621
2018	27,524	9,896	85,350	122,770
2019	38,754	48,622	85,350	172,726
2020	33,998	71,404	85,350	190,753
2021	20,945	83,511	85,350	189,807
2022	14,263	52,796	85,350	152,409
2023	5,622	17,851	85,350	108,823
2024	4,227	17,851	85,350	107,428
Total	*166,048*	*308,597*	*768,154*	*1,242,799*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-82).

Values may not total correctly due to rounding.

CEQA Conclusion: Construction of Alternative 3 would generate a total of 1.2 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Table 22-81. Total CO_2e Emissions from Construction of Alternative 3 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	44,094	153,631	197,725
SMAQMD	84,117	460,893	545,009
SJVACD	54,524	153,631	208,155
Emissions with Environmental Commitments and State Mandates			
BAAQMD	40,101	153,631	193,732
SMAQMD	76,969	460,893	537,862
SJVACD	48,978	153,631	202,608

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-82).

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 3 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-82).

Table 22-82 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-82 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-82. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 3 (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e} NEPA Point of Comparison	Electricity CO_{2e} CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
Emissions without State Targets						
2025 Conditions	107	-	347,223	0	-	347,330
2060 Conditions	107	460,032	140,405	-32,262	427,877	108,250
Emissions with State Targets						
2025 Conditions	91	-	265,274	0	-	265,366
2060 Conditions	90	351,459	107,268	-32,262	319,287	75,096

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 3 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-83 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-83 are therefore provided for information purposes only.

Table 22-83. Total CO_2e Emissions from Operation and Maintenance of Alternative 3 by Air District (metric tons/year)

Year	Emissions without State Mandates	Emissions with State Mandates
Early Late (2025)		
SMAQMD	84	69
SJVAPCD	21	20
BAAQMD	2	2
Late-Long Term (2060)		
SMAQMD	84	68
SJVAPCD	21	20
BAAQMD	2	2

[a] Emissions do not include emissions generated by increased electricity usage.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 3 would add approximately 1,514 GWh[39] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this

[39] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,514 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 3 including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-15 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 3. As shown in Figure 22-16, in 2024, the year BDCP Alternative 3 is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to around 1.6 million metric tons of CO_2e. This elevated level is approximately 300,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2042 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 3 is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 3 would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-84 below shows how the REPP could be modified to accommodate BDCP Alternative 3, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,514 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,492 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-16 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 3.

Table 22-84. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 3)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	247
2026–2030	72	72
2031–2040	108	63
2041–2050	144	74
Total Cumulative	52,236	61,111

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 3 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 3 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 3 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 3 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 3 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 3, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 3, however, would result in an increase of 166 GWh in the demand

for CVP generated electricity, which would result in a reduction of 166 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (166 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 166 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 50,198 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 38,296 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 3 would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 3 would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation’s lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 3 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion: The restoration and enhancement actions under Alternative 3 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.9 Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H)

A total of three intakes would be constructed under Alternative 4. For the purposes of this analysis, it was assumed that Intakes 2, 3, and 5 (on the east bank of the Sacramento River) would be constructed under Alternative 4. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-9 and 3-10 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 4 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 4 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-86 for Alternative 4 Scenarios H1 through H4, are therefore provided for informational purposes only and are not included in the impact conclusion.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-86 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

Table 22-85. Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 4 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	6	0	0	11
2017	-	0	1	9	1	1	16
2018	-	0	1	19	1	1	34
2019	-	0	5	83	6	6	152
2020	-	1	7	120	8	8	221
2021	-	1	8	140	9	9	258
2022	-	1	5	89	6	6	163
2023	-	0	2	30	2	2	55
2024	-	0	2	30	2	2	55
Scenario H1							
2025	CEQA	1	9	162	11	11	299
2060	NEPA	2	15	265	18	18	488
2060	CEQA	0	4	63	4	4	116
Scenario H2							
2025	CEQA	0	-1	-11	-1	-1	-19
2060	NEPA	1	6	104	7	7	192
2060	CEQA	-1	-6	-98	-7	-7	-180
Scenario H3							
2025	CEQA	0	4	68	5	5	124
2060	NEPA	1	10	175	12	12	322
2060	CEQA	0	-2	-27	-2	-2	-50
Scenario H4							
2025	CEQA	-1	-6	-98	-7	-7	-179
2060	NEPA	0	1	19	1	1	35
2060	CEQA	-1	-11	-183	-12	-12	-337

NEPA = Compares criteria pollutant emissions after implementation of Alternative 4 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 4 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

Table 22-86. Criteria Pollutant Emissions from Construction of Alternative 4 (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	2	14	11	22	0	22	3	0	4	0	0	0	0	2	0	2	0	0	0	0
2017	13	105	64	22	1	23	3	1	5	1	2	17	10	2	0	2	0	0	1	0
2018	27	194	118	23	2	24	3	2	5	1	3	22	13	2	0	2	0	0	1	0
2019	124	835	523	41	5	46	6	5	10	3	12	83	53	4	1	5	1	1	1	0
2020	167	1,030	723	24	6	30	4	6	10	3	18	114	77	2	0	2	0	0	1	0
2021	78	506	391	23	3	26	4	3	6	1	7	49	33	2	0	2	0	0	1	0
2022	41	286	190	23	2	24	3	2	5	1	4	28	18	2	0	2	0	0	0	0
2023	51	284	299	22	2	24	3	2	5	1	1	9	9	2	0	2	0	0	0	0
2024	93	450	481	60	2	62	7	2	10	2	2	12	11	3	1	4	0	1	2	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	41	325	178	0	3	4	0	3	3	3	3	23	13	0	0	0	0	0	0	0
2017	85	610	352	36	4	40	5	4	10	2	4	30	17	2	0	2	0	0	1	0
2018	115	807	496	36	6	42	5	6	11	3	8	60	36	2	0	2	0	0	1	0
2019	104	651	450	37	5	41	6	5	10	3	10	64	45	2	0	2	0	0	1	0
2020	61	433	360	35	3	37	5	3	8	1	7	44	36	2	0	2	0	0	1	0
2021	21	151	130	33	1	35	5	1	7	0	3	14	14	2	0	2	0	0	0	0
2022	22	121	118	33	1	34	5	1	6	0	3	15	13	1	0	2	0	0	0	0
2023	9	51	47	33	0	33	5	0	5	0	1	6	6	1	0	2	0	0	0	0
2024	7	39	38	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	27	214	114	0	2	2	0	2	2	1	1	6	3	0	0	0	0	0	0	0
2017	26	194	110	1	2	3	0	2	2	1	3	21	13	0	0	0	0	0	0	0
2018	39	287	185	2	2	5	0	2	3	2	3	19	13	0	0	0	0	0	0	0
2019	78	506	382	3	4	7	0	4	4	2	6	40	30	0	0	1	0	0	0	0
2020	49	286	242	3	3	5	0	3	3	2	6	32	29	0	0	1	0	0	0	0
2021	23	109	116	3	1	3	0	1	1	0	4	20	21	0	0	1	0	0	0	0
2022	34	151	171	3	1	3	0	1	1	0	4	20	22	0	0	1	0	0	0	0
2023	32	164	177	2	1	3	0	1	1	1	5	23	26	0	0	0	0	0	0	0
2024	18	92	96	0	1	1	0	1	1	0	1	3	3	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 4 would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-87 summarizes criteria pollutant emissions associated with operation of Alternative 4 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAMQD). The emissions summarized in Table 22-88 are representative of Scenarios H1 through H4. Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-87. Criteria Pollutant Emissions from Operation of Alternative 4 (Scenarios H1 through H4) (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.27	2.39	2.15	0.08	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.25	2.31	1.90	0.08	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.51	4.64	3.76	0.16	0.15	0.04	0.01	0.12	0.14	0.00	0.00	0.00
2060	0.49	4.54	3.47	0.16	0.15	0.04	0.01	0.12	0.13	0.00	0.00	0.00
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.26	2.36	1.96	0.08	0.08	0.02	0.00	0.04	0.03	0.00	0.00	0.00
2060	0.25	2.29	1.78	0.08	0.07	0.02	0.00	0.04	0.02	0.00	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 4 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 4 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-86, construction emissions associated with Alternative 4 would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2022, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and control structure) site west of South Stone Lake and east of the Sacramento River.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 (and, therefore, PM2.5) would exceed the district's threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including all intake and intake pumping plant sites and the intermediate forebay site, are expected to disturb the most ground on a daily basis.

Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 could exceed the district's concentration-based threshold. Since the project does not meet the screening criteria established by SMAQMD for PM10 emissions, detailed air dispersion modeling of the exhaust and fugitive dust emissions is recommended. As noted above, projects that do not exceed the air district's PM10 concentration-based threshold would not have an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011).

The approach used to evaluate PM10 concentrations is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions.* The results of the modeling are shown in Table 22-88.

Table 22-88. Alternative 4 PM10 Concentration Results in SMAQMD

Parameter	Annual PM 10 Concentration (μg/m^3)	24-hour PM10 Concentration (μg/m^3)
Maximum Value	0.32198	4.97
SMAQMD CEQA Threshold	1	2.5

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
Note: Total PM10 thresholds includes PM10 exhaust emissions and fugitive dust-generated emissions.

As shown in Table 22-88, Alternative 4 would exceed the SMAQMD's PM10 thresholds and, thus, would expose sensitive receptors to substantial particulate matter concentrations. The primary cause of the PM10 impact is a proposed concrete batch plant that would be located in Sacramento

County just south of Twin Cities Road and west of I-5. This batch plant would cause exceedances at two residences located just west and north of the plant. The plant would be located approximately 350 meters from the closest residence and approximately 3,500 meters from the second closest residence. Both residences could be exposed to PM10 concentrations (and, therefore, PM2.5) that exceed the SMAQMD's 24-hour PM10 significance threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Tables 22-86 and 22-88, NO_X and PM10 (and, therefore, PM2.5) emissions would still exceed the air district mass and concentration-based thresholds identified in Table 22-9 and would result in an adverse effect to air quality.

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. Mitigation Measures AQ-2c would be available to reduce exposure to substantial PM10 and PM2.5 concentrations by relocating the two affected receptors near Twin Cities Road. Although Mitigation Measure AQ-2c would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form of exposure to substantial PM concentrations would occur at the two receptor locations near Twin Cities Road. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

CEQA Conclusion**:** NO_X emissions and PM10 (and, therefore, PM2.5) generated during construction would exceed SMAQMD mass and concentration-based thresholds identified in Table 22-9. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9).

Mitigation Measures AQ-2c would be available to reduce PM10 and PM2.5 impacts, but not to a less-than-significant level. The BDCP proponents cannot ensure that the affected landowners will accept DWR's offer for relocation assistance. If the landowners choose not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to substantial PM concentrations would occur at the two receptor locations near Twin Cities Road. Therefore, this impact would be significant and unavoidable. If, however, the landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants[40]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SMAQMD through the creation of offsetting reductions of emissions occurring within the SFNA. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SMAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control district or air quality management CEQA thresholds[41] shall be reduced to quantities below the numeric thresholds (see Table 22-9).[42]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SMAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SMAQMD. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SMAQMD's HDLEVIP. The HDLEVIP is designed to reduce NO_X, PM, and ROG from on- and offroad sources.

SMAQMD's incentive programs are a means of funding projects and programs capable of achieving emissions reductions. The payment fee is based on the average cost to achieve one tpd of reductions based on the average cost for reductions over the previous year. Onroad reductions averaged (nominally) $44 million ($NO_X$ only) and off-road reductions averaged $36 million ($NO_X$ only) over the previous year, thus working out to approximately $40 million per one tpd of reductions. This rate roughly correlates to the average cost effectiveness of the Carl Moyer Incentive Program.

If DWR is successful in reaching what it regards as a satisfactory agreement with SMAQMD, DWR will enter into mitigation contracts with SMAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SMAQMD and/or within another air district within the SFNA. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-8).
- For emissions not in excess of *de minimis* thresholds but above the appropriate SMAQMD standards: **below the appropriate CEQA threshold levels**. (see Table 22-9)

Implementation of this mitigation would require DWR to adopt the following specific responsibilities.

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[40] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[41] According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon make determinations regarding the significance of an impact.

[42] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SVAB and the SMAQMD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

- Consult with the SMAQMD in good faith with the intention of entering into a mitigation contract with SMAQMD for the HDLEVIP. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two years prior to the required mitigation; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SMAQMD should seek clarification and agreement on SMAQMD responsibilities, including the following.
    - Identification of appropriate offsite mitigation fees required for BDCP.
    - Timing required for obtaining necessary offsite emission credits.
    - Processing of mitigation fees paid by DWR.
    - Verification of emissions inventories submitted by DWR.
    - Verification that offsite fees are applied to appropriate mitigation programs within the SFNA.
- Quantify mitigation fees required to satisfy the appropriate reductions. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SFNA. The schedule in which payments are provided to SMAQMD also influences overall cost. For example, a higher rate on a per-tonnage basis will be required for project elements that need accelerated equipment turn-over to achieve near-term reductions, whereas project elements that are established to contract to achieve far-term reductions will likely pay a lower rate on a per-tonnage basis.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SMAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SMAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SMAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SMAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SMAQMD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above SMAQMD CEQA thresholds are met.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SMAQMD as contemplated by Mitigation Measure AQ-2a, or should DWR enter into an agreement with SMAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-2a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-2a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality violations. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-2a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFNA) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SMAQMD, other air districts within the SFNA, and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

DWR will develop pollutant-specific formulas to achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrendered all required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD, the ARB, any relevant air pollution control district within the SFNA, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees or other moneys will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-2b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SMAQMD, the ARB, any relevant air pollution control district within the SFNA, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SMAQMD CEQA thresholds for other pollutants.

Mitigation Measure AQ-2c: Relocate Sensitive Receptors to Avoid Excess Health Threats from Exposure to Particulate Matter

To avoid exposing sensitive receptors to health effects associated with substantial PM (PM10 and PM2.5) concentrations, DWR will provide individuals residing in areas where construction activities associated with the BDCP would create emissions in exceedance of SMAQMD's annual and 24-hour PM10 thresholds the opportunity to relocate either temporarily during the construction period or permanently, at the discretion of the affected individuals. DWR will provide any individuals who accept DWR's offer of relocation full compensation for expenses related to the procurement of either (i) temporary housing during the period in which emissions exceed the 24-hour PM10 threshold (estimated to be approximately 8 years) or permanent replacement housing of the same market value as the housing being vacated by the residents or greater. Under either scenario, DWR will provide, in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act and the California Relocation Assistance Act, relocation and replacement expenses, including relocation advisory services, moving cost reimbursement, and reimbursement for related expenses. Implementation of this mitigation measure will ensure that sensitive receptors will not be exposed to concentrations of PM (PM10 and PM2.5) in exceedance of SMAQMD thresholds, unless they freely choose not to accept to DWR's offer of relocation assistance.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-86, construction emissions associated with Alternative 4 would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019 through 2021 and 2024
- NO_X: 2017 through 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-86, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants[43]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD through the creation of offsetting reductions of emissions occurring within the SFBAAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the BAAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control district or air quality management CEQA thresholds[44] shall be reduced to quantities below the numeric thresholds (see Table 22-9).

DWR will undertake in good faith an effort to enter into a development mitigation contract with BAAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD. The preferred source of emissions reductions for NO_X, ROG, and PM shall be through contributions to BAAQMD's Carl Moyer Program and/or other BAAQMD incentive programs (e.g., TFCA).

If DWR is successful in reaching what it regards as a satisfactory agreement with BAAQMD, DWR will enter into mitigation contracts with BAAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SFBAAB. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-8).
- For emissions not in excess of *de minimis* thresholds but above the appropriate BAAQMD standards: **below the appropriate CEQA threshold levels**. (see Table 22-9)

Implementation of this mitigation would require DWR adopt the following specific responsibilities.

- Consult with the BAAQMD in good faith with the intention of entering into a mitigation contract with BAAQMD for the Carl Moyer Program and/or other BAAQMD emission reduction incentive program. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. In negotiating the terms of the mitigation contract, DWR and BAAQMD should seek clarification and agreement on BAAQMD responsibilities, including the following.

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[43] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[44] According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon make determinations regarding the significance of an impact.

  - Identification of appropriate offsite mitigation fees required for BDCP.
  - Timing required for obtaining necessary offsite emission credits.
  - Processing of mitigation fees paid by DWR.
  - Verification of emissions inventories submitted by DWR.
  - Verification that offsite fees are applied to appropriate mitigation programs within the SFBAAB.
- Quantify mitigation fees required to satisfy the appropriate reductions. Funding for the emission reduction projects will be provided in an amount up to the emission reduction project cost-effectiveness limit set by for the Carl Moyer Program during the year that the emissions from construction are emitted. (The current emissions limit is $17,460 / weighted ton of criteria pollutants [NO_X + ROG + (20*PM)]). An administrative fee of 5% would be paid by DWR to the BAAQMD to implement the program. The funding would be used to fund projects eligible for funding under the Carl Moyer Program guidelines or other BAAQMD emission reduction incentive program meeting the same cost-effectiveness threshold that are real, surplus, quantifiable, and enforceable.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to BAAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to BAAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), BAAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, the DWR will coordinate with BAAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above BAAQMD CEQA thresholds are met.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions

within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with BAAQMD as contemplated by Mitigation Measure AQ-3a, or should DWR enter into an agreement with BAAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-3a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-3a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality violations. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-3a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFBAAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with BAAQMD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

DWR will develop pollutant-specific formulas to achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrendered all required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees or other moneys will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-3b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with BAAQMD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity de minimis thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-86, construction emissions associated with the north-south transmission alignment would exceed SJVAPCD's annual NO_X threshold for all years between 2017 and 2023, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the modified pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment under this alternative, see Mapbook Figure M3-4.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-86, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants[45]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD through the creation of offsetting reductions of emissions occurring within the SJVAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SJVAPCD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control district or air quality management CEQA thresholds[46] shall be reduced to quantities below the numeric thresholds (see Table 22-9).[47]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SJVAPCD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SJVAPCD's VERA. The VERA is implemented through the District Incentive Programs and is a measure to reduce project impacts under CEQA. The current VERA payment fee for construction emissions is \$9,350 per ton of NO_X. Payment fees vary by year (i.e., future year payment fees for NO_X could be in excess of the current price of \$9,350) and are sensitive to the number of projects requiring emission reductions within the same air basin (Siong pers. comm. 2012).

If DWR is successful in reaching what it regards as a satisfactory agreement with SJVAPCD, DWR will enter into mitigation contracts with SJVAPCD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions must occur within the SJVAB. required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)**.

[45] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[46] According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon make determinations regarding the significance of an impact.

[47] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SJVAB and the SJVAPCD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

- For emissions not in excess of *de minimis* thresholds but above the SJVAPCD's standards: **below the appropriate CEQA threshold levels**.

Implementation of this measure would require DWR to adopt the following specific responsibilities.

- Consult with the SJVAPCD in good faith with the intention of entering into a mitigation contract with SJVAPCD for the VERA. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two months (2) prior to groundbreaking; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SJVAPCD should seek clarification and agreement on SJVAPCD responsibilities, including the following.
    - Identification of appropriate offsite mitigation fees required for BDCP.
    - Processing of mitigation fees paid by DWR.
    - Verification of emissions inventories submitted by DWR
    - Verification that offsite fees are applied to appropriate mitigation programs within the SJVAB.
- Quantify mitigation fees required to satisfy the appropriate reductions. An administrative fee of 4% would be paid DWR to the SJVAPCD to implement the program. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SJVAB.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SJVAPCD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SJVAPCD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SJVAPCD and DWR shall determine the disposition of final

funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SJVAPCD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above SJVAPCD CEQA thresholds are met.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SJVAPCD as contemplated by Mitigation Measure AQ-4a, or should DWR enter into an agreement with SJVAPCD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-4a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-4a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality violations. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-4a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SJVAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SJVAPCD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

DWR will develop pollutant-specific formulas to achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to pay all required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees or other moneys will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-4b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SJVAPCD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 4 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 4 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

CEQA Conclusion: Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and control structure) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-87, operation and maintenance activities under Alternative 4 would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-87, operation and maintenance activities under Alternative 4 would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SJVPACD are expected at construction sites along the modified pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment under this alternative, see Mapbook Figure M3-4.

As shown in Table 22-87, operation and maintenance activities under Alternative 4 would not exceed SJVAPCD's thresholds of significance (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 4 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-89. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-89. Criteria Pollutant Emissions from Construction and Operation of Alternative 4 in the SFNA, SJVAB, and SFBAAB (tons/year)

Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
Sacramento Federal Nonattainment Area						
2016	3	23	13	0	0	0
2017	4	30	17	2	1	0
2018	8	60	36	2	1	0
2019	10	64	45	2	1	0
2020	7	44	36	2	1	0
2021	3	14	14	2	0	0
2022	3	15	13	2	0	0
2023	1	6	6	2	0	0
2024	0	1	1	0	0	0
2025	0.01	0.12	0.14	0.00	0.00	0.00
2060	0.01	0.12	0.13	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
San Joaquin Valley Air Basin						
2016	1	6	3	0	0	0
2017	3	21	13	0	0	0
2018	3	19	13	0	0	0
2019	6	40	30	1	0	0
2020	6	32	29	1	0	0
2021	4	20	21	1	0	0
2022	4	20	22	1	0	0
2023	5	23	26	0	0	0
2024	1	3	3	0	0	0
2025	0.00	0.04	0.03	0.00	0.00	0.00
2060	0.00	0.04	0.02	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*
San Francisco Bay Area Air Basin						
2016	0	0	0	2	0	0
2017	2	17	10	2	1	0
2018	3	22	13	2	1	0
2019	12	83	53	5	1	0
2020	18	114	77	2	1	0
2021	7	49	33	2	1	0
2022	4	28	18	2	0	0
2023	1	9	9	2	0	0
2024	2	12	11	4	2	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-89, implementation of Alternative 4 would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2017 and 2020. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2017 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-89, implementation of Alternative 4 would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-89, implementation of Alternative 4 would exceed SFBAAB federal *de minimis* threshold for NO_X in 2020. NO_X is a precursor to ozone, for which the SFBAAB is in nonattainment for the NAAQS. Likewise, the SFBAAB is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for NO_X and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SFBAAB ozone and CO SIPs.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-3a and AQ-3b, which require additional onsite mitigation and/or offsets. Based on the emissions levels currently estimated for Alternative 4 and the current payment fee of $17,460 per ton of NO_X, total mitigation cost is expected to range from $1.0 to $1.1 million.[48] Mitigation Measures AQ-3a and AQ-3b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A

[48] Calculation includes an administrative fee of 5% and only accounts for those years in excess for the federal *de minimis* threshold.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 3a, 3b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SVAB, SFBAAB, and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*), this impact would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-86, construction of Alternative 4 would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 4 would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-90) and, thus, would not expose sensitive receptors to substantial pollutant

concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 4 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-90. Alternative 4 Health Threats in the Yolo-Solano Air Quality Management District

Alternative 4	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0. 00036	1.08 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-86, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 4 would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-91) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 4 construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-91. Alternative 4 Health Threats in the Sacramento Metropolitan Air Quality Management District

Alternative 4	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0. 00104	3.14 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-86, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 4 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-92) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching. Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-92, this alternative would generate PM2.5 concentrations that would exceed the SJVAPCD's PM2.5 thresholds, and would potentially expose sensitive receptors to substantial pollutant concentrations. These exceedances are related to the PM2.5 emissions associated with the concrete batch plant near Byron Highway. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would be adverse. Mitigation Measure AQ-12 is available to address this effect.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 4 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant.

This alternative's PM2.5 emissions during construction would exceed the SJVAPCD's thresholds (Table 22-92) and would potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be significant. The primary cause of the PM2.5 exceedance is a proposed concrete batch plant that would be located in near Byron Highway. This batch plant would cause exceedances at approximately 20 residences on Kings Island. Mitigation Measure AQ-12 would be available to reduce PM2.5 exposure to a less-than-significant level by reducing PM2.5 concentrations to levels below SJVAPCD CEQA thresholds (see Table 22-9)

Table 22-92. Alternative 4 Health Threats in the San Joaquin Valley Air Pollution Control District

Alternative 4	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Total (μg/m^3)	PM2.5 24-hour Total (μg/m^3)
Maximum Value	0. 00083	2.49 per million	0. 15	2.76
Thresholds	1	10 per million	0.6	2.5

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
Note: Total PM2.5 thresholds includes PM2.5 exhaust emissions and fugitive dust-generated emissions.

Mitigation Measure AQ-12: Increase Distance between Batch Plant and Sensitive Receptors

To reduce these PM2.5 health threats to a less than significant level, the concrete batch plant should be relocated so that there is a minimum of 1,500 meters between the plant and the closest residence. A revised HRA should be conducted once the engineering designs and location for the batch plant are finalized to confirm the new location will not result in the exposure of sensitive receptors to concentrations of PM2.5 below the SJVAPCD's 24-hour concentration threshold.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-86, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 4 would not exceed the BAAQMD's chronic non-cancer thresholds (Table 22-93) and, thus, would not expose sensitive receptors to substantial chronic non-cancer health threats. However, one sensitive receptor location would exceed the BAAQMD's cancer risk threshold of 10 in one million during construction of the canals. This sensitive receptor is located near the southern portion of the Alternative 4 alignment along Byron Highway. Construction of the canals could expose this receptor to health threats that would be adverse.

Mitigation Measure AQ-13 is available to address this effect. Mitigation Measures AQ-13 would be available to reduce exposure to excess cancer risk by relocating the affected receptor along Byron Highway. Although Mitigation Measure AQ-13 would reduce the severity of the health effect, the BDCP proponents are not solely responsible for implementation of the measure. If the landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form of exposure to excess cancer risk would occur at the receptor location adjacent to Byron Highway. Therefore, this effect would be adverse. If, however, the landowner accepts DWR's offer of relocation assistance, the effect would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to PM2.5 health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 4 construction would not exceed the BAAQMD's chronic non-cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. However, one sensitive receptor located near the southern portion of the Alternative 4 alignment along Byron Highway would exceed the BAAQMD's cancer risk threshold of 10 in one million during construction of the canals. Therefore, this alternative's effect of exposure of sensitive receptors to cancer health risks during construction would be adverse.

Mitigation Measure AQ-13 would to reduce the severity of this impact, but not to a less-than-significant level. The BDCP proponents cannot ensure that the affected landowner will accept DWR's offer for relocation assistance. If the landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to excess cancer risk would occur at the receptor location adjacent to Byron Highway. Therefore, this impact would be significant and unavoidable. If, however, the landowner accepts DWR's offer of relocation assistance, the impact would be less than significant.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-93) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Table 22-93. Alternative 4 Health Threats in the Bay Area Air Quality Management District

Alternative 4	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Exhaust (μg/m^3)
Maximum Value	0. 00065	19.62 per million	0. 032
Thresholds	1	10 per million	0.3

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Mitigation Measure AQ-13: Relocate Sensitive Receptors to Avoid Excess Cancer Risk from Exposure to Diesel Particulate Matter

To avoid exposing sensitive receptors to health threats associated with substantial DPM concentrations, DWR will provide individuals in areas where construction activities associated with the BDCP would create DPM emissions in exceedance of BAAQMD cancer risk threshold the opportunity to relocate either temporarily during the construction period or permanently, at the discretion of the affected individuals. DWR will provide any individuals who accept DWR's offer of relocation full compensation for expenses related to the procurement of either (i) temporary housing during the period in which emissions exceed the thresholds or permanent replacement housing of the same market value as the housing being vacated by the residents or greater. Under either scenario, DWR will provide, in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act and the California Relocation Assistance Act, relocation and replacement expenses, including relocation advisory services, moving cost reimbursement, and reimbursement for related expenses. Implementation of this mitigation measure will ensure that sensitive receptors will not be exposed to DPM concentrations in excess of BAAQMD cancer risk threshold unless they freely choose not to accept to DWR's offer of relocation assistance.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: The generation and severity of odors is dependent on a number of factors, including the nature, frequency, and intensity of the source; wind direction; and the location of the receptor(s). Odors rarely cause physical harm, but can cause discomfort, leading to complaints to regulatory agencies. Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 4 would not result in the addition of a major odor producing facility.

Diesel emissions from construction equipment may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that the operation or the construction of the project would create objectionable odors. The effect of exposure to odors during construction would not be adverse.

***CEQA Conclusion*:** Alternative 4 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 4 are presented in Table 22-94. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established. Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-94).

Table 22-94. GHG Emissions from Construction of Alternative 4 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments				
2016	4,961	22,347	99,015	126,324
2017	13,451	59,620	99,015	172,087
2018	25,000	104,719	99,015	228,734
2019	58,594	136,301	99,015	293,910
2020	35,838	145,703	99,015	280,556
2021	22,414	146,595	99,015	268,024
2022	14,401	110,188	99,015	223,603
2023	10,069	39,170	99,015	148,254
2024	50,494	8,370	99,015	157,878
Total	*235,223*	*773,014*	*891,134*	*1,899,371*
Emissions with Environmental Commitments and State Mandates				
2016	4,958	19,012	99,015	122,985
2017	13,280	49,429	99,015	161,723
2018	23,976	84,547	99,015	207,538
2019	55,484	107,089	99,015	261,588
2020	34,402	111,316	99,015	244,733
2021	21,647	111,997	99,015	232,659
2022	14,109	84,182	99,015	197,306
2023	10,014	29,926	99,015	138,954
2024	45,491	6,394	99,015	150,900
Total	*223,360*	*603,892*	*891,134*	*1,718,386*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-96).

Values may not total correctly due to rounding.

Table 22-95 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-95 are therefore provided for information purposes only.

Table 22-95. GHG Emissions from Construction of Alternative 4 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	125,962	222,784	348,745
SMAQMD	58,067	668,351	726,418
SJVACD	51,194	0	51,194
Emissions with Environmental Commitments and State Mandates			
BAAQMD	116,179	222,784	338,963
SMAQMD	56,072	668,351	724,422
SJVACD	51,110	0	51,110

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-96).

Construction of Alternative 4 would generate a total of 1.7 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding approximately 344,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion**:** Construction of Alternative 4 would generate a total of 1.7 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

BDCP proponents will develop a GHG Mitigation Program prior to the commencement of any construction or other physical activities associated with CM1 that would generate GHG emissions. The GHG Mitigation Program will consist of feasible options that, taken together, will reduce construction-related GHG emissions to net zero (0) (i.e., emissions will be reduced to the maximum extent feasible and any remaining emissions from the project will be offset elsewhere by emissions reductions of equal amount). The BDCP proponents will determine the nature and form of the components of the GHG Mitigation Program after consultation with the following agencies, as applicable: (i) Study area air districts (BAAQMD, SMAQMD, SJVPACD, and YSAQMD), (ii) California Air Resources Board, (iii) U.S. Environmental Protection Agency, and (iv) California Energy Commission.

Specific strategies that could be used in formulating the GHG Mitigation Program are summarized below. The identified strategies will produce GHG reductions across a broad range of emissions sectors throughout the state. The strategies are divided into seven categories based on their application. Potential GHG emissions reductions that could be achieved by each measure are identified. It is theoretically possible that many of the strategies discussed below could independently achieve a net-zero GHG footprint for BDCP construction activities. Various combinations of measure strategies could also be pursued to optimize total costs or community co-benefits. The BDCP proponents shall be responsible for determining the overall mix of strategies necessary to ensure the performance standard to mitigate the adverse GHG construction impacts is met.

BDCP proponents will develop a mechanism for quantifying, funding, implementing, and verifying emissions reductions associated with the selected strategies. BDCP proponents will also conduct annual reporting to verify and document that selected strategies achieve sufficient emissions reductions to offset construction-related emissions to net zero. All selected strategies must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits or other mitigation strategies). Annual reports will include, at a minimum the following components.

- Calculated or measured emissions from construction activities over the reporting year.
- Projects selected for funding during the reporting year.
- Total funds distributed to selected projects during the reporting year.
- Cumulative funds distributed since program inception.
- Emissions reductions achieved during the reporting year.
- Cumulative reductions since program inception.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-15.

GHG Emissions Reduction Strategies to Consider in Formulating a GHG Mitigation Program

This section summarizes GHG reduction strategies that will be considered in formulating a GHG mitigation program. Quantitative information on the potential capacity of each strategy is provided. These estimates are based on general construction activity information, the size and trading volume of existing carbon offset markets, and available alternative energy resources (e.g., biomass, renewable energy) available to the project as potential mitigation strategies. Emissions reductions quantified for each strategy should be seen as high-level screening values that illustrate a rough order of magnitude for the expected level of emissions reductions or offsets. Moreover, the mitigation strategies should be viewed not as individual strategies, but rather as a suite of strategies. If one strategy, when investigated in greater detail prior to implementation, cannot deliver as high a level of emissions reduction or offset as initially estimated, other strategies will be implemented to ensure achievement of the performance standard of zero net GHG emissions from the project.

Renewable Energy Purchase Agreement

- **Strategy-1: Renewable Energy Purchase Agreement:** Enter into a power purchase agreement, where feasible, with utilities which provide electricity service within the Study area to purchase construction electricity from renewable sources. Renewable sources must be zero emissions energy sources (e.g., wind, solar, hydro) and may not be accounted to utility RPS goals. Sufficient renewable resources already exist within the state (currently 30,005 gigawatt-hours per year) to offset 100% of emissions generated by construction electricity for all BDCP alternatives (2,549 gigawatt-hours over a nine-year construction period) and additional renewable energy resources are expected to be brought online prior to commencement of construction activities.

Additional Onsite Mitigation

- **Strategy-2: Engine Electrification**: DWR has identified all feasible electrification requirements as environmental commitments. It is anticipated that additional technology will be available by the time construction starts that will enable further electrification. This strategy would take advantage of new technologies as they become available and will engage the maximum level of engine electrification feasible for onsite heavy-duty equipment. Depending on the number of equipment pieces electrified, maximum emissions reductions achieved by this strategy for Alternative 4 over the nine-year construction period are estimated at approximately 61,000 MT CO_2e.[49]
- **Strategy-3: Low Carbon Concrete**: Require concrete components to be constructed out of concrete with up to 70% replacement of cement with SCM with lower embodied energy and associated GHG emissions.[50] Implementation of this strategy would require structural testing to ensure the concrete meet required strategy strength, durability, workability, and rigidity standards. If new materials with lower embodied energy or superior workability are developed between the writing of this measure and project commencement, the BDCP proponents will investigate use of those materials in place of SCM. Depending on the volume of concrete replaced, maximum emissions reductions achieved by this strategy for Alternative 4 over a nine-year construction period are estimated at approximately 260,657 MT CO_2e.
- **Strategy-4: Renewable Diesel and/or Bio-diesel:** Require use of renewable diesel sometimes also called "green diesel" and or bio-diesel fuels for operation of all diesel equipment. If new technologies or fuels with lower emissions rates are developed between the writing of this measure and project commencement, those advanced technologies or fuels could be incorporated into this measure. Depending on the number of equipment pieces retrofitted, maximum emissions reductions achieved by this strategy for Alternative 4 over the nine-year construction period are estimated at approximately 33,000 MT CO_2e.

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[49] Value assumes equipment categories currently identified for electrification through environmental commitments (see Appendix 22A, *Air Quality Analysis Assumptions*) will be maximized so that all equipment pieces in those categories will be electric.

[50] SCM are often incorporated in concrete mix to reduce cement contents, improve workability, increase strength, and enhance durability. Although SCM can improve the strength of resulting structures, proper testing is required ensure the cement meets technical specifications for strength and rigidity.

Energy Efficiency Retrofits and Rooftop Renewable Energy

- **Strategy-5: Residential Energy Efficiency Improvements**: Develop a residential energy retrofit package in conjunction with local utility providers to achieve reductions in natural gas and electricity usage. The retrofit package should include, at a minimum, the following improvements.
  - Replacement of interior high use incandescent lamps with CFLs or LED.
  - Installation of programmable thermostats.
  - Replacement of windows with double-pane or triple-pane solar-control low-E argon gas filled wood frame windows.
  - Identification and sealing of dust and air leaks.
  - Replacement of electric clothes dryers with natural gas dryers.
  - Replacement of natural gas furnaces with Energy Star labeled models.
  - Installation of insulation.

  This measure is inherently scalable (i.e., the total number of houses retrofit is likely limited by funds rather than the availability of housing stock). There are 1.4 million homes (2008 est.) within the socioeconomic study area (i.e., Delta Study area). The potential capacity for residential retrofits is therefore around 700,000 retrofits (assuming half the homes are already retrofitted or cannot be retrofitted). Assuming the above retrofit achieves a 1,486 MT CO_2e reduction per package per year (U.S. Department of Energy 2012), there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

- **Strategy-6: Commercial Energy Efficiency Improvements**: Develop a commercial energy retrocommissioning package in conjunction with local utility providers to improve building-wide energy efficiency by at least 15%, relative to current energy consumption levels. This measure is inherently scalable. Assuming each retrofit achieves a 15% reduction in building energy use, there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

- **Strategy-7: Residential Rooftop Solar**: Develop a residential rooftop solar installation program in conjunction with local utility providers. The installation program will allow homeowners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable. Based on the average annual electricity generation of a residential solar system in the Central Valley, there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

- **Strategy-8: Commercial Rooftop Solar**: Develop a commercial rooftop solar installation program in conjunction with local utility providers. The installation program will allow business owners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable. Based on the average annual electricity generation of a commercial solar system in the Central Valley, there are sufficient resources within the Study area to offset 100% of emissions generated by construction of all BDCP alternatives.

Carbon Offsets

- **Strategy-9: Purchase Carbon Offsets**: In partnership with offset providers, purchase carbon offsets. Offset protocols and validation could tier off existing standards (e.g., Climate Registry Programs) or could be developed independently, provided such protocols satisfy basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). ARB has established a Cap and Trade registry that identifies qualified providers and AB 32 projects. It is estimated that between 2012 and 2020, 2.5 billion allowances will be made available within the state (Legislative Analyst's Office 2012). The national and international carbon markets are likely greater. Potential offset programs could include the following.
  - AB 32 U.S. Forest and Urban Forest Project Resources
  - AB 32 Livestock Projects
  - AB 32 Ozone Depleting Substances Projects
  - AB 32 Urban Forest Projects
  - Other-California Based Offsets
  - United States Based Offsets
  - International Offsets (e.g., clean development mechanisms)

  This measure is inherently scalable based on the volume of offsets purchased and could potentially offset 100% of emissions from construction activities.

Biomass Digestion and Conversion

- **Strategy-10: Development of Biomass Waste Digestion and Conversion Facilities**: Provide financing for facility development either through long term power purchase agreements or up front project financing. Projects will be awarded based on competitive bidding process and chosen for GHG sequestration and other environmental benefits to project area. Projects will provide a range of final products: electricity generation, Compressed Natural Gas for transportation fuels, and pipeline quality biomethane. Based on the number and size of dairies and biomass resources within the Study area, there are sufficient resources to offset 100% of construction emissions for all BDCP alternatives.
- **Strategy-11: Agriculture Waste Conversion Development:** Fund the re-commissioning of thermal chemical conversion facilities to process collected agricultural biomass residues**.** Project funding will include better resource modeling and provide incentives to farmers in the project area to deliver agricultural wastes to existing facilities. There are sufficient biomass resources within the Study area (13.6 million bone dry tons/year) to offset 100% of emissions generated by construction of all BDCP alternatives.

Increase Renewable Energy Purchases to Operate the State Water Project

- **Strategy-12: Temporarily Increase Renewable Energy Purchases for Operations**: Temporarily increase renewable energy purchases under the Renewable Energy Procurement Plan to offset BDCP construction emissions. DWR as part of its CAP is implementing a Renewable Energy Procurement Plan. This plan identifies the quantity of additional renewable electricity resources that DWR will purchase in each year between 2010 and 2050 to achieve the GHG emissions reduction goals laid out in the CAP. During the expected BDCP construction period for Alternative 4 (2016–2022), DWR estimates that it would need to purchase 280 to 600[51] additional gigawatt-hours (GWh) of renewable electricity for each of the nine years of construction, or for years following construction (3,500 GWh total) to offset the entire quantity of GHG emissions emitted by construction of Alternative 4. (The additional renewable electricity purchases would offset emissions from construction activities. Maximum emissions reductions achieved by this strategy over the nine-year construction period could potentially offset 100% of emissions from construction activities.

Land Use Change and Sequestration

- **Strategy-13: Tidal Wetland Inundation**: Expand the number of subsidence reversal and/or carbon sequestration projects currently being undertaken by DWR on Sherman and Twitchell Islands. Existing research at the Twitchell Wetlands Research Facility demonstrates that wetland restoration can sequester 25 tons of carbon per acre per year. Measure funding could be used to finance permanent wetlands for waterfowl or rice cultivation, creating co-benefits for wildlife and local farmers. Given the variability associated with land use change and GHG flux, maximum emissions reductions associated with this strategy are currently unknown.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 4 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-96).

Table 22-96 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-96 are therefore representative of project impacts for both the NEPA and CEQA analysis.

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[51] The State Water Project uses a portfolio of electricity resources to meet its electricity needs for water pumping including hydropower generation at its facilities, contracts for power from other generators, and market purchases from the California Independent System Operator (CAISO) grid. Additional renewable energy purchases under Strategy 12 would result in reduced purchases from the CAISO grid. DWR uses the California Air Resources Board emissions factor (437 metric tons CO_2e/GWh) for unspecified power purchases to calculate emissions from CAISO grid market purchases.

Table 22-96. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 4 (Scenarios H1 through H4) (metric tons/year)

Emissions without State Targets

Year	Equipment CO_2e	Concrete Absorption (CO_2)[a]	CEQA Baseline (Electricity CO_2e)				NEPA Point of Comparison (Electricity CO_2e)				CEQA Baseline (Total CO_2e)				NEPA Point of Comparison (Total CO_2e)			
			H1	H2	H3	H4	H1	H2	H3	H4	H1	H2	H3	H4	H1	H2	H3	H4
2025 Conditions	161	0	256,551	-16,679	106,744	-154,052	-	-	-	-	256,711	-16,518	106,905	-153,891	-	-	-	-
2060 Conditions	161	-37,428	99,466	-154,658	-42,758	-289,605	419,093	164,969	276,868	30,022	62,200	-191,925	-80,025	-326,872	381,826	127,702	239,602	-7,245

Emissions with State Targets

Year	Equipment CO_2e	Concrete Absorption (CO_2)[a]	CEQA Baseline (Electricity CO_2e)				NEPA Point of Comparison (Electricity CO_2e)				CEQA Baseline (Total CO_2e)				NEPA Point of Comparison (Total CO_2e)			
			H1	H2	H3	H4	H1	H2	H3	H4	H1	H2	H3	H4	H1	H2	H3	H4
2025 Conditions	137	0	196,002	-12,742	81,552	-117,694	-	-	-	-	196,139	-12,606	81,688	-117,557	-	-	-	-
2060 Conditions	136	-37,428	75,991	-118,157	-32,667	-221,255	320,183	126,034	211,524	22,936	38,699	-155,449	-69,959	-258,547	282,890	88,742	174,232	-14,356

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 4 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-97 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD) under Scenarios H1 through H4. The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-97 are therefore provided for information purposes only.

Table 22-97. Total CO_2e Emissions from Operation and Maintenance of Alternative 4 (Scenarios H1 through H4) by Air District (metric tons/year)

Year	Emissions without State Mandates	Emissions with State Mandates
Early Late (2025)		
SMAQMD	126	104
SJVAPCD	32	30
BAAQMD	3	3
Late-Long Term (2060)		
SMAQMD	126	102
SJVAPCD	32	30
BAAQMD	3	3

[a] Emissions do not include emissions generated by increased electricity usage.

SWP Operational and Maintenance GHG Emissions Analysis

SWP operational emissions with implementation of Alternative 4 would vary depending on the outcome of the decision tree process. Because Scenario H1 represents the largest potential increase in SWP electricity demand (of the four possible outcomes) this analysis evaluates Scenario H1. Note that Scenario H4 would result in a decrease in SWP electricity demand, and thus would result in no impact or a positive impact on SWP operational GHG emissions.

Alternative 4 would add a maximum of 1,405 GWh[52] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,405 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 4 including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-17 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 4. As shown in Figure 22-17, in 2024, the year BDCP Alternative 4 is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to around 1.5 million metric tons of CO_2e. This elevated level is approximately 260,000 metric tons of CO_2e above

[52] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2041 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 4 is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 4 would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-98 below shows how the REPP could be modified to accommodate BDCP Alternative 4, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,405 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,393 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-18 shows how this modified REPP would affect DWR's projected future emissions with BDCP Alternative 4.

Table 22-98. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 4)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	222
2026–2030	72	72
2031–2040	108	53
2041–2050	144	74
Total Cumulative	52,236	57,011

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 4 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 4 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 4 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 4 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 4 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 4, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 4, however, could result in an increase of up to 159[53] GWh in the demand for CVP generated electricity, which would result in a reduction of 159 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

[53] SWP operational emissions with implementation of Alternative 4 would vary depending on the outcome of the decision tree process. Because Scenario H1 represents the largest potential decrease in excess generating capacity for the CVP (of the four possible outcomes) this analysis evaluates Scenario H1. Note that Scenario H4 would result in an increase in excess CVP generating capacity, and thus would result in no impact or a positive impact on statewide GHG emissions.

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (159 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions* for additional detail on quantification methods).

Substitution of 159 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 48,082 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 36,681 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 4 would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 4 would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Implementation of the Conservation Measures 2–11 could generate additional traffic on roads and highways in and around Suisun Marsh and the Yolo Bypass related to restoration or monitoring activities. Habitat restoration and enhancement activities that require physical changes or heavy-duty equipment would generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. Habitat restoration and enhancement conservation measures are anticipated to include a number of activities generating traffic to transport material and workers to and from the construction sites, including the following.

- Grading, excavating, and placing fill material.
- Breaching, modifying, or removing existing levees and constructing new levees.
- Modifying, demolishing, and removing existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).
- Constructing new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).

Operational emissions associated with Conservation Measures 2–11 would primarily result from vehicle trips for site inspections, monitoring, and routine maintenance. The intensity and frequency of vehicle trips associated with routine maintenance are assumed to be relatively minor. Because the specific areas and process for implementing CM2–CM11 has not been determined, this effect is evaluated qualitatively.

Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. Activities with the greatest potential to have short or long-term air quality effects are denoted with an asterisk (*).

CM2–CM11 restoration activities would occur in all air districts. Construction and operational emissions associated with the restoration and enhancement actions under Alternative 4 could potentially exceed applicable general conformity *de minimis* levels listed in Table 22-8 and applicable local thresholds listed in Table 22-9. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

BDCP proponents will shall develop an AQMP prior to the commencement of any construction, operational, or other physical activities associated with CM2–CM11 that would involve adverse effects to air quality. The AQMP will be incorporated into the site-specific environmental review for all conservation measures or project activities. BDCP proponents will ensure that the following measures are implemented to reduce local and regional air quality impacts. Not all measures listed below may be feasible or applicable to each conservation measure. Rather, these measures serve as an overlying mitigation framework to be used for specific conservation measures. The applicability of measures listed below may also vary based on the lead agency, location, timing, available technology, and nature of each conservation measure.

- Implement basic and enhanced dust control measures recommended by local air districts in the project-area. Applicable control measures may include, but are not limited to, watering exposed surfaces, suspended project activities during high winds, and planting vegetation cover in disturbed areas.
- Require construction equipment be kept in proper working condition according to manufacturer's specifications.
- Ensure emissions from all off-road diesel-powered equipment used to construct the project do not exceed applicable air district rules and regulations (e.g., nuisance rules, opacity restrictions).
- Reduce idling time by either shutting equipment off when not in use or limiting the time of idling to less than required by the current statewide idling restriction.
- Reduce criteria pollutant exhaust emissions by requiring the latest emissions control technologies. Applicable control measures may include, but are not limited to, engine retrofits, alternative fuels, electrification, and add-on technologies (e.g., DPF).
- As feasible, require a minimum buffer distance of 1,000 feet from sensitive receptors for diesel equipment.

Implementation of this measure will reduce criteria pollutant emissions generated by construction, operational, or other physical activities associated with CM2–CM11. The applicability of measures listed above may vary based on the lead agency, location, timing, available technology, and nature of each conservation measure. If the above measures do not contribute to emissions reductions, guidelines will be developed to ensure that criteria pollutants generated during construction and project operations are reduced to the maximum extent practicable.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 4 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion: The restoration and enhancement actions under Alternative 4 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact is would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

BDCP proponents will prepare a land use sequestration analysis to evaluate GHG flux associated with implementation of CM2–CM11. The land use analysis will evaluate the one-time carbon storage loss associated with vegetation removal, soil carbon content, and existing and future with project GHG flux. In the event that the land use analysis demonstrates a net positive GHG flux, feasible strategies to reduce GHG emissions will be undertaken. To the extent feasible, mitigation shall require project design changes so that land uses that serve as carbon sinks (i.e., result in net decreases in carbon) are not replaced with other uses that are sources (i.e., result in net increases in carbon) of GHG emissions.

22.3.3.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)

One intake would be constructed under Alternative 5. For the purposes of this analysis, it was assumed that Intake 1 (on the east bank of the Sacramento River), an intermediate forebay, and a buried pipeline and tunnel conveyance would be constructed under Alternative 5 (Figures 3-2 and 3-12 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 5 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 5 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-99, are therefore provided for informational purposes only and are not included in the impact conclusion. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-99 Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 5 (tons/year)[a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	1	0	0	3
2017	-	0	0	2	0	0	4
2018	-	0	0	5	0	0	9
2019	-	0	1	22	1	1	41
2020	-	0	2	33	2	2	60
2021	-	0	2	38	3	3	69
2022	-	0	1	24	2	2	44
2023	-	0	0	8	1	1	15
2024	-	0	0	8	1	1	15
2025	CEQA	0	2	27	2	2	50
2060	NEPA	1	7	114	8	8	210
2060	CEQA	-1	-5	-88	-6	-6	-162

NEPA = Compares criteria pollutant emissions after implementation of Alternative 5 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 5 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-100 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

1 **Table 22-100. Criteria Pollutant Emissions from Construction of Alternative 5 (pounds/day and tons/year)**

Maximum Daily Emissions (pounds/day)

Year	ROG	NO_X	CO	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	SO_2
Bay Area Air Quality Management District										
2016	1	7	5	0	0	0	0	0	0	0
2017	26	195	110	5	2	7	1	2	3	1
2018	15	112	73	5	1	7	1	1	2	1
2019	77	509	338	5	4	9	1	4	5	2
2020	46	285	213	5	2	8	1	2	3	2
2021	8	42	36	5	0	6	1	0	1	0
2022	7	36	32	5	0	5	1	0	1	0
2023	0	0	0	0	0	0	0	0	0	0
2024	90	421	470	5	2	8	1	2	3	2
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-
Sacramento Metropolitan Air Quality Management District										
2016	42	320	165	0	3	3	0	3	3	2
2017	125	898	495	33	6	39	5	6	11	3
2018	156	1,077	645	33	7	40	5	7	12	3
2019	106	710	452	33	4	37	5	4	9	2
2020	50	307	265	33	2	35	5	2	7	1
2021	26	135	129	33	1	34	5	1	6	0
2022	28	142	135	33	1	33	5	1	6	0
2023	16	85	86	4	1	5	4	1	4	0
2024	0	1	1	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-
San Joaquin Valley Air Pollution Control District										
2016	28	208	101	0	1	1	0	1	1	0
2017	26	187	98	22	1	23	3	1	4	0
2018	26	191	123	22	2	24	3	2	5	1
2019	33	210	161	22	2	24	3	2	5	2
2020	31	182	154	22	2	24	3	2	5	2
2021	25	140	130	22	2	24	3	2	5	1
2022	23	128	127	22	1	24	3	1	5	1
2023	11	62	56	3	0	4	3	0	4	0
2024	11	57	55	3	0	4	3	0	4	0
Thresholds	-	-	-	-	-	-	-	-	-	-

Annual Emissions (tons/year)

Year	ROG	NO_X	CO	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	SO_2
Bay Area Air Quality Management District										
2016	0	0	0	0	0	0	0	0	0	0
2017	2	17	10	0	0	0	0	0	0	0
2018	2	17	11	0	0	0	0	0	0	0
2019	7	47	32	0	0	0	0	0	0	0
2020	5	30	22	0	0	0	0	0	0	0
2021	1	8	6	0	0	0	0	0	0	0
2022	0	1	1	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	2	8	10	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-
Sacramento Metropolitan Air Quality Management District										
2016	3	22	11	0	0	0	0	0	0	0
2017	8	61	35	2	0	3	0	0	1	0
2018	14	98	58	2	1	3	0	1	1	0
2019	9	59	40	2	0	2	0	0	1	0
2020	6	34	27	2	0	2	0	0	1	0
2021	3	15	15	2	0	2	0	0	0	0
2022	3	15	14	2	0	2	0	0	0	0
2023	0	2	2	2	0	2	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-
San Joaquin Valley Air Pollution Control District										
2016	1	6	3	0	0	0	0	0	0	0
2017	1	10	5	2	0	2	0	0	0	0
2018	2	17	11	2	0	2	0	0	0	0
2019	4	23	18	2	0	2	0	0	1	0
2020	5	30	26	2	0	2	0	0	1	0
2021	4	25	23	2	0	2	0	0	1	0
2022	3	18	18	2	0	2	0	0	0	0
2023	2	9	9	2	0	2	0	0	0	0
2024	0	2	2	2	0	2	0	0	0	0
Thresholds	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 5 would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-101 summarizes criteria pollutant emissions associated with operation of Alternative 5 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-101. Criteria Pollutant Emissions from Operation of Alternative 5 (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.09	0.80	0.72	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.08	0.77	0.63	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Thresholds	*54*	*54*	*-*	*82*	*82*	*-*	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.12	1.11	1.04	0.04	0.04	0.01	0.00	0.02	0.04	0.00	0.00	0.00
2060	0.12	1.08	0.94	0.04	0.04	0.01	0.00	0.02	0.03	0.00	0.00	0.00
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.09	0.79	0.65	0.03	0.03	0.01	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.08	0.76	0.59	0.03	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 5 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 5 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-100, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 would exceed the district's concentration-based threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including all intake and intake pumping plant sites and the intermediate forebay site, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5) would exceed the district's threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; the use of CNG, tier 4 engines, and DPFs; and BMPs including proper engine maintenance and idling restrictions (see Appendix 3B, *Environmental Commitments*). These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-100, emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[54] Accordingly, this would be an adverse effect.

[54] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-100, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019 and 2024
- NO_X: 2017 through 2020 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-100, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-100, construction emissions would exceed SJVAPCD's annual NO_X threshold in 2018 and 2022, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-100, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 5 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 5 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-101, operation and maintenance activities under Alternative 5 would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-101, operation and maintenance activities under Alternative 5 would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SJVPACD are expected at construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As shown in Table 22-101, operation and maintenance activities under Alternative 5 would not exceed SJVAPCD's thresholds of significance (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 5 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-102. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-102. Criteria Pollutant Emissions from Construction and Operation of Alternative 5 in the SFNA, SJVAPCD, and SFBAAB (tons/year)

Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
Sacramento Federal Nonattainment Area						
2016	3	22	11	0	0	0
2017	8	<u>61</u>	35	3	1	0
2018	14	<u>98</u>	58	3	1	0
2019	9	<u>59</u>	40	2	1	0
2020	6	<u>34</u>	27	2	1	0
2021	3	15	15	2	0	0
2022	3	15	14	2	0	0
2023	0	2	2	2	0	0
2024	0	0	0	0	0	0
2025	0.00	0.02	0.04	0.00	0.00	0.00
2060	0.00	0.02	0.03	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
San Joaquin Valley Air Basin						
2016	1	6	3	0	0	0
2017	1	10	5	2	0	0
2018	2	<u>17</u>	11	2	0	0
2019	4	<u>23</u>	18	2	1	0
2020	5	<u>30</u>	26	2	1	0
2021	4	<u>25</u>	23	2	1	0
2022	3	<u>18</u>	18	2	0	0
2023	2	9	9	2	0	0
2024	0	2	2	2	0	0
2025	0.00	0.01	0.01	0.00	0.00	0.00
2060	0.00	0.01	0.00	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*
San Francisco Bay Area Air Basin						
2016	0	0	0	0	0	0
2017	2	17	10	0	0	0
2018	2	17	11	0	0	0
2019	7	47	32	0	0	0
2020	5	30	22	0	0	0
2021	1	8	6	0	0	0
2022	0	1	1	0	0	0
2023	0	0	0	0	0	0
2024	2	8	10	0	0	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	*-*	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-102, implementation of Alternative 5 would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2017 and 2020. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SVAB ozone SIP for each year of construction between 2017 and 2020.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-102, implementation of Alternative 5 would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2018 and 2022. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2018 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which requires additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-102, implementation of the Alternative 5 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*, this impact would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources

of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-100, construction of Alternative 5 would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 5 would be similar to Alternative 1A. As shown in Table 22-15, Alternative 5 would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 5 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-100, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion*

Modeling and Health Risk Assessment for Construction Emissions, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions, non-cancer hazards and cancer risks associated with Alternative 5 would be similar to Alternative 1A. As shown in Table 22-16, Alternative 5 would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 5 construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-100, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 5 would be similar to Alternative 1A. As shown in Table 22-17, Alternative 5 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-100). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 5 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-100, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 5 would be similar to Alternative 1A. As shown in Table 22-18, Alternative 5 would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 5 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 5 would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

***CEQA Conclusion*:** Alternative 5 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 5 are summarized in Table 22-103. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-104 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-103). GHG emissions presented in Table 22-104 are therefore provided for information purposes only.

1 **Table 22-103. GHG Emissions from Construction of Alternative 5 (metric tons/year)[a]**

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[b]	Total CO_2e
Emissions with Environmental Commitments				
2016	4,646	2,066	36,486	43,199
2017	16,354	3,241	36,486	56,080
2018	26,591	7,223	36,486	70,300
2019	29,493	34,093	36,486	100,072
2020	24,828	51,642	36,486	112,957
2021	14,725	59,721	36,486	110,932
2022	10,643	37,533	36,486	84,662
2023	3,189	12,910	36,486	52,586
2024	4,243	12,910	36,486	53,639
Total	*134,711*	*221,340*	*328,377*	*684,428*
Emissions with Environmental Commitments and State Mandates				
2016	4,473	1,758	36,486	42,717
2017	15,481	2,687	36,486	54,654
2018	24,735	5,832	36,486	67,053
2019	26,933	26,786	36,486	90,205
2020	22,109	39,454	36,486	98,049
2021	13,091	45,626	36,486	95,204
2022	9,482	28,675	36,486	74,643
2023	2,845	9,863	36,486	49,195
2024	3,781	9,863	36,486	50,131
Total	*122,929*	*170,544*	*328,377*	*621,850*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-105).

Values may not total correctly due to rounding.

2

Table 22-104. GHG Emissions from Construction of Alternative 5 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	31,297	65,675	96,972
SMAQMD	66,731	197,026	263,757
SJVACD	36,684	65,675	102,359
Emissions with Environmental Commitments and State Mandates			
BAAQMD	28,519	65,675	94,194
SMAQMD	61,316	197,026	258,342
SJVACD	33,095	65,675	98,770

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-105).

Construction of Alternative 5 would generate a total of 621,850 metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding approximately 124,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 5 would generate a total of 621,850 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 5 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-105).

Table 22-105 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-104 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-105. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 5 (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e} NEPA Point of Comparison	Electricity CO_{2e} CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
Emissions without State Targets						
2025 Conditions	31	-	43,365	0	-	43,396
2060 Conditions	31	180,435	-139,192	-13,792	166,674	-152,953
Emissions with State Targets						
2025 Conditions	25	-	33,130	0	-	33,155
2060 Conditions	25	137,850	-106,341	-13,792	124,083	-120,109

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 5 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-106 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-106 are therefore provided for information purposes only.

Table 22-106. Total CO_2e Emissions from Operation and Maintenance of Alternative 5 by Air District (metric tons/year)

Year	Emissions without State Mandates	Emissions with State Mandates
Early Late (2025)		
SMAQMD	25	19
SJVAPCD	6	5
BAAQMD	1	1
Late-Long Term (2060)		
SMAQMD	25	19
SJVAPCD	6	5
BAAQMD	1	1

[a] Emissions do not include emissions generated by increased electricity usage.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 5 would add approximately 622 GWh[55] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 622 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 5 including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-19 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 5. As shown in Figure 22-19, in 2024, the year BDCP Alternative 5 is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to around 1.2 million metric tons of CO_2e. This elevated level is still approximately 80,000 metric tons of CO_2e below DWR's designated GHG emissions reduction trajectory (red-line which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates even with the additional electricity required to operate BDCP Alternative 5, existing GHG emissions reduction measures would ensure that DWR's GHG emissions would not exceed the GHG emissions reduction trajectory and that the existing GHG emissions reduction measures would be sufficient to ensure that DWR meets is 2050 emissions reduction goal. The accommodation of over 600 additional GWh of electricity annually, without the need for additional GHG emissions reductions is possible because DWR intentionally designed its strategies in the CAP to allow for some load growth.

[55] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

NEPA Effects: As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 5 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 5 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 5 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 5 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 5 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 5, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 5, however, would result in an increase of 64 GWh in the demand for CVP generated electricity, which would result in a reduction of 64 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (64 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail on quantification methods).

Substitution of 64 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 19,354 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 14,765 metric tons of CO_2e.

The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Increased electricity demand resulting from pumping at CVP facilities associated with operation of Alternative 5 would be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over the No Action Alterative therefore there would be no effect on CVP operations.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 5 would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

CEQA Conclusion: Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 5 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 5 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.11 Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)

A total of five intakes would be constructed under Alternative 6A. For the purposes of this analysis, it was assumed that Intakes 1–5 (on the east bank of the Sacramento River) would be constructed under Alternative 6A. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-13 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 6A would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 6A electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Construction emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. Refer to Table 22-11 for a summary of criteria pollutants during construction (years 2016 through 2024) of Alternative 1A that are applicable to this alternative. Operational emissions would be different from Alternative 1A and are provided in Table 22-107. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-107. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 6A (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	-1	-13	-231	-15	-15	-425
2060	NEPA	-1	-7	-116	-8	-8	-212
2060	CEQA	-2	-18	-318	-21	-21	-584

NEPA = Compares criteria pollutant emissions after implementation of Alternative 6A to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 6A to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 6A would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 6A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments. Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's concentration-based threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. See the discussion of Impact AQ-2 under Alternative 1A.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in

Table 22-12, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[56] Accordingly, this would be an adverse effect.

CEQA Conclusion**:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

[56] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019, 2020, and 2024
- NO_X: 2017 through 2022 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

CEQA Conclusion**:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed SJVAPCD's NO_X threshold for all years between 2017 and 2023, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 6A would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 6A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-13, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-13, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-13, emissions would not exceed SJVAPCD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. Please see the discussion of Impact AQ-9 under Alternative 1A.

Sacramento Federal Nonattainment Area

As shown in Table 22-14, implementation of Alternative 6A would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2016 and 2022. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-14, implementation of Alternative 6A would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de* *minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which requires additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-14, implementation of the Alternative 6A would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*), this impact would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-12, construction of Alternative 6A would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 6A would be similar to Alternative 1A. As shown in Table 22-15, Alternative 6A would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 6A construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-12, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 6A would be similar to Alternative 1A. As shown in Table 22-16, Alternative 6A would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 6A construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-12, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta*

Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions, non-cancer hazards and cancer risks associated with Alternative 6A would be similar to Alternative 1A. As shown in Table 22-17, Alternative 6A would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-12). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 6A construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-12, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 6A would be similar to Alternative 1A. As shown in Table 22-18, Alternative 6A would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant

concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 6A construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 6A would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 6A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 6A would generate a total of 1.4 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 6A would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-108).

Table 22-108 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-108 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-108. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 6A (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e} NEPA Point of Comparison	Electricity CO_{2e} CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
Emissions without State Targets						
2025 Conditions	268	-	-364,811	0	-	-364,543
2060 Conditions	268	-182,557	-502,184	-37,368	-219,654	-539,284
Emissions with State Targets						
2025 Conditions	228	-	-278,712	0	-	-278,484
2060 Conditions	226	-139,472	-383,663	-37,368	-176,614	-420,805

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 6A to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-22 (Alterative 1A) is representative of GHG emissions that would be generated in each air district under Alternative 6A.

Table 22-22 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-22 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 6A would not add any[57] additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions would be emitted as a result of the maintenance of new facilities associated with Alternative 6A (Table 22-108). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

NEPA Effects: Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 6A would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 6A would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 6A is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 6A would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 6A with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

[57] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 6A, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 6A is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 6A would reduce GHG emissions by 19,610 to 25,704 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Implementation of Alternative 6A is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 6A would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 6A could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.12 Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)

A total of five intakes would be constructed under Alternative 6B. For the purposes of this analysis, it was assumed that Intakes 1–5 (on the east bank of the Sacramento River) would be constructed under Alternative 6B. Under this alternative, an intermediate pumping plant would also be constructed, and the conveyance facility would be a canal (Figures 3-4 and 3-14 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 6B would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 6B electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Construction emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. Refer to Table 22-20 for a summary of criteria pollutants during construction (years 2014 through 2022) of Alternative 1B that are applicable to this alternative. Operational emissions would be different from Alternative 1B and are provided in Table 22-109. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-109. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 6B (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	-2	-16	-270	-18	-18	-497
2060	NEPA	-1	-9	-150	-10	-10	-275
2060	CEQA	-2	-20	-352	-23	-23	-647

NEPA = Compares criteria pollutant emissions after implementation of Alternative 6B to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 6B to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 6B would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 6B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-26, emissions would exceed SMAQMD's daily NO_X threshold for all years between 2014 and 2019, even with implementation of environmental commitments. Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's concentration-based threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River. See the discussion of Impact AQ-2 under Alternative 1B.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-26, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[58] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which

[58] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-26, emissions would exceed BAAQMD's daily NO_X thresholds for all years between 2015 and 2021, even after implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect. While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the BAAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay. See the discussion of Impact AQ-3 under Alternative 1B.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-26, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

CEQA Conclusion**:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-26, emissions would exceed SJVAPCD's annual thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2015 through 2019
- NO_X: 2014 through 2020
- PM10: 2016

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the SJVAPCD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the east conveyance alignment. PM10 emissions are expected to be greatest within the immediate vicinity of the concrete batching plants. For a map of the proposed east alignment, see Mapbook Figure M3-2.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-9. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the

CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 6B would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 6B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-27, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-27, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-27, emissions would not exceed SJVAPCD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. Please see the discussion of Impact AQ-9 under Alternative 1B.

Sacramento Federal Nonattainment Area

As shown in Table 22-28, implementation of Alternative 6B would exceed SFNA federal *de minimis* threshold for NO_X for all years between 2015 and 2018. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-28, implementation of Alternative 6B would exceed SJVAB federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2015 through 2019
- CO: 2014 through 2020
- NO_X: 2015 through 2018

ROG and NO_X are precursors to ozone, for which the SJVAB is in nonattainment for the NAAQS. Likewise, the SJVAB is current classified as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SJVAB ozone and CO SIPs for each year of construction for which the *de minimis* thresholds are exceed.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional ROG or NO_X as construction-related ROG and NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or contributions to the SJVAPCD's VERA. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SJVAB federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. In the event that Alternative 1B is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for CO through a local air quality modeling analysis (i.e., dispersion modeling) to ensure project emissions do not cause or contribute to any new violation of the CO NAAQS or increase the frequency or severity of any existing violation of the CO NAAQS.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-28, implementation of the Alternative 6B would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional ozone in the SFNA and SJVAB. These measures would therefore ensure total direct and indirect ozone emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Accordingly, a positive conformity determination has been made for emissions within the SMAQMD, SJVAB (ROG and NO_X only), SFBAAB (see Appendix 22E, *Conformity Letters*). This impact would be less than significant with mitigation.

General conformity cannot be satisfied for CO through the purchase of offsets within the SJVAB. Accordingly, this impact would be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Although this alternative would not generate DPM emissions within the YSAQMD, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 2B. Therefore, the health threats generated by Alternative 2B would be representative of emissions generated by Alternative 6B. The health threats generated by construction of Alternative 6B in the YSAQMD would equal the estimates shown in Table 22-61.

Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6B would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-61) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** The DPM generated during Alternative 6B construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 2B. Therefore, the health threats generated by Alternative 2B would be representative of emissions generated by Alternative 6B. The health threats generated by construction of Alternative 6B in the SMAQMD would equal the estimates shown in Table 22-62.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6B would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-62) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** The health threats resulting from DPM generated by Alternative 6B would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 2B. Therefore, the health threats generated by Alternative 2B would be representative of emissions generated by Alternative 6B. The health threats generated by construction of Alternative 6B in the SJVAPCD would equal the estimates shown in Table 22-63.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6B would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-63) and, thus, would not expose sensitive receptors to substantial DPM concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats associated with DPM during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-26). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-63, this alternative would generate PM2.5 concentrations that would exceed the SJVAPCD's PM2.5 thresholds, and would expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would be adverse. Mitigation Measure AQ-12 is available to reduce this effect.

CEQA Conclusion**:** The DPM generated during Alternative 6B construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would exceed the SJVAPCD's thresholds (Table 22-31) and, thus, would expose sensitive receptors to substantial pollutant concentrations and significant health threats. DWR has identified several environmental commitments to reduce construction-related emissions, including DPF for heavy-duty construction equipment, which are incorporated in the emissions modeling shown in Table 22-26. DPF are anticipated to reduce DPM by approximately 85%, compared to engines without a DPF (see Appendix 22A, *Air Quality Analysis Assumptions*). While this commitment will substantially reduce DPM and associated health threats, PM2.5 concentrations would still exceed the SJVPACD's 24-hour PM2.5 threshold. The primary cause of these PM2.5 exceedances is a proposed concrete batch plant that would be located in San Joaquin County just south of the Consumnes River and west of the canal alignment. This batch plant would cause exceedances at two residences located just north of the plant. The plant would be located within 500 feet of the closest residence and within 700 feet of the second closest residence. Both residences could be exposed to PM2.5 concentrations that exceed the SJVAPCD's 24-hour PM2.5 significance threshold. Mitigation Measure AQ-12 would be available to reduce PM2.5 exposure to a less-than-significant level by reducing PM2.5 concentrations to levels below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-12: Increase Distance between Batch Plant and Sensitive Receptors

Please see Mitigation Measure AQ-12 under Impact AQ-12 in the discussion of Alternative 1B.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 2B. Therefore, the health threats generated by Alternative 2B would be representative of emissions generated by Alternative 6B. The health threats generated by construction of Alternative 6B in the BAAQMD would equal the estimates shown in Table 22-64.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-64) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-26). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-64, this alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: The DPM generated during Alternative 6B construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's thresholds (Table 22-64) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 6B would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 6B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-33, construction of Alternative 6B would generate a total of 938,133 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 6B would generate a total of 938,133 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 6B would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-110).

Table 22-110 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-110 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-110. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 6B (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e}: NEPA Point of Comparison	Electricity CO_{2e}: CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e: NEPA Point of Comparison	Total CO_2e: CEQA Baseline
Emissions without State Targets						
2025 Conditions	93	-	-426,675	0	-	-426,582
2060 Conditions	93	-236,233	-555,860	-18,728	-254,868	-574,495
Emissions with State Targets						
2025 Conditions	78	-	-325,975	0	-	-325,897
2060 Conditions	76	-180,479	-424,671	-18,728	-199,131	-443,322

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 6B to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-36 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-36 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 6B would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be **no impact** on SWP operational emissions.

A small amount of additional GHG emissions would be emitted as a result of the maintenance of new facilities associated with Alternative 6B (Table 22-110). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

NEPA Effects: Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 6B would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 6B would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 6B is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.
CEQA Conclusion**:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 6B would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 6B with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 6B, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 6B is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 6B would reduce GHG emissions by 19,610 to 25,704 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Implementation of Alternative 6B is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 6B would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 6B could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.13 Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D

A total of five intakes would be constructed under Alternative 6C. They would be sited on the west bank of the Sacramento River, opposite the locations identified for the pipeline/tunnel and east alignments. Under this alternative, water would be carried south in a canal along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay (Figures 3-6 and 3-15 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 6C would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 6C electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Construction emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. Refer to Table 22-29 for a summary of criteria pollutants during construction (years 2014 through 2022) of Alternative 1C that are applicable to this alternative. Operational emissions would be different from Alternative 1C and are provided in Table 22-111. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-111. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 6C (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	-1	-14	-235	-16	-16	-433
2060	NEPA	-1	-7	-117	-8	-8	-215
2060	CEQA	-2	-18	-319	-21	-21	-587

NEPA = Compares criteria pollutant emissions after implementation of Alternative 6C to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 6C to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-39, construction emissions would exceed YSAQMD's thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG (annual): 2015 through 2019
- NO_X (annual): 2014 through 2020
- PM10 (daily): 2015 through 2018

While equipment could operate at any work area identified for this alternative, the highest level of emissions in the YSAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the YSAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-39, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-2a and AQ-2b would be available to reduce ROG, NO_X, and PM10 through contracts with SMAQMD that result in offsite mitigation within the YSAQMD. Although Mitigation Measures AQ-2a and AQ-2b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[59] Accordingly, this effect would be adverse.

CEQA Conclusion**:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed YSAQMD's thresholds identified in Table 22-9. The YSAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce ROG, NO_X, and PM10, given the magnitude of estimated emissions, neither measure would reduce ROG and NO_X below district thresholds. Accordingly, this effect would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

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[59] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-39, emissions would exceed SMAQMD's daily NO_X threshold for years 2014 and 2019, even with implementation of environmental commitments. Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's concentration-based threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and PM10 emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River, as well as the intermediate pumping plant site. See the discussion of Impact AQ-2 under Alternative 1C.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; the use of CNG, tier 4 engines, and DPFs; and BMPs including proper engine maintenance and idling restrictions (see Appendix 3B, *Environmental Commitments*). These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-39, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, neither measure would reduce NO_X emissions below district thresholds. Likewise, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[60] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions and generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation

[60] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, neither measure would reduce NO_X emissions below district thresholds. Likewise, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions. This impact would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-39, construction emissions would exceed BAAQMD's daily thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2015 through 2019
- NO_X: 2014 through 2020

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and northwest of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-39, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would not reduce emissions below district thresholds.[61] Accordingly, this effect would be adverse.

[61] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would not reduce emissions below district thresholds. Accordingly, this impact would be significant and unavoidable.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 6C would occur in the YSAQMD SMAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, construction of Alternative 6C would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed SJVAPCD's thresholds of significance. This impact is would be less than significant.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-40, emissions would not exceed YSAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed YSAQMD's thresholds for criteria pollutants. The YSAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate YSAQMD's thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SFNA. The impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-40, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1C.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 6C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-40, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1C.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 6C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 6C would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect to air quality.

CEQA Conclusion**:** Operational emissions generated by the alternative would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate SJVAPCD thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SJVAB. This impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. Please see the discussion of Impact AQ-9 under Alternative 1C.

Sacramento Federal Nonattainment Area

As shown in Table 22-41 implementation of Alternative 6C would exceed SFNA federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2015 through 2017
- NO_X: 2014 through 2019
- CO: 2015 through 2018

ROG and NO_X are a precursors to ozone, for which the SFNA is in nonattainment for the NAAQS. Likewise, the SVAB is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and CO would conform to the appropriate SVAB ozone and CO SIPs for each year of construction for which the *de minimis* thresholds are exceeded.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SFNA federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. Likewise, although Mitigation Measures AQ-2a and AQ-2b would reduce ROG and NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 6C is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for ROG, NO_X, and CO through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

No emissions would be generated in the SJVAB.

San Francisco Bay Area Air Basin

As shown in Table 22-41 implementation of Alternative 6C would exceed SFBAAB federal *de minimis* thresholds for the following pollutants and years.

- NO_X: 2015 through 2017
- CO: 2016

NO_X is a precursor to ozone, for which the SFBAAB is in nonattainment for the NAAQS. Likewise, the SFBAAB is designated as a moderate maintenance area for CO. Since project emissions exceed the federal *de minimis* threshold for NO_X and CO, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SFBAAB ozone and CO SIPs.

Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets. As noted above, DWR has identified several environmental commitments to reduce construction-related criteria pollutants. However, because the current emissions estimates exceed the SFBAAB federal *de minimis* threshold for CO, a positive conformity determination for CO cannot be reached. Likewise, although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 6C is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and CO through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

***CEQA Conclusion*:** SFNA and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. General conformity cannot be satisfied for ROG, NO_X, CO through the purchase of offsets within the SFNA, or for NO_X and CO within the SFBAAB. A positive conformity determination for ROG, NO_X, CO in the SFNA and NO_X and CO in the SFBAAB cannot be reached. This impact would therefore be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by 6C. The health threats generated by construction of Alternative 6C in the YSAQMD would equal the estimates shown in Table 22-42.

Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-42) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** The DPM generated during Alternative 6C construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by 6C. The health threats generated by construction of Alternative 6C in the SMAQMD would equal the estimates shown in Table 22-43.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM.

Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-43) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion: The health threats resulting from DPM generated by Alternative 6C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by 6C. The health threats generated by construction of Alternative 6C in the SJVAPCD would equal the estimates shown in Table 22-44.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6C would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-44) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-39). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-42, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** The DPM generated during Alternative 6C construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the SJVAPCD's thresholds (Table 22-44) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Therefore, the health threats generated by Alternative 1C would be representative of emissions generated by 6C. The health threats generated by construction of Alternative 6C in the BAAQMD would equal the estimates shown in Table 22-45.

This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 6B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-45) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-39). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-45, this alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** The DPM generated during Alternative 6C construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's thresholds (Table 22-45) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 6C would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion**:** Alternative 6C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-46, construction of Alternative 6C would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion**:** Construction of Alternative 6C would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 6C would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-112).

Table 22-112 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-112 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-112. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 6C (metric tons/year)

		Electricity CO_{2e}		Concrete	Total CO_2e	
Year	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	Absorption (CO_2)[a]	NEPA Point of Comparison	CEQA Baseline
Emissions without State Targets						
2025 Conditions	99	-	-371,786	0	-	-371,687
2060 Conditions	99	-184,983	-504,610	-29,503	-213,937	-533,564
Emissions with State Targets						
2025 Conditions	79	-	-284,040	0	-	-283,961
2060 Conditions	77	-141,325	-385,517	-29,503	-170,301	-414,493

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 6C to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-49 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-49 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 6C would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions would be emitted as a result of the maintenance of new facilities associated with Alternative 6C (Table 22-112). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

NEPA Effects: Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 6C would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 6C would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 6C is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.
***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 6C would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 6C with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 6C, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 6C is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 6C would reduce GHG emissions by 19,610 to 25,704 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

CEQA Conclusion: Implementation of Alternative 6C is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion: Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 6C would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion**:** The restoration and enhancement actions under Alternative 6C could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.14 Alternative 7—Dual Conveyance with Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)

For the purposes of this analysis, it was assumed that Intakes 2, 3, and 5 would be constructed under Alternative 7. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-11 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 7 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 7 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-113, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-113. Total Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 7 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	3	0	0	5
2017	-	0	0	4	0	0	8
2018	-	0	1	9	1	1	17
2019	-	0	2	41	3	3	76
2020	-	0	3	60	4	4	111
2021	-	0	4	70	5	5	129
2022	-	0	3	44	3	3	81
2023	-	0	1	15	1	1	28
2024	-	0	1	15	1	1	28
2025	CEQA	-2	-17	-293	-20	-20	-538
2060	NEPA	-1	-9	-161	-11	-11	-296
2060	CEQA	-2	-21	-363	-24	-24	-668

NEPA = Compares criteria pollutant emissions after implementation of Alternative 7 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 7 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-114 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

1 **Table 22-114. Criteria Pollutant Emissions from Construction of Alternative 7 (pounds/day and tons/year)**

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	2	14	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	26	195	110	5	2	7	1	2	3	1	2	18	10	0	0	0	0	0	0	0
2018	18	132	86	5	1	7	1	1	2	1	2	17	11	0	0	0	0	0	0	0
2019	103	674	443	6	5	11	1	5	6	3	11	73	49	0	1	1	0	1	1	0
2020	71	434	316	6	3	10	1	3	4	2	8	47	35	0	0	1	0	0	0	0
2021	17	85	71	5	1	6	1	1	1	0	3	15	13	0	0	0	0	0	0	0
2022	15	72	65	5	0	6	1	0	1	0	0	2	2	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	90	421	470	7	2	9	1	2	3	2	2	8	10	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	42	320	165	0	3	3	0	3	3	2	4	29	15	0	0	0	0	0	0	0
2017	143	1,029	564	34	7	40	5	7	12	3	9	67	38	2	1	3	0	1	1	0
2018	196	1,355	814	35	9	43	5	9	14	4	17	122	73	2	1	3	0	1	1	0
2019	143	967	645	34	6	39	5	6	11	3	14	94	63	2	1	3	0	1	1	0
2020	93	586	424	33	4	37	5	3	9	1	10	61	48	2	0	2	0	0	1	0
2021	53	276	257	33	2	35	5	2	7	1	5	24	24	2	0	2	0	0	0	0
2022	67	335	326	33	2	35	5	2	7	1	5	29	27	2	0	2	0	0	0	0
2023	43	232	235	5	1	6	4	1	5	1	1	4	4	2	0	2	0	0	0	0
2024	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2016	28	208	101	0	1	1	0	1	1	0	1	6	3	0	0	0	0	0	0	0
2017	26	187	98	22	1	23	3	1	4	0	1	11	6	2	0	2	0	0	0	0
2018	53	382	246	22	2	25	3	2	6	2	3	21	14	2	0	2	0	0	0	0
2019	55	336	263	23	3	25	3	3	6	2	5	31	25	2	0	2	0	0	1	0
2020	51	287	251	23	3	25	3	3	6	2	8	46	41	2	0	2	0	0	1	0
2021	40	208	203	22	2	24	3	2	6	2	7	37	36	2	0	2	0	0	1	0
2022	36	190	199	22	2	24	3	2	5	2	5	26	26	2	0	2	0	0	1	0
2023	22	124	112	3	1	4	3	1	4	0	3	18	17	2	0	2	0	0	0	0
2024	21	115	111	3	1	4	3	1	4	0	1	4	3	2	0	2	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 7 would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Operations and maintenance activities required for Alternative 7 were assumed to equal activities required for Alternative 4. Emissions generated by Alternative 4 would therefore be representative of emissions generated by Alternative 7. Table 22-88 summarizes criteria pollutant emissions associated with operation of Alternative 4 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 7 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 7 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-114, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 would exceed the district's threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including all intake and intake pumping plant sites and the intermediate forebay site, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5) would exceed the district's threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-114, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[62] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions

[62] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-114, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019, 2020, and 2024
- NO_X: 2017 through 2022 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-114, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

CEQA Conclusion**:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-114, construction emissions would exceed SJVAPCD's annual NO_X threshold for all years between 2017 and 2023, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-114, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 7 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 4 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. Operations and maintenance activities required for Alternative 7 were assumed to equal activities required for Alternative 4. Emissions generated by Alternative 4 would therefore be representative of emissions generated by Alternative 7. As shown in Table 22-88, operation and maintenance activities under Alternative 4 would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations under Alternative 7 would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. Operations and maintenance activities required for Alternative 7 were assumed to equal activities required for Alternative 4. Emissions generated by Alternative 4 would therefore be representative of emissions generated by Alternative 7. As shown in Table 22-88, operation and maintenance activities under Alternative 4 would not exceed BAAQMD's thresholds of significance (see Table 22-9). Thus, project operations under Alternative 7 would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Annual inspections are limited to work on the gate control structure, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SJVPACD are expected at construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Operations and maintenance activities required for Alternative 7 were assumed to equal activities required for Alternative 4. Emissions generated by Alternative 4 would therefore be representative of emissions generated by Alternative 7. As shown in Table 22-88, operation and maintenance activities under Alternative 4 would not exceed SJVAPCD's thresholds of significance (see Table 22-9). Accordingly, project operations under Alternative 7 would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 4 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-115. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-115. Criteria Pollutant Emissions from Construction and Operation of Alternative 7 in the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	4	29	15	0	0	0
2017	9	67	38	3	1	0
2018	17	122	73	3	1	0
2019	14	94	63	3	1	0
2020	10	61	48	2	1	0
2021	5	24	24	2	0	0
2022	5	29	27	2	0	0
2023	1	4	4	2	0	0
2024	0	0	0	0	0	0
2025	0.01	0.12	0.14	0.00	0.00	0.00
2060	0.01	0.12	0.13	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	1	6	3	0	0	0
2017	1	11	6	2	0	0
2018	3	21	14	2	0	0
2019	5	31	25	2	1	0
2020	8	46	41	2	1	0
2021	7	37	36	2	1	0
2022	5	26	26	2	1	0
2023	3	18	17	2	0	0
2024	1	4	3	2	0	0
2025	0.00	0.04	0.03	0.00	0.00	0.00
2060	0.00	0.04	0.02	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*
	San Francisco Bay Area Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	2	18	10	0	0	0
2018	2	17	11	0	0	0
2019	11	73	49	1	1	0
2020	8	47	35	1	0	0
2021	3	15	13	0	0	0
2022	0	2	2	0	0	0
2023	0	0	0	0	0	0
2024	2	8	10	0	0	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-115, implementation of Alternative 7 would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2016 and 2020 and in 2022. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2020 and in 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-115, implementation of Alternative 7 would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-115, implementation of the Alternative 7 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*, this impact would be less than significant with mitigation.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources

of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-114, construction of Alternative 7 would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 7 would be similar to Alternative 1A. As shown in Table 22-15, Alternative 7 would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 7 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-114, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion*

Modeling and Health Risk Assessment for Construction Emissions, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 7 would be similar to Alternative 1A. As shown in Table 22-16, Alternative 7 would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 7 construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-114, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 7 would be similar to Alternative 1A. As shown in Table 22-17, Alternative 7 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health risks during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-114). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 7 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-114, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 7 would be similar to Alternative 1A. As shown in Table 22-18, Alternative 7 would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 7 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 7 would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

***CEQA Conclusion*:** Alternative 7 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 7 are presented in Table 22-116. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established. Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-116).

Table 22-116. GHG Emissions from Construction of Alternative 7 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments				
2016	5,776	4,133	94,103	104,012
2017	17,525	6,481	94,103	118,109
2018	32,408	13,877	94,103	140,388
2019	45,413	63,505	94,103	203,022
2020	40,778	95,083	94,103	229,964
2021	24,345	110,930	94,103	229,378
2022	18,541	69,944	94,103	182,589
2023	6,498	23,771	94,103	124,371
2024	4,739	23,771	94,103	122,613
Total	*196,024*	*411,494*	*846,928*	*1,454,445*
Emissions with Environmental Commitments and State Mandates				
2016	4,720	3,516	94,103	102,339
2017	17,036	5,373	94,103	116,512
2018	29,800	11,204	94,103	135,107
2019	41,655	49,895	94,103	185,653
2020	36,015	72,642	94,103	202,761
2021	21,563	84,749	94,103	200,415
2022	16,496	53,437	94,103	164,035
2023	5,794	18,161	94,103	118,058
2024	4,227	18,161	94,103	116,490
Total	*177,307*	*317,136*	*846,928*	*1,341,371*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-118).

Values may not total correctly due to rounding.

Table 22-117 summarizes total GHG emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-117 are therefore provided for information purposes only.

Table 22-117. GHG Emissions from Construction of Alternative 7 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	44,094	169,386	213,480
SMAQMD	97,405	508,157	605,562
SJVACD	54,524	169,386	223,910
Emissions with Environmental Commitments and State Mandates			
BAAQMD	40,101	169,386	209,486
SMAQMD	88,228	508,157	596,385
SJVAPCD	48,978	169,386	218,363

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-118).

Construction of Alternative 7 would generate a total of 1.3 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding approximately 268,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 7 would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 7 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-118).

Table 22-118 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-118 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-118. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 7 (metric tons/year)

		Electricity CO_{2e}		Concrete	Total CO_2e	
Year	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	Absorption (CO_2)[a]	NEPA Point of Comparison	CEQA Baseline
Emissions without State Targets						
2025 Conditions	161	-	-462,458	0	-	-462,298
2060 Conditions	161	-254,125	-573,752	-35,571	-289,535	-609,162
Emissions with State Targets						
2025 Conditions	137	-	-353,313	0	-	-353,176
2060 Conditions	136	-194,148	-438,340	-35,571	-229,584	-473,775

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 7 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-97 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-97 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 7 would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions would be emitted as a result of the maintenance of new facilities associated with Alternative 7 (Table 22-118). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

NEPA Effects: Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 7 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 7 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 7 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 7 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 7 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 7, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 7 is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 7 would reduce GHG emissions by 21,917 to 28,728 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

CEQA Conclusion: Implementation of Alternative 7 is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion: Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 7 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 7 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.15 Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)

For the purposes of this analysis, it was assumed that Intakes 2, 3, and 5 (on the east bank of the Sacramento River) would be constructed under Alternative 8. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-11 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 8 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 8 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Construction emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. Refer to Table 22-113 for a summary of criteria pollutants during construction (years 2016 through 2024) of Alternative 7 that are applicable to this alternative. Operational emissions would be different from Alternative 7 and are provided in Table 22-119. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-119. Criteria Pollutant Emissions from Electricity Consumption during Operation of Alternative 8 (tons/year)

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2025	CEQA	-3	-28	-489	-33	-33	-900
2060	NEPA	-2	-20	-351	-23	-23	-646
2060	CEQA	-3	-32	-554	-37	-37	-1,018

NEPA = Compares criteria pollutant emissions after implementation of Alternative 8 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 8 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 8 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 8 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-114, emissions would exceed SMAQMD's daily NO_X threshold for all years between 2016 and 2023, even with implementation of environmental commitments. Because ground disturbance would exceed 15 acres per day, emissions of PM10 would exceed the district's threshold. While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of

South Stone Lake and east of the Sacramento River. See the discussion of Impact AQ-2 under Alternative 7.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-114, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions. However, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[63] Accordingly, this would be an adverse effect.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-9). No feasible mitigation is available to reduce PM10 (and, therefore, PM2.5) emissions to a less-than-significant level; therefore the impact would remain significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity

[63] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

***De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants**

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-114, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019, 2020, and 2024
- NO_X: 2017 through 2022 and 2024

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-114, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-114, construction emissions would exceed SJVAPCD's annual NO_X threshold for all years between 2017 and 2023, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. See the discussion of Impact AQ-4 under Alternative 7.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-114, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-9).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity

De Minimis Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 8 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 8 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

CEQA Conclusion**:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 8 were assumed to equal activities required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-88, emissions would not exceed SMAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 7.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 8 were assumed to equal activities required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-88, emissions would not exceed BAAQMD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 7.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities required for Alternative 8 were assumed to equal activities required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-88, emissions would not exceed SJVAPCD's thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 7.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. Please see the discussion of Impact AQ-9 under Alternative 7.

Sacramento Federal Nonattainment Area

As shown in Table 22-115, implementation of Alternative 8 would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2016 and 2020 and in 2022. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2016 and 2022.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-2a and AQ-2b, which requires additional onsite mitigation and/or offsets. Mitigation Measures AQ-2a and AQ-2b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions

within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-115, implementation of Alternative 8 would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2017 and 2023. NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB ozone SIP for each year of construction between 2017 and 2023.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which requires additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-115, implementation of the Alternative 8 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-2a, 2b, 4a, and AQ-4 would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA and SJVAB, respectively. These measures would therefore ensure total direct and indirect emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Because a positive conformity determination has been made for all Study area air basins (see Appendix 22E, *Conformity Letters*, this impact would be less than significant with mitigation).

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs. DPM poses inhalation-related chronic non-cancer and cancer health threats.

The BDCP will involve the operation of hundreds of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. Primary sources of DPM from construction include exhaust emissions from off-road vehicles (e.g., loaders, dozers, graders) and portable equipment (e.g., compressors, cranes, generators), as well as barges carrying construction materials.

As shown in Table 22-114, construction of Alternative 8 would result in an increase of DPM emissions in the Study area. While equipment could operate at any work area identified for this alternative, the highest level of DPM emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, all temporary and permanent utility sites, and all construction sites along this alignment. Sensitive receptors adjacent to these work areas could be exposed to increased health threats.

The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 70 to 95 excess cancers per million people (1996 estimate) (U.S. Environmental Protection Agency 2012c). This risk is independent of activity associated with the proposed water conveyance facility. As described previously, this analysis considers the chronic non-cancer and cancer effects of this alternative's DPM emissions on sensitive receptors in the YSAQMD's jurisdiction. Although this alternative would not generate DPM emissions within Yolo County, the emissions generated in the adjacent Sacramento County may affect sensitive receptors that are located in Yolo County near the intake construction activities along the Sacramento River. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 8 would be similar to Alternative 1A. As shown in Table 22-15, Alternative 8 would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 8 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-114, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 8 would be similar to Alternative 1A. As shown in Table 22-16, Alternative 8 would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 8 construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-114, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 8 would be similar to Alternative 1A. As shown in Table 22-17, Alternative 8 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-114). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-17, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 8 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the SJVAPCD's thresholds (Table 22-17) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-114, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, non-cancer hazards and cancer risks associated with Alternative 8 would be similar to Alternative 1A. As shown in Table 22-18, Alternative 8 would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 8 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

This alternative's PM2.5 emissions during construction would not exceed the BAAQMD's threshold (Table 22-18) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 8 would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 8 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 7. As shown in Table 22-116, construction of Alternative 8 would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse.

Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 8 would generate a total of 1.3 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 8 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-120).

Table 22-120 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-120 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-120. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 8 (metric tons/year)

Year	Equipment CO_2e	Electricity CO_2e NEPA Point of Comparison	Electricity CO_2e CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
Emissions without State Targets						
2025 Conditions	161	-	-772,988	0	-	-772,827
2060 Conditions	161	-554,950	-874,577	-35,571	-590,630	-909,987
Emissions with State Targets						
2025 Conditions	137	-	-590,554	0	-	-590,417
2060 Conditions	136	-423,975	-668,167	-35,571	-459,411	-703,602

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 8 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

Table 22-97 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-97 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 8 would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions would be emitted as a result of the maintenance of new facilities associated with Alternative 8 (Table 22-120). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

NEPA Effects: Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 8 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 8 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 8 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

CEQA Conclusion: SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 8 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 8 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 8, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 8 is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 8 would reduce GHG emissions by 23,993 to 31,450 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

CEQA Conclusion: Implementation of Alternative 8 is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 8 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 8 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

Under Alternative 9, two intakes would be constructed at the entrances to the Delta Cross Channel and Georgiana Slough. These intakes would consist of fish screens placed on the existing channels. Two small pumping plants would be constructed on the San Joaquin River at the head of Old River and on Middle River upstream of Victoria Canal. There would be no new forebay. The conveyance would be through existing canals and Delta channels, with modifications to the levees and channels, operable barriers, a fish movement corridor around Clifton Court Forebay, and a water supply corridor.

Construction and operation of Alternative 9 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 9 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-121, are therefore provided for informational purposes only and are not included in the impact conclusion. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-121. Criteria Pollutant Emissions from Electricity Consumption during Construction and Operation of Alternative 9 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2014	-	0	0	2	0	0	5
2015	-	0	0	5	0	0	8
2016	-	0	0	7	0	0	13
2017	-	0	1	9	1	1	16
2018	-	0	0	7	0	0	13
2019	-	0	0	6	0	0	11
2020	-	0	0	3	0	0	5
2025	CEQA	-1	-8	-145	-10	-10	-266
2060	NEPA	0	-1	-15	-1	-1	-28
2060	CEQA	-1	-13	-217	-15	-15	-399

NEPA = Compares criteria pollutant emissions after implementation of Alternative 9 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 9 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Assumptions*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-12 and AQ-13.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Mobile and stationary construction equipment exhaust, employee vehicle exhaust, and dust from clearing the land would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-122 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton).

As discussed in Section 22.3.1.1, daily emissions represent a conservative assessment of construction impacts due to calculation methodology. Moreover, as shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Violations of the air district thresholds are shown in underlined text.

1 **Table 22-122. Criteria Pollutant Emissions from Construction of Alternative 9 (pounds/day and tons/year)**

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	12	92	44	13	1	14	2	1	2	0	1	7	3	1	0	1	0	0	0	0
2015	33	284	108	6	2	7	1	2	2	0	6	47	18	0	0	1	0	0	0	0
2016	50	423	204	9	2	11	1	2	4	1	7	60	27	0	0	1	0	0	0	0
2017	52	411	190	9	2	12	1	2	4	1	7	57	26	0	0	1	0	0	0	0
2018	39	265	159	7	2	9	1	2	3	1	3	20	12	0	0	1	0	0	0	0
2019	0	0	0	5	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	5	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	-	*82*	-	-	*54*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	123	1,137	401	6	6	13	1	6	7	1	19	176	62	0	1	1	0	1	1	0
2015	116	1,039	387	6	6	12	1	6	7	1	10	86	32	0	0	1	0	0	1	0
2016	76	622	258	6	3	9	1	3	4	1	12	101	41	0	1	1	0	1	1	0
2017	71	550	246	6	3	9	1	3	4	1	7	52	24	0	0	1	0	0	0	0
2018	58	429	205	5	2	8	1	2	3	1	8	58	28	0	0	1	0	0	0	0
2019	55	384	201	5	2	7	1	2	3	1	7	46	24	0	0	1	0	0	0	0
2020	52	342	197	5	2	7	1	2	3	1	5	36	21	0	0	1	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2	ROG	NO_X	CO	Dust	Exhaust	Total	Dust	Exhaust	Total	SO_2
2014	97	970	355	17	6	23	2	6	8	1	7	83	29	1	1	1	0	1	1	0
2015	91	916	328	7	5	12	1	5	6	1	13	130	47	0	1	1	0	1	1	0
2016	93	875	343	8	5	13	1	5	6	1	8	71	28	0	0	1	0	0	0	0
2017	22	305	106	6	2	8	1	2	3	0	2	33	11	0	0	1	0	0	0	0
2018	28	383	135	8	2	10	1	2	3	0	4	61	22	0	0	1	0	0	0	0
2019	26	362	129	8	2	10	1	2	3	0	3	40	15	0	0	1	0	0	0	0
2020	0	0	0	5	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 9 would result in mobile-source emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-123 summarizes criteria pollutant emissions associated with operation of Alternative 9 in the SJVAPCD in pounds per day and tons per year (no emissions would be generated in the BAAQMD, SMAQMD, or YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-9).

Table 22-123. Criteria Pollutant Emissions from Operation of Alternative 9 (pounds per day and tons per year)

Maximum Daily Emissions (pounds/day)							Annual Emissions (tons/year)					
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
2025	0.08	0.68	0.99	0.02	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00
2060	0.07	0.65	0.87	0.02	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 9 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 9 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-122, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2014 and 2020, even with implementation of environmental commitments. While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest.

SMAQMD has also established the PM10 CAAQS as a threshold for the evaluation of construction-related fugitive dust emissions. Because PM2.5 is a subset of PM10, the district assumes that projects in excess of the PM10 CAAQS would result also in an adverse effect on PM2.5 emissions (Sacramento Metropolitan Air Quality Management District 2011). SMAQMD's recently adopted guidelines consider projects that implement all SMAQMD-required BMPs and disturb less than 15 acres per day (i.e., grading, excavation, cut and fill) to not have the potential to exceed the PM10 CAAQS. While DWR would require the implementation of all SMAQMD-required BMPs, based on the level of activities associated with project construction, it is anticipated that ground disturbance would exceed 15 acres per day, and therefore emissions of PM10 would exceed the district's threshold. While groundbreaking will occur throughout the project area, areas with the largest construction footprints, including fish screens and operable barriers, are expected to disturb the most ground on a daily basis. Because ground disturbance is expected to exceed 15 acres per day, emissions of PM10 (and, therefore, PM2.5) would exceed the district's threshold.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include electrification of heavy-duty offroad equipment; fugitive dust control measures; and the use of CNG, tier 4 engines, and DPF. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-122, NO_X emissions would still exceed the air district threshold identified in Table 22-9 and would result in an adverse effect to air quality. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, this measure would not reduce emissions below district thresholds.[64] Likewise, no feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions.[65] Accordingly, this would be an adverse effect.

CEQA Conclusion**:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-9. Likewise, construction would disturb more than 15 acres per day, which pursuant to SMAQMD's CEQA Guidelines, indicates that construction activities could exceed or contribute to the district's concentration-based threshold of significance for PM10 (and, therefore, PM2.5) at offsite receptors.

The SMAQMD's emissions thresholds (Table 22-9) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-2a and AQ-2b would be available to reduce NO_X, given the magnitude of estimated emissions, this measure could not feasibly reduce emissions below district thresholds. Likewise, no

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[64] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

[65] As discussed in Chapter 2, *Project Objectives and Purpose and Need*, Section 2.5, the proposed project is needed to both improve delta ecosystem health and productivity, as well as enhance water supply reliability and quality. Timely completion of the project is critical to ensuring these objectives are met. Consequently, construction activities cannot be extended over a longer time period to reduce daily emissions without jeopardizing the potential environmental benefits associated with the project. Likewise, extending the construction period would unduly increase project costs.

feasible measures beyond the identified environmental commitments would be available to reduce PM10 (and, therefore, PM2.5) emissions. This impact would be significant and unavoidable.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-122, construction emissions would exceed BAAQMD's daily NO_X for all years between 2014 and 2018, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-122, NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ozone precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-9. The BAAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General

Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-122, construction emissions would exceed SJVAPCD's annual NO_X threshold for all years between 2014 through 2019, even with implementation of environmental commitments. The annual ROG threshold would also be exceed in 2015. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

As noted above, environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-123, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-9 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ROG and NO_X generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-9. The SJVAPCD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would reduce this impact to less-than-significant levels.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the YSAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 9 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 9 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily activities at all pumping plants and operable barriers are covered by maintenance, management, repair, and operating crews. Annual inspections include work on the gate control structures (see Appendix 22A, *Air Quality Analysis Assumptions,* for additional detail). Accordingly, the highest concentration of operational emissions in the SMAQMD is expected at the fish screen and operable barrier locations. As shown in Table 22-123, operation and maintenance activities under Alternative 9 would not exceed SMAQMD's thresholds of significance and there would be no adverse effect (see Table 22-9). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. The SMAQMD's emissions thresholds (Table 22-9) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD thresholds, the impact would be less than significant.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 9 would not construct any permanent features in the BAAQMD that would require routine operations and maintenance. No operational emissions would be BAAQMD in the BAAQMD. Consequently, operation of Alternative 9 would neither exceed the BAAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed BAAQMD's thresholds of significance. This impact would be less than significant.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 9 would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be SJVAPCD in the SJVAPCD. Consequently, operation of Alternative 9 would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed SJVAPCD's thresholds of significance. This impact would be less than significant.

Impact AQ-9: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Criteria pollutant emissions resulting from construction of Alternative 9 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-124. Violations of the federal *de minimis* thresholds are shown in underlined text.

Table 22-124. Criteria Pollutant Emissions from Construction and Operation of Alternative 9 in the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	19	176	62	1	1	0
2015	10	86	32	1	1	0
2016	12	101	41	1	1	0
2017	7	52	24	1	0	0
2018	8	58	28	1	0	0
2019	7	46	24	1	0	0
2020	5	36	21	1	0	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	7	83	29	1	1	0
2015	13	130	47	1	1	0
2016	8	71	28	1	0	0
2017	2	33	11	1	0	0
2018	4	61	22	1	0	0
2019	3	40	15	1	0	0
2020	0	0	0	0	0	0
2025	0.00	0.00	0.01	0.00	0.00	0.00
2060	0.00	0.00	0.01	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*
	San Francisco Bay Area Air Basin					
Year	ROG	NO_X	CO	PM10	PM2.5	SO_2
2014	1	7	3	1	0	0
2015	6	47	18	1	0	0
2016	7	60	27	1	0	0
2017	7	57	26	1	0	0
2018	3	20	12	1	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
2025	0.00	0.00	0.00	0.00	0.00	0.00
2060	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*100*	*100*	*100*	*-*	*100*	*100*

Sacramento Federal Nonattainment Area

As shown in Table 22-124, implementation of Alternative 9 would exceed the SFNA federal *de minimis* threshold for NO_X for all years between 2014 and 2020. NO_X is a precursor to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de* *minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA ozone SIP for each year of construction between 2014 and 2020.

Although Mitigation Measures AQ-2a and AQ-2b would reduce NO_X, given the magnitude of emissions, it could not feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 9 is selected, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-124, implementation of Alternative 9 would exceed the SJVAB federal *de minimis* threshold for NO_X for all years between 2014 and 2019. The federal *de minimis* threshold for ROG would also be exceeded in 2015. ROG and NO_X are precursors to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SJVAB ozone SIP for each year of construction for which the *de minimis* thresholds are exceed.

As shown in Appendix 22E, *Conformity Letters*, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional ROG or NO_X as construction-related ROG and NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or contributions to the SJVAPCD's VERA. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-124, implementation of the Alternative 9 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB ozone and CO SIPs.

***CEQA Conclusion*:** SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. This impact would therefore be significant. Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ozone in the SJVAB. These measures would therefore ensure total direct and indirect ozone emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero. Emissions generated within the SFBAAB would not exceed the SFBAAB *de minimis* thresholds and would therefore conform to the appropriate SFBAAB ozone and CO SIPs. Accordingly, a positive conformity determination has been made for emissions within the SFBAAB and SJVAB. This impact would be less than significant with mitigation. Mitigation Measures AQ-2a and 2b would ensure project emissions would not result in an increase in regional NO_X emissions in the SFNA. However, the general conformity cannot be satisfied for NO_X through the purchase of offsets within the SFNA. This impact would be significant and unavoidable.

Impact AQ-10: Exposure of Sensitive Receptors to Health Threats in Excess of YSAQMD's Health-Risk Assessment Thresholds

NEPA Effects: The approach used to evaluate health threats is summarized in Section 22.3.1.3 and described in detail in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Construction activities for Alternative 9 would require the use of diesel-fueled engines that generate DPM emissions. As shown in Table 22-122, these emissions would increase DPM emissions in the Study area, particularly near sites involved in the greatest duration and intensity of construction activities.

Although this alternative would not generate DPM emissions within the YSAQMD, the emissions generated by construction of an operable barrier between Brannon Island and Sherman Island on Three Mile Slough in Sacramento County have the potential to affect sensitive receptors in adjacent areas of Solano County. However, the closest sensitive receptor within the YSAQMD is more than two kilometers from the Three Mile Slough operable barrier.

Based on the substantial distances between Alternative 9 construction areas and sensitive receptors within YSAQMD, Alternative 9 would not result in exceedances of the YSAQMD's chronic non-cancer or cancer health thresholds and, thus, would not expose sensitive receptors to substantial pollutant

concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

CEQA Conclusion**:** Construction of Alternative 9 would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years. However, the closest sensitive receptors in the YSAQMD are more than two kilometers from the nearest Alternative 9 construction zones. Thus, the DPM generated during Alternative 9 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Threats in Excess of SMAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As shown in Table 22-122, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SMAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 9 would not exceed the SMAQMD's chronic non-cancer health thresholds, but would exceed its cancer thresholds (Table 22-125) and, therefore, would expose sensitive receptors to substantial pollutant concentrations. The maximally exposed individual associated with the exceedances of the cancer thresholds is located in the Walnut Grove/Locke area adjacent to areas where operable barriers and fish screens would be installed. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would be adverse.

CEQA Conclusion**:** Construction of the water conveyance features would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 9 construction would not exceed the SMAQMD's chronic non-cancer thresholds but would exceed its cancer thresholds, and thus expose receptors to substantial pollutant concentrations and health threats. Several residences in the Walnut Grove/Locke area would be exposed to these excessive DPM concentrations. The location of the emission sources – fish screens and operable barriers - cannot be changed. Also, due to the large number of sensitive receptors that would be exposed to DPM emissions, it would be infeasible to relocate these residences. Consequently, no feasible mitigation is available to mitigate this impact beyond the environmental commitments to reduce construction-related emissions already incorporated into the emissions (see Appendix 3B, *Environmental Commitments)*. Therefore, Alternative 9 would result in significant and unavoidable health threats from DPM exposure.

Table 22-125. Alternative 9 Health Threats in the Sacramento Metropolitan Air Quality Management District

Alternative 9	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.0107	28.5 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-12: Exposure of Sensitive Receptors to Health Threats in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-122, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the SJVAPCD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 9 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-126) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

In addition to generating DPM, this alternative would generate PM2.5 exhaust emissions from vehicles with diesel- and gasoline-fueled engines and fugitive PM2.5 dust from operating on exposed soils and concrete batching (Table 22-122). Similar to DPM, the highest PM2.5 emissions would be expected to occur at those sites where the duration and intensity of construction activities would be greatest. As indicated in Table 22-126, this alternative would generate PM2.5 concentrations that would not exceed the SJVAPCD's PM2.5 thresholds, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 9 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the SJVAPCD's thresholds (Table 22-126) and, thus, would not expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 emissions would be less than significant. No mitigation is required.

Table 22-126. Alternative 9 Health Threats in the San Joaquin Valley Air Pollution Control District

Alternative 9	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Total (μg/m^3)	PM2.5 24-hour Total (μg/m^3)
Maximum Value at MEI	0.00065	1.74 per million	0.01	1.37
Thresholds	1	10 per million	0.6	2.5

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
Note: Total PM2.5 thresholds includes PM2.5 exhaust emissions and fugitive dust-generated emissions.
MEI = maximally exposed individual.

Impact AQ-13: Exposure of Sensitive Receptors to Health Threats in Excess of BAAQMD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activities for this alternative would require the use of diesel-fueled engines that generate DPM emissions. As described in Impact AQ-10 above for this alternative and shown in Table 22-122, these emissions would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of construction activities. This HRA methodology assesses cancer risks and non-cancer hazards from exposure to inhaled DPM. The first step involved estimating DPM emissions. Next, air quality modeling was used to estimate annual DPM concentrations at nearby sensitive receptor locations. Those concentrations were then used to estimate the chronic non-cancer hazards and cancer risks associated with DPM. Health hazard and risk estimates were then compared to the BAAQMD's applicable health thresholds of significance to evaluate impacts associated with the calculated health threats.

The methodology described in Section 22.3.1.3 provides a more thorough summary of the methodology used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 9 would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (Table 22-127) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

This alternative would generate PM2.5 concentrations that would not exceed the BAAQMD's PM2.5 threshold, and would not potentially expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to health threats during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve the operation of thousands of pieces of mobile and stationary diesel-fueled construction equipment for multiple years in close proximity to sensitive receptors. The DPM generated during Alternative 9 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health threats would be less than significant. No mitigation is required.

This alternative's PM2.5 concentrations during construction would not exceed the BAAQMD's threshold (Table 22-127) and would not potentially expose sensitive receptors to significant health threats. Therefore, this impact for PM2.5 concentrations would be less than significant. No mitigation is required.

Table 22-127. Alternative 9 Health Threats in the Bay Area Air Quality Management District

Alternative 9	Chronic Health Hazard	Cancer Health Risk	PM2.5 Annual Exhaust (μg/m^3)
Maximum Value at MEI	0.00155	4.11 per million	0.008
Thresholds	1	10 per million	0.3

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-14: Creation of Potential Odors Affecting a Substantial Number of People during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, typical odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 9 would not result in the addition of a major odor producing facility. Temporary objectionable odors could be created by diesel emissions from construction equipment; however, these emissions would be temporary and localized and would not result in adverse effects.

CEQA Conclusion: Alternative 9 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. The impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-15: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, and SF_6) emissions resulting from construction of Alternative 9 are presented in Table 22-128. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-128. GHG Emissions from Construction of Alternative 9 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)[b]	Total CO_2e
Emissions with Environmental Commitments				
2014	30,323	3,342	36,300	69,966
2015	32,562	6,248	36,300	75,110
2016	32,748	10,055	36,300	79,103
2017	21,087	12,644	36,300	70,031
2018	21,192	10,673	36,300	68,166
2019	14,104	9,412	36,300	59,817
2020	8,258	3,967	36,300	48,525
Total	*160,275*	*56,340*	*254,103*	*470,718*
Emissions with Environmental Commitments and State Mandates				
2014	29,825	2,988	36,300	69,113
2015	31,703	5,451	36,300	73,454
2016	31,528	8,554	36,300	76,383
2017	19,973	10,483	36,300	66,756
2018	19,756	8,617	36,300	64,674
2019	12,932	7,395	36,300	56,627
2020	7,403	3,030	36,300	46,734
Total	*153,120*	*46,518*	*254,103*	*453,741*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation.

[b] A portion of concrete batching emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-130).

Values may not total correctly due to rounding.

Table 22-129 summarizes total GHG emissions that would be generated in in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-128). GHG emissions presented in Table 22-129 are therefore provided for information purposes only.

Table 22-129. GHG Emissions from Construction of Alternative 9 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e
Emissions with Environmental Commitments			
BAAQMD	28,156	84,701	112,857
SMAQMD	84,081	84,701	168,782
SJVACD	48,037	84,701	132,738
Emissions with Environmental Commitments and State Mandates			
BAAQMD	26,953	84,701	111,654
SMAQMD	80,050	84,701	164,751
SJVACD	46,116	84,701	130,817

[a] Emissions assigned to each air district based on the number of batching plants located in that air district. A portion of emissions would be reabsorbed throughout the project lifetime through calcination (see Table 22-130).

Construction of Alternative 9 would generate a total of 453,741 metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding approximately 91,000 typical passenger vehicles to the road during one year (U.S. Environmental Protection Agency 2011b). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-15, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion**:** Construction of Alternative 9 would generate a total of 453,741 metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-15 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-15.

Mitigation Measure AQ-15: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-15 under Impact AQ-15 in the discussion of Alternative 1A.

Impact AQ-16: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

Operation of Alternative 9 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities. A portion of CO_2 emissions generated by calcination during cement manufacturing would also be absorbed into the limestone of concrete structures. This represents an emissions benefit (shown as negative emissions in Table 22-120).

Table 22-120 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both 2025 and 2060 conditions, although activities would take place annually until project decommissioning. Emissions with and without state targets to reduce GHG emissions (described in Impact AQ-15) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-120 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-130. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 9 (metric tons/year)

Year	Equipment CO_2e	Electricity CO_{2e} NEPA Point of Comparison	Electricity CO_{2e} CEQA Baseline	Concrete Absorption (CO_2)[a]	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
Emissions without State Targets						
2025 Conditions	6	-	-228,652	0	-	-228,645
2060 Conditions	5	-23,654	-343,281	-10,672	-34,321	-353,948
Emissions with State Targets						
2025 Conditions	5	-	-174,687	0	-	-174,682
2060 Conditions	5	-18,071	-262,262	-10,672	-28,738	-272,929

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 9 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

[a] Assumes that concrete will absorb 7% of CO_2 emissions generated by calcination during the lifetime of the structure. Given that 2025 conditions only occurs 3–5 years after concrete manufacturing, CO_2 absorption benefits were assigned to 2060 conditions.

NEPA Effects: As discussed above, Alternative 9 would not construct any permanent features that would require routine operations and maintenance.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 9 would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be no impact on SWP operational emissions. Alternative 9 would not add any permanent facilities that would substantially increase maintenance emissions. There would be no adverse effect.

CEQA Conclusion**:** Because BDCP Alternative 9 does not add additional electricity or substantial maintenance requirements to the SWP or CVP systems, BDCP Alternative 9 would have a less than significant impact with respect to GHG emissions. No mitigation is required.

Impact AQ-17: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased

CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 9, operation of the CVP yields a net generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 9 is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 9 would reduce GHG emissions by 5,768 to 7,560 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Implementation of Alternative 9 is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-18: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-24 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-18 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-9) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-9; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-19: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: Conservation Measures 2–11 implemented under Alternative 9 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-24. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 9 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

Mitigation Measure AQ-19: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-19 under Impact AQ-19 in the discussion of Alternative 1A.

22.3.3.17 Cumulative Analysis

Assessment Methodology

The air quality management agencies in the Study area have identified project-level thresholds to evaluate impacts to air quality (see Table 22-9). In developing these thresholds, the agencies considered levels at which project emissions would be cumulatively considerable. The air district thresholds have been adopted to prevent further deterioration of ambient air quality, which is influenced by emissions generated by projects within a specific air basin. The project-level thresholds therefore consider relevant past, present, and reasonably foreseeable future projects within the Plan area. For example, as noted in the BAAQMD's (2011) CEQA Guidelines,

> In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

And in the SMAQMD's (2011) CEQA Guidelines,

> The District's approach to thresholds of significance is relevant to whether a project's individual emissions would result in a cumulatively considerable adverse contribution to the SVAB's existing air quality conditions. If a project's emissions would be less than these levels, the project would not be expected to result in a cumulatively considerable contribution to the significant cumulative impact…If construction-generated NO_X emissions cannot be mitigated or offset below 85 lb/day, the project would substantially contribute to this **significant** air quality impact.

And in the SJVAPCD's (2002) CEQA Guidelines,

> Any proposed project that would individually have a significant air quality impact…would also be considered to have a significant cumulative air quality impact.

And in the YSAQMD's (2007) CEQA Guidelines,

> Any proposed project that would individually have a significant air quality impact (see above for project-level Thresholds of Significance) would also be considered to have a significant cumulative impact.

The emissions thresholds presented in Table 22-9 therefore represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. Therefore, exceedances of the project-level thresholds, as identified in Section 22.3.3, would be cumulatively considerable. As discussed in Section 22.3.2.1, the effects analysis for GHG emissions is cumulative due to the nature of GHGs and global climate change. Please refer to Impacts AQ-12, AQ-13, and AQ-15 in Section 22.3.3 for an evaluation of cumulative GHG impacts.

Cumulative Effects of the No Action Alternative

The cumulative effect of the No Action Alternative is anticipated to result in short-term emissions from construction activities and long-term reductions in criteria pollutants and GHG emissions. Construction of ongoing projects, programs, and plans under the No Action Alternative, when combined with emissions from ongoing and reasonably foreseeable future projects, would generate short-term emissions that could cumulatively affect regional and local air quality. Projects implemented under the No Action Alternative would be required to comply with air district rules and regulations to reduce construction-related criteria pollutant and GHG emissions. It is anticipated that similar construction projects in study area, including those listed in Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions* would also be required to implement similar measures to reduce project-level construction-related emissions. Long-term operation of the No Action Alternative would result in a net decrease in all criteria air pollutants and GHGs, potentially contributing to a regional air quality benefit. However, a portion of this benefit may be offset by operational emissions generated by future projects implemented in the study area.

The Delta and vicinity are within a highly active seismic area, with a generally high potential for major future earthquake events along nearby and/or regional faults, and with the probability for such events increasing over time. Based on the location, extent and non-engineered nature of many existing levee structures in the Delta area, the potential for significant damage to, or failure of, these structures during a major local seismic event is generally moderate to high. (See Appendix 3E, *Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies* for more detailed discussion). To reclaim land or rebuild levees after a catastrophic event due to climate change or a seismic event would introduce considerable heavy equipment and associated vehicles, including dozers, excavators, pumps, water trucks, and haul trucks, which would generate emissions and create adverse air quality effects. While similar risks would occur under implementation of the action alternatives, these risks may be reduced by BDCP-related levee improvements along with those projects identified for the purposes of flood protection in Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions*.

Cumulative Effects of the Action Alternatives

Impact AQ-20: Cumulative Generation of Criteria Pollutants in Excess of Air District Threshold during Construction of the Water Conveyance Facility

NEPA Effects: The project-level analysis performed in Section 22.3.3 evaluates significance within each Study area air district. While the thresholds summarized in Table 22-9 can likewise be applied to evaluate cumulative impacts within individual air districts, this impact assessment considers violations of one more air district threshold to result in a cumulatively considerable *regional* air quality impact. This approach was chosen out of an abundance of caution to capture regional air quality impacts and account for potential emissions transport between the four air district.

Table 22-131 summarizes the project-level effects for construction of the water conveyance facilities associated with Alternatives 1A, 2A, and 6A; 1B, 2B, and 6B; 1C, 2C, and 6C; 3; 4, 7, and 8; 5; and 9 in each Study area air district. Adverse effects are highlighted with <u>underline</u> text.

Table 22-131. Project-Level Determinations for Construction of the Water Conveyance Facilities Associated with BDCP (Impacts AQ-1 through AQ-4 and Impact AQ-9)

	Potential Effects for Impacts AQ-1 through AQ-4 and Impact AQ-9					
Alternative/ Air Basin	ROG	NO_X	CO	PM10	PM2.5	SO_2
Alternatives 1A, 2A, and 6A						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	A	NA	NA	NA	NA
Alternatives 1B, 2B, and 6B						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	NA	A	NA	NA	NA	NA
SJVAPCD	A	A	A	A	NA	NA
Alternatives 1C, 2C, and 6C						
SMAQMD	A	A	A[a]	A	A	NA
BAAQMD	A	A	A	NA	NA	NA
YSAQMD	A	A	A[a]	A	NA	NA
Alternative 3						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	A	NA	NA	NA	NA
Alternative 4						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	A	NA	NA	NA	NA
Alternatives 7 and 8						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	A	NA	NA	NA	NA
Alternative 5						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	A	NA	NA	NA	NA
Alternative 9						
SMAQMD	NA	A	NA	A	A	NA
BAAQMD	NA	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	NA	NA	NA

[a] Effect occurs in the SFNA (see Impact AQ-9).
NA = Not adverse.
A = Adverse.

Based on the data presented in Table 22-131, all alternatives would exceed one or more air district threshold and would therefore result in adverse cumulative effects on air quality in the region.

Mitigation Measures AQ-2 through AQ-4 would be available to address ROG, NO_X, and PM10 effects for some alternatives. As discussed in Section 22.3.3, no feasible measures in addition to those specified as environmental commitments would be available to further reduce PM (PM10 and PM2.5) impacts within the SMAQMD for Alternatives 1A—3 and 5—9. However, Mitigation Measure AQ-2c is available to reduce exposure of affected sensitive receptors in SMAQMD under Alternative 4 to PM10 and PM2.5 concentrations by relocating the receptors during construction. Although Mitigation Measure AQ-2c would reduce the severity of the this effect for Alternative 4, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form of exposure to substantial PM concentrations would occur at the two receptor locations near Twin Cities Road. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

The following cumulatively considerable effects would occur as a result of construction of the water conveyance facilities associated with BDCP.

- PM10 and PM2.5; SMAQMD, Alternatives 1A—3 and 5—9; Alternative 4 (if landowners do not accept DWR's offer for relocation assistance)
- CO; SJVAB, Alternatives 1B, 2B, and 6B (Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets)
- ROG and NO_X; YSAQMD, Alternatives 1C, 2C, and 6C
- ROG and NO_X; BAAQMD, Alternatives 1C, 2C, and 6C
- ROG, NO_X, and CO; SFNA and SFBAAB, Alternatives 1C, 2C, and 6C
- NO_X, SMAQMD, Alternatives 1C, 2C, and 6C
- NO_X, SMAQMD and SFNA, Alternative 9

CEQA Conclusion: Emissions generated by Alternatives 1A through 9 would exceed one or more air district threshold. As discussed above, the air district thresholds represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. Consequently, exceedances of the project-level thresholds, as identified in Table 22-131, would result in a cumulatively considerable regional air quality impact. Mitigation Measures AQ-2 through AQ-4 would be available to address ROG, NO_X, and PM10 effects for some alternatives. As discussed in Section 22.3.3, no feasible measures in addition to those specified as environmental commitments would be available to further reduce PM (PM10 and PM2.5) impacts within the SMAQMD for Alternatives 1A—3 and 5—9. Mitigation Measures AQ-2c would be available to reduce PM10 and PM2.5 impacts under Alternative 4, but not to a less-than-significant level. The BDCP proponents cannot ensure that the affected landowners will accept DWR's offer for relocation assistance. If the landowners choose not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to substantial PM concentrations would occur at the two receptor locations near Twin Cities Road. If, however, the landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

The following cumulatively considerable impacts would occur as a result of construction of the water conveyance facilities associated with BDCP.

- PM10 and PM2.5; SMAQMD, Alternatives 1A—3 and 5—9; Alternative 4 (if landowners do not accept DWR's offer for relocation assistance)

- CO; SJVAB, Alternatives 1B, 2B, and 6B (Pursuant to the general conformity regulation, section 93.158 (a)(3), general conformity cannot be satisfied for CO through the purchase of offsets)
- ROG and NO_X; YSAQMD, Alternatives 1C, 2C, and 6C
- ROG and NO_X; BAAQMD, Alternatives 1C, 2C, and 6C
- ROG, NO_X, and CO; SFNA and SFBAAB, Alternatives 1C, 2C, and 6C
- NO_X, SMAQMD, Alternatives 1C, 2C, and 6C
- NO_X,; SMAQMD and SFNA, Alternative 9

Mitigation Measure AQ-2a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2a under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-2b under Impact AQ-2 in the discussion of Alternative 1A.

Mitigation Measure AQ-2c: Relocate Sensitive Receptors to Avoid Excess Health Threats from Exposure to Particulate Matter

Please see Mitigation Measure AQ-2c under Impact AQ-2 in the discussion of Alternative 4.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-21: Cumulative Generation of Criteria Pollutants in Excess of Air District Threshold during Operation of the Water Conveyance Facility

NEPA Effects: As shown in Impacts AQ-6 through AQ-9, operation and maintenance activities under all alternatives would not exceed the air district thresholds of significance. Consequently, there would be no cumulative adverse effect to regional air quality.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed the air district thresholds for criteria pollutants. The emissions thresholds (Table 22-9) have been adopted to ensure projects do not contribute to cumulative, regional air quality impacts. Projects that do not violate the thresholds are not cumulatively considerable. The impact would be less than cumulatively considerable (i.e., less than significant). No mitigation is required.

Impact AQ-22: Expose Sensitive Receptors to Cumulative Pollutant Concentrations

NEPA Effects: The BDCP HRA analyzing construction activities found that of the 15 alternatives considered, five alternatives (1B, 2B, 4, 6B, and 9) would expose sensitive receptors to significant increases in DPM and PM2.5 pollutant concentrations in one or more air district.

Within the YSAQMD and the BAAQMD, the project-specific DPM and PM2.5 HRA found that construction of the alternatives except Alternative 4 would result in less than adverse project-specific health threats to sensitive receptors. Alternative 4 would result in considerable project-specific cancer risk in the BAAQMD during construction of the canals. Mitigation Measure AQ-13 is available to address this effect if the affected landowner chooses not to accept DWR's offer of relocation assistance. Despite this conclusion, however, there are several reasons why the project-specific DPM and PM2.5 emissions associated with all alternatives in the YSAQMD and BAAQMD would contribute to significant cumulative health threats. First, there are several proposed projects (listed in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*) that could contribute construction-related DPM and PM2.5 emissions in these air districts. In addition, existing operational emissions in these areas from on-road vehicles, boats, area sources, and stationary sources would contribute to cumulative DPM and PM2.5 concentrations. Lastly, the YSAQMD and BAAQMD do not meet existing state and/or federal PM2.5 ambient air quality standards. As a result, construction of any of the alternatives would result in an adverse cumulative contribution to pollutant concentrations at sensitive receptors within the YSAQMD and the BAAQMD.

Within the SMAQMD and the SJVAPCD, the project-specific DPM and PM2.5 modeling found that construction of five of 15 alternatives would result in considerable project-specific health threats to sensitive receptors in one or both air districts. As a result, these five alternatives—1B, 2B, 4, 6B, and 9—would contribute to adverse cumulative pollutant concentrations. Mitigation Measure AQ-12 would reduce project specific PM2.5 effects associated with Alternatives 1B, 2B, 4, and 6B. These effects would result from a concrete batch plant that would be located near existing residences.

Although Mitigation Measure AQ-12 would reduce PM2.5 effects, the PM2.5 effects for the east canal alternatives and Alternative 4 would still be cumulatively adverse based on the contribution from other existing operational emission sources.

For the remaining 11 alternatives, their contribution to cumulative health threats in SMAQMD and SJVAPCD would be adverse for the following reasons. First, there are several proposed projects (listed in Appendix 3D) that could contribute construction and/or operational DPM and PM2.5 emissions in these air districts. In addition, existing operational emissions in these areas from on-road vehicles, boats, area sources, and stationary sources would contribute to cumulative DPM and PM2.5 concentrations. Also, the SMAQMD and SJVAPCD are located in air basins that are nonattainment for PM2.5. As a result, construction of any of the alternatives would result in an adverse cumulative contribution to pollutant concentrations at sensitive receptors within the SMAQMD and SJVAPCD.

***CEQA Conclusion*:** Construction of the BDCP water conveyance features would contribute to significant cumulative health threats at sensitive receptors. Mitigation Measures AQ-12 and AQ-13 would reduce project specific PM2.5 impacts and cancer risks associated with Alternatives 1B, 2B, 4, and 6B. These impacts would result from a concrete batch plant that would be located near existing residences (east canal alternatives) and construction of the canals near the Bryon Tract Forebay (Alternative 4). Although Mitigation Measures AQ-12 and AQ-13 would reduce potential health threats, the east canal alternatives and Alternative 4 would still be cumulatively significant based on the contribution from other existing operational emission sources. Likewise, the remaining 11 alternatives would also result in a cumulative health threat due to proposed and existing projects in the study area. This impact would be significant and unavoidable.

Mitigation Measure AQ-12: Increase Distance between Batch Plant and Sensitive Receptors

Please see Mitigation Measure AQ-12 under Impact AQ-12 in the discussion of Alternative 1B.

Mitigation Measure AQ-13: Relocate Sensitive Receptors to Avoid Excess Cancer Risk from Exposure to Diesel Particulate Matter

Please see Mitigation Measure AQ-13 under Impact AQ-13 in the discussion of Alternative 4.

Impact AQ-23: Generation of Cumulative Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Implementation of the Conservation Measures 2–11 could generate additional traffic on roads and highways in and around Suisun Marsh and the Yolo Bypass related to restoration or monitoring activities. Habitat restoration and enhancement activities that require physical changes or heavy-duty equipment would generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. The intensity and frequency of vehicle trips and construction activities associated with the Conservation Measures 2–11 are assumed to be relatively minor, but could exceed local air district thresholds in the Study area. The effect would vary according to the equipment used in construction of a specific conservation measure, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation. Mitigation Measure AQ-18 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Cumulative construction and operational emissions associated with the restoration and enhancement actions could exceed applicable air district thresholds. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-9). Consequently, this impact would be cumulatively considerable and significant and unavoidable.

Mitigation Measure AQ-18: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-18 under Impact AQ-18 in the discussion of Alternative 1A.

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