significant delays in traffic, including any emergency service vehicles that may need to use SR 4 during the construction period. Construction activity associated with the Proposed Action would not alter existing service ratios, substantially affect response times, or affect other performance objectives for emergency services providers.

Because construction-related traffic would increase average daily traffic volumes on SR 4 and other local and regional roadways by only a small percentage, SR 4 already experiences heavy truck travel, and project-related construction traffic would not substantially disrupt daily traffic flow, this direct impact would be less than significant.

IMPACT 4.9-b (Alternative 1)

Long-term Increase in Traffic on Local Roadways. *Long-term operation of the new intake and pump station associated with the Proposed Action would result in a negligible increase in traffic levels associated primarily with periodic maintenance activities. This impact would be* ***less than significant.***

As described in Section 3.4.2, "Proposed Facilities," site access to the proposed intake and pump station facilities would be via SR 4 and the existing levee roads or an existing north-south dirt road located off of SR 4. The levee access roads may be surfaced with aggregate base rock to improve access during all weather conditions, but otherwise would not be modified. The north-south dirt road may be improved to accommodate two-way traffic and to meet anticipated vehicular traffic loadings.

The new intake and pump station would be operated remotely, but CCWD personnel would conduct periodic maintenance on-site. The level of traffic associated with maintenance trips (possibly a few trips per week) would be negligible in comparison with the existing roadway traffic on SR 4. During times when the pump station is in operation, the frequency of trips for maintenance and monitoring would likely increase and may occur as often as daily, also a negligible increase over existing traffic volumes. Therefore, this impact would be less than significant.

IMPACT 4.9-c (Alternative 1)

Temporary Increase in Traffic Hazards on Local Roadways Near the Project Site. *Construction-related truck traffic could interfere with the flow of traffic on SR 4, as well as track mud and gravel onto local roadways, particularly SR 4. These conditions could pose hazards for travelers on SR 4 and possibly other local roadways. This direct impact would be* ***potentially significant****.*

During the 36-month construction period, trucks delivering materials, hauling borrow material, and removing debris would be entering and exiting unpaved construction areas along SR 4, which carries substantial commuter traffic and truck traffic. The addition of construction-related truck traffic to traffic volumes on local roadways is not expected to noticeably alter traffic flow in most circumstances, although it could reduce traffic speeds along SR 4 at certain times. While this could be a minor inconvenience to motorists, there would not be any need for traffic control. No restrictions in road access, such as lane closures or blockages, would occur. However, trucks and workers entering and exiting the construction area at the beginning and end of each work day, respectively, would increase traffic hazards. At times, the presence of slow-moving trucks entering or exiting

construction areas could pose hazards to other vehicles on SR 4. In addition, trucks and other vehicles could track mud and gravel onto the local roadways, potentially posing a driving hazard. This direct impact would be potentially significant.

Cumulative Impacts

IMPACT 4.9-d (Alternative 1)

Cumulative Increase in Traffic on Local Roadways. *The project's construction-related traffic generation would be short-term and likely dispersed in different directions from the project site, and its long-term contribution to traffic increases would be negligible. The temporary increase in traffic associated with project would not make a cumulatively considerable contribution to any cumulative impact related to transportation and circulation. This impact would be* ***less than significant****.*

The geographic context for cumulative traffic impacts is the traffic network in the region, which encompasses the major roadways in Contra Costa and San Joaquin Counties. The simultaneous construction and operation of reasonably foreseeable and potentially related projects would generate increases in traffic volume on area roadways. The increase in traffic volume during construction activities for all types of cumulative projects, including road, infrastructure, and development (see Section 4.1.3, "Cumulative Impact Analysis," and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis"), would be temporary, would be dispersed throughout the counties where the projects are being implemented, and would not result in a cumulatively significant effect.

Cumulatively significant long-term increases in traffic volume would likely be associated with the travel pattern of residents living in new residential developments or workers working in new commercial or industrial developments. These individuals would likely use area roadways during the morning and afternoon peak hours to commute to and from work. Adverse cumulative traffic effects include reduction of roadway capacities, increases in traffic congestion, and driver delays.

As described above, the proposed Victoria Canal intake and pump station would be operated remotely. Vehicle trips to and from the new facility for maintenance purposes would be negligible. Therefore, the addition of daily operation-related trips would not constitute a considerable contribution to a cumulatively significant traffic impact.

In summary, traffic generation associated with construction and operation of the Proposed Action would not contribute to cumulative traffic effects. This impact would be less than significant because construction-related traffic generation would be short term and likely dispersed for all cumulative projects, and there would not be any cumulatively considerable contribution to any cumulative impact related to transportation and circulation.

Mitigation Measures

Mitigation Measure 4.9-c (Alternative 1): Prepare and Implement a Traffic Control and Safety Assurance Plan.

To reduce hazards to vehicles on local roadways, CCWD shall ensure that the construction contractor prepares and implements a traffic control and safety assurance

plan for project-affected roadways and intersections in the project area. The plan shall be submitted to the local public agency with jurisdiction over local transportation issues (e.g., public works department) for review before the initiation of construction-related activities. The plan shall include the following elements:

- Provide flagger control at the access roads to the project site from SR 4 to manage traffic control and flows as necessary during periods of heavy project construction-related truck traffic.
- Maintain access for emergency vehicles at all times. Provide pre-notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on SR 4.
- Post advance warnings about the potential presence of slow-moving vehicles on SR 4, as appropriate.
- Place and maintain barriers and install traffic control devices necessary for safety, as specified in Caltrans' Traffic Controls for Construction and Maintenance Work Zones and in accordance with the guidance provided by the affected local jurisdictions.
- Limit the accumulation of project-generated mud or dirt on SR 4. Actions may include using wheel-washers or installing gravel beds at exit points from unpaved roads onto SR 4 to remove soil buildup on tires and reduce track-out.
- Train construction personnel in appropriate safety measures as described in the plan.

Implementing this mitigation measure would reduce the potentially significant impact related to construction-related traffic hazards to a less-than-significant level.

4.9.2.5 Alternative 2, Indirect Pipeline Alternative

The direct and cumulative impacts of Alternative 2 would be the same as described for the Proposed Action because the project-generated construction and long-term traffic would be very similar. The same mitigation measure described for the Proposed Action would apply to Alternative 2 to reduce the potential for hazards to vehicles on local roadways to a less-than-significant level.

4.9.2.6 Alternative 3, Modified Operations Alternative

The direct and cumulative impacts of Alternative 3 would be the same as those described above for the Proposed Action. The same mitigation measure described for the Proposed Action would apply to Alternative 3 to reduce the potential for hazards to vehicles on local roadways to a less-than-significant level.

4.9.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.9-a (Alternative 4)

Temporary Increase in Traffic on Local Roadways. *During the estimated 30- to 36-month construction period, commute trips and haul truck trips would increase traffic on local roadways in the vicinity of the Desalination Alternative project sites, primarily SR 4, Port Chicago Highway, and Willow Pass Road. However, this temporary traffic increase would not be considered substantial in relation to current traffic levels, and the traffic increase would not significantly alter existing traffic patterns or congestion. This impact would be* ***less than significant****.*

This impact would be similar to Impact 4.9-a (Alternative 1), described above, as project-generated construction traffic levels for the Desalination Alternative would be similar to the levels described for the Proposed Action. The construction duration, construction activities (and, thus, the number of haul truck trips), and construction labor force (and, thus, commuter trips) anticipated for the Desalination Alternative would all be comparable to those described for the Proposed Action. However, unlike construction under the Proposed Action, construction of facilities under the Desalination Alternative would be spread over several miles, with some activities occurring at the Mallard Slough facility site in Bay Point, others at and near the Concord Bollman WTP site, and installation of the untreated-water conveyance pipeline occurring over several miles in between. The work force and construction activity would therefore be dispersed among multiple sites. The major affected roadways for the Desalination Alternative would mainly be SR 4, Port Chicago Highway, and Willow Pass Road in the vicinity of the Desalination Alternative project sites and local streets adjacent to the pipeline construction zones.

For this analysis, a maximum traffic volume of 150 round trips per day (including construction worker commute trips) is used; however, as discussed above, there are multiple construction sites under this alternative and construction traffic would be dispersed across these sites during the estimated 36-month construction period. Most of the project construction traffic (worker commute and materials delivery) is anticipated to be concentrated at Bollman WTP and the Mallard Slough facility site. Installation of the untreated-water conveyance pipeline and concentrate disposal pipeline would be linear and therefore would likely not affect traffic in any one area for more than a few weeks.

Average daily traffic volumes on Bates Avenue at the Bollman WTP and Port Chicago Highway at the intersection with Bates Avenue are 6,557 and 21,005, respectively (City of Concord 2005). The addition of a maximum of 150 daily trips on Bates Avenue at the Bollman WTP (very conservative estimate) would constitute a total traffic increase of about 2% over the average daily volume (150/6,557 existing trips). Similarly, project trips on Port Chicago Highway at the intersection with Bates Avenue would constitute a total traffic increase of about 0.7% (very conservative estimate) over the average daily volume (150/21,005 existing trips). This increase in traffic would not substantially disrupt daily traffic flow on Bates Avenue and Port Chicago Highway in the vicinity of the Bollman WTP, where project-related traffic would likely be the most concentrated, or on other regional or local roadways.

Because of the temporary nature of construction-generated traffic and the relatively minor increase (relative to existing conditions) in traffic volumes on individual local roadways in the vicinity of the Desalination Alternative project sites, project-generated construction traffic would not substantially disrupt daily traffic flow on these roadways. This impact would therefore be less than significant.

IMPACT 4.9-b (Alternative 4)

Long-term Increase in Traffic on Local Roadways. *Long-term operation of the Desalination Alternative facilities would result in a small increase in traffic levels associated with the minimal addition of new staff at the Bollman WTP and periodic maintenance activities. This direct impact would be* ***less than significant****.*

The new intake and pump station at Mallard Slough would be operated remotely. Similarly, the new untreated-water pipeline and new concentrate disposal pipeline would not require the addition of new staff. CCWD personnel would conduct periodic maintenance on-site for these new facilities. The level of traffic associated with new maintenance trips to the Mallard Slough facility (possibly a few trips per week) would be negligible in comparison with the existing roadway traffic on area roadways. During times when the pump station is in operation, the frequency of maintenance trips to the Mallard Slough facility would likely increase and may occur as often as daily. However, these trips would not substantially increase traffic levels on local roadways in relation to existing conditions.

The new desalination treatment facility would operate 24 hours a day, averaging 5 months of use per year, and may require an increase of fewer than 10 staff at the Bollman WTP. Assuming two total trips per day per employee (assuming an 8-hour shift), operation of the facility would result in a maximum of approximately 60 additional one-way trips per day. Because of the low level of project-generated traffic volumes, this alternative would not result in a substantial increase in average daily traffic levels. Therefore, this direct impact would be less than significant.

IMPACT 4.9-c (Alternative 4)

Temporary Traffic Delays and Access Restrictions, Including Potential Delays in Emergency Vehicle Response Times. *Construction of the Desalination Alternative (specifically, installation of the new untreated-water conveyance pipeline) would increase short-term traffic delays for vehicles traveling past the construction areas and restrict access to adjacent uses on roadways where new facilities would be installed. This impact would be* ***potentially significant****.*

The new untreated-water conveyance pipeline alignment would pass through private property as well as public road rights-of-way in the communities of Bay Point and Clyde. Pipeline construction activities along local roadways would temporarily disrupt transportation and circulation patterns in the vicinity of work zones. Impacts would include direct disruption of traffic flows and street operations through lane closures and/or blockages, which would reduce travel lanes and curbside parking and could result in delays for vehicles traveling past the construction zone. Where pipeline installation would be on narrow residential streets, temporary street closures would be necessary. In addition, construction would temporarily restrict access to adjacent land uses (e.g.,

residences) for vehicles, pedestrians, and bicycles. If emergency vehicles require passage, disruptions in circulation could increase emergency response times and otherwise make access to the area more difficult for emergency service providers.

Most of the roads followed by the pipeline alignment are local roads where traffic volumes would likely be low. Where the pipeline alignment would cross heavily traveled arterial roads (e.g., Willow Pass Road and Port Chicago Highway), lane closures may be necessary and would likely result in more traffic congestion and longer delays. Because of the temporary nature of construction activities, any traffic delays and access restrictions would also be temporary. In addition, construction of the Desalination Alternative would occur over an approximately 36-month construction period, with construction of the untreated-water conveyance pipeline extending for about 10–12 months. It is anticipated that pipeline construction would be phased, with some portions possibly overlapping, such that not all areas would be affected at the same time. However, in the absence of traffic control measures, this temporary direct impact would be potentially significant.

IMPACT 4.9-d (Alternative 4)

Temporary Increase in Traffic Hazards on Local Roadways Near Construction Areas. *Construction activity, construction traffic, and the presence of construction equipment could create hazardous conditions on arterials and local streets in Bay Point, Clyde, and Concord where the untreated-water pipeline would be installed. This direct impact would be* ***significant****.*

The construction duration, construction activities (and, thus, the number of haul truck trips), and construction labor force (and, thus, commuter trips) anticipated for the Desalination Alternative would all be comparable to those described for the Proposed Action. However, construction under this alternative would be spread over a larger area and has the potential to affect conditions on numerous arterials and local streets in Bay Point, Clyde, and Concord both through the presence of slow-moving trucks and construction equipment and through the disruption of traffic flow caused by the installation of pipeline within existing roadways. This direct impact would be significant.

IMPACT 4.9-e (Alternative 4)

Temporary Disruptions to Rail Operations. *The alignments of the new untreated-water conveyance and concentrate disposal pipelines would cross several rail lines. Tunneling techniques would be used to install pipelines under railroad tracks, and coordination with the applicable railroad operators would ensure continued operation of rail service. This impact would be* ***less than significant****.*

Construction of the new pipelines associated with the Desalination Alternative would necessitate crossing the existing railroad track rights-of-way. The new untreated-water conveyance pipeline alignment would parallel the Union Pacific System railroad tracks and cross the Union Pacific, Atchison Topeka & Santa Fe, and Southern Pacific Transportation Company railroad tracks in the Bay Point area. The new concentrate disposal pipeline would cross under the Union Pacific and Burlington Northern Santa Fe Railroad tracks.

Tunneling techniques would be used for pipeline installation under railroad tracks, and CCWD and/or the construction contractor would coordinate with the applicable railroad operators regarding minimum setback of the construction zone (specifically, jack-and-bore pits) from the railroad to ensure continued operation of rail service. This impact would be less than significant.

IMPACT 4.9-f (Alternative 4)

Temporary Disruptions to Transit Service. *Installation of the new untreated-water conveyance pipeline may result in temporary disruptions to transit service along the pipeline corridor (i.e., bus service delays). This temporary impact would be* ***potentially significant****.*

Several transit routes are located along or adjacent to the corridor for the new untreated-water conveyance pipeline. Several Tri-Delta bus lines cross the new untreated-water pipeline corridor at Willow Pass Road in Bay Point, and CCCTA bus lines are located near the pipeline corridor in Concord. Public transit service could be disrupted during construction activities in these areas, primarily resulting from traffic delays associated with construction of the pipeline within local roadways. This impact would be potentially significant.

Cumulative Impacts

IMPACT 4.9-g (Alternative 4)

Cumulative Increase in Traffic on Local Roadways. *The project's construction-related traffic generation would be short-term and dispersed, and its long-term contribution to traffic increases would be negligible. The temporary increase in traffic associated with project construction would not make a cumulatively considerable contribution to any cumulative impact related to transportation and circulation. This impact would be* ***less than significant****.*

The geographic context for cumulative traffic impacts is the traffic network in the region, which encompasses the major roadways in Contra Costa and San Joaquin counties. The simultaneous construction and operation of reasonably foreseeable and potentially related projects would generate increases in traffic volume on area roadways. The increase in traffic volume during construction activities for all types of cumulative projects, including road, infrastructure, and development (see Section 4.1.3, "Cumulative Impact Analysis," and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis"), would be temporary, would be dispersed throughout the region, and would not result in a cumulatively significant effect.

Cumulatively significant long-term increases in traffic volume would likely occur associated with the travel pattern of residents living in new residential developments or workers working in new commercial or industrial developments. These individuals would likely use area roadways during the morning and afternoon peak hours to commute to and from work. Adverse cumulative traffic effects include reduction of roadway capacities, increases in traffic congestion, and driver delays. As described above, the expanded Mallard Slough intake and pump station would be operated remotely. Fewer than 10 new employees would be associated with the operation of the new desalination treatment facility at the Bollman WTP. Additional vehicle trips to and from these facilities would

be negligible under project operation. Therefore, the addition of daily operation-related trips would not constitute a considerable contribution to a cumulatively significant traffic impact.

In summary, traffic generation associated with construction and operation of the Desalination Alternative would likely contribute to cumulative traffic effects during construction of certain facilities, primarily portions of the new untreated-water pipeline, if other construction projects are being conducted at the same time within the same local areas (see Section 4.1.3, "Cumulative Impact Analysis," and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis"). Construction-related traffic generation would be short term and dispersed for this project and all cumulative projects, however, and the contribution of the Desalination Alternative to any cumulative impact related to transportation and circulation would not be cumulatively considerable. This impact would be less than significant.

Mitigation Measures

Mitigation Measure 4.9-c (Alternative 4): Prepare and Implement a Traffic Control and Safety Assurance Plan.

This mitigation measure is similar to Mitigation Measure 4.9-c (Alternative 1) described for the Proposed Action.

To reduce potential traffic congestion issues and hazards to vehicles on local roadways, CCWD shall ensure that the construction contractor prepares and implements a traffic control and safety assurance plan for project-affected roadways and intersections in the construction zones. The plan shall be submitted to the appropriate local public agency, as appropriate, for review before the initiation of construction-related activities. The plan shall include the following elements:

- To the extent feasible, limit the construction work zone in each block to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone.
- Provide flagger control at construction zones to manage traffic control and flows as necessary.
- Install temporary steel-plate trench crossings, as needed, to maintain reasonable traffic, bicycle, and pedestrian access to homes, businesses, and streets.
- Maintain access for emergency vehicles at all times. Provide pre-notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on local roadways.
- Post advanced warning of construction activities (for any affected roadways that would be closed or major roadways where lane closures would occur) in the local newspaper(s) and/or coordinate with the local jurisdictions to post such warnings in highly visible locations near the affected roadways.

- Post advance warnings about the potential presence of slow-moving vehicles in construction zones, where needed to reduce potential traffic hazards.
- Place and maintain barriers and install traffic control devices necessary for safety, as specified in Caltrans' Traffic Controls for Construction and Maintenance Work Zones and in accordance with the guidance provided by the affected local jurisdictions.
- Limit the accumulation of project-generated mud or dirt on roadways adjacent to construction areas. The construction contractor shall sweep the affected paved roadways (water sweeper with reclaimed water recommended) at the end of each day if substantial volumes of soil material have been carried onto adjacent paved, public roads from construction sites.
- Train construction personnel in appropriate safety measures as described in the plan.

Preparation and implementation of a traffic control and safety assurance plan would reduce potentially significant temporary traffic delays and access restrictions to less-than-significant levels.

Mitigation Measure 4.9-d (Alternative 4): Prepare and Implement a Traffic Control and Safety Assurance Plan.

This mitigation measure is the same as Mitigation Measure 4.9-c (Alternative 4). Preparation and implementation of a traffic control and safety assurance plan would reduce potentially significant temporary traffic hazards to a less-than-significant level.

Mitigation Measure 4.9-f (Alternative 4): Coordinate with Transit Providers to Ensure That Disruption of Public Transit Service is Minimized.

CCWD shall coordinate with private and public transit providers in all jurisdictions where construction activity could directly block transit routes or result in transit delays. Coordination shall include providing notification at least 2 weeks in advance of any such activity that could disrupt or delay regularly scheduled transit service. CCWD shall cooperate with the affected service providers to minimize disruptions and delays during the periods of peak use to the extent feasible.

This coordination would reduce potentially significant temporary impacts to public transit service to a less-than-significant level.

4.10 Air Quality

This section includes a summary of air quality regulations that may apply to the Proposed Action and alternatives, a description of existing air quality conditions in the project areas, and an analysis of potential short- and long-term air quality impacts that could result from project implementation. The method of analysis is consistent with the recommendations of the Bay Area Air Quality Management District (BAAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD). Mitigation measures are recommended, as necessary, to reduce potentially significant air quality impacts.

4.10.1 Affected Environment

The proposed project site is located in Contra Costa and San Joaquin Counties, and the Desalination Alternative project sites are located in Contra Costa County. The BAAQMD and the SJVAPCD are the primary agencies with responsibility for air quality regulation in Contra Costa County and San Joaquin County, respectively. Contra Costa County is within the San Francisco Bay Air Basin (SFBAB), which also comprises all of Alameda, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, the western portion of Solano County, and the southern portion of Sonoma County. San Joaquin County is within the San Joaquin Valley Air Basin (SJVAB), which also comprises all of Fresno, Kings, Madera, Merced, Stanislaus, and Tulare Counties, and the western portion of Kern County.

4.10.1.1 Regulatory Setting

Criteria Air Pollutants

Federal, State, and local air quality agencies, as discussed separately below, focus on the following air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Because these are the most prevalent air pollutants known to be harmful to human health and extensive documentation on health-effects criteria is available for these pollutants, they are commonly referred to as "criteria air pollutants."

Federal Plans, Policies, Regulations, and Laws

At the Federal level, the U.S. Environmental Protection Agency (EPA) implements national air quality programs. The EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (CAA), which was enacted in 1963 and amended in 1970, 1977, and 1990.

As required by the CAA, the EPA has established primary and secondary national ambient air quality standards (NAAQS) for the following criteria air pollutants: ozone, CO, NO_2, SO_2, respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead (see Table 4.10-1). The primary and secondary standards protect public health and

welfare, respectively. The CAA also required each State to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The Federal Clean Air Act Amendments (CAAA) added requirements for States with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution.

The SFBAB and the SJVAB have been found to be in nonattainment with the Federal standards for certain pollutants. The BAAQMD and the SJVAPCD have prepared plans to address these pollutants within their jurisdictions to support the SIP, as described below.

State Plans, Policies, Regulations, and Laws

The California Air Resources Board (ARB) is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). As required by the CCAA, which was adopted in 1988, the ARB has established California ambient air quality standards (CAAQS) for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the abovementioned criteria air pollutants (see Table 4.10-1). In most cases, the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

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

Table 4.10-1
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [2]		
		Standards [1, 3]	Attainment Status (County) [9]	Primary [3,4]	Secondary [3,5]	Attainment Status [10]
Ozone[6]	1-hour	0.09 ppm (180 µg/m^3)	N	0.12 ppm (235 µg/m^3)	Same as Primary Standard	N
	8-hour	0.07 ppm (137 µg/m^3)	N/A	0.08 ppm (157 µg/m^3)		N
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.25 ppm (470 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U

Table 4.10-1
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [2]		
		Standards [1, 3]	Attainment Status (County) [9]	Primary [3,4]	Secondary [3,5]	Attainment Status [10]
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3 *	N	50 µg/m^3 [6]	Same as Primary Standard	U (Contra Costa) N (San Joaquin)
	24-hour	50 µg/m^3		150 µg/m^3 [6]		
Fine Particulate Matter ($PM_{2.5}$)[7]	Annual Arithmetic Mean	12 µg/m^3*	N	15 µg/m^3	Same as Primary Standard	N/A
	24-hour	–	–	65 µg/m^3		
Lead [8]	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	
Sulfates	24-hour	25 µg/m^3	A	No Federal Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride[7]	24-hour	0.01 ppm (26 µg/m^3)	U/A			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

[1] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current Federal policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a

Table 4.10-1
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [2]		
		Standards [1, 3]	Attainment Status (County) [9]	Primary [3,4]	Secondary [3,5]	Attainment Status [10]

reference temperature of 25°C and a reference pressure of 760 torr; parts per million (ppm) in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[5] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[6] New Federal 8-hour ozone and fine particulate matter standards were promulgated by EPA on July 18, 1997.

[7] On June 20, 2002, ARB approved staff recommendation to revise the PM_{10} annual average standard to 20 $\mu g/m^3$ (micrograms per cubic meter) and to establish an annual average standard for $PM_{2.5}$ of 12 $\mu g/m^3$. These standards took effect on July 5, 2003. Information regarding these revisions can be found at http://www.arb.ca.gov/research/aaqs/std-rs.htm.

[8] ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[9] The attainment status is the same for San Joaquin and Contra Costa Counties. Definitions:
Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the State standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a State standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

[10] The attainment status is the same for San Joaquin and Contra Costa Counties, except where noted. Definitions:
Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

Source: California Air Resources Board 2005b, U.S. Environmental Protection Agency 2005

Local Plans, Policies, Regulations, and Laws

Bay Area Air Quality Management District

The BAAQMD attains and maintains air quality conditions in Contra Costa County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues.

In December 1999, the BAAQMD released its revised CEQA Guidelines (BAAQMD 1999), a revision of a previously adopted guideline document. The revised CEQA Guidelines is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. With respect to applicable air quality plans, the BAAQMD prepared the *2001 Ozone Attainment Plan* for the national 1-hour ozone standard to address nonattainment of this standard in the SFBAB. The document included two commitments for further planning: (1) a commitment to conduct a mid-course review of progress toward attaining the national 1-hour ozone standard by December 2003, and (2) a commitment to provide a revised ozone attainment strategy to EPA by April 2004.

In April 2004, the EPA made a final finding that the SFBAB has attained the national 1-hour ozone standard. Because of this finding, the BAAQMD's previous planning

commitments in the *2001 Ozone Attainment Plan* are no longer required. However, the finding of attainment does not mean the SFBAB has been reclassified as an attainment area for the 1-hour standard. The BAAQMD must submit a redesignation request to EPA to be reclassified as an attainment area. Consequently, the BAAQMD is currently preparing the Bay Area Ozone Strategy, which will address national and State air quality planning requirements. In addition, the CCAA requires the BAAQMD to update the Clean Air Plan for attaining the State 1-hour ozone standard every 3 years.

Construction activities within Contra Costa County must comply with all applicable BAAQMD rules and regulations, including Regulation 2 (Permits) and Regulation 6 (Particulate Matter and Visible Emissions) (BAAQMD 1999).

San Joaquin Valley Air Pollution Control District
The SJVAPCD attains and maintains air quality conditions in San Joaquin County in a manner similar to that of the BAAQMD, as discussed above.

In January 2002, the SJVAPCD released its *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2002), a revision to a previously adopted guidelines document. This guide serves as an advisory document and contains types of information similar to those in the BAAQMD CEQA Guide.

With respect to the applicable air quality plans, the SJVAPCD most recently adopted the *2004 Extreme Ozone Attainment Demonstration Plan*, which included the CCAA triennial progress report and plan revision, and the 2003 PM_{10} Plan. In coordination with the ARB and other air districts, the SJVAPCD has begun preliminary work on developing the *8-hour Ozone Attainment Demonstration Plan*. In addition, the SJVAPCD is currently developing the *2005 Amendments to the 2003 PM_{10} Plan* and the *2006 PM_{10} Plan*.

Project construction activities in San Joaquin County must comply with all applicable SJVAPCD rules and regulations, including SJVAPCD Regulation II (Permits) and Regulation VIII (Fugitive PM_{10}). The purpose of Regulation VIII is to reduce ambient concentrations of fine particulate matter by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions (SJVAPCD 2004).

Toxic Air Contaminants

Toxic air contaminants (TACs), or, in Federal parlance, hazardous air pollutants (HAPs), are defined as air pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are not considered criteria air pollutants and thus are not specifically addressed through the setting of ambient air quality standards. Instead, the EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum available control technology (MACT) or best available control technology (BACT) to limit emissions. These, in conjunction with additional rules set forth by the BAAQMD and the SJVAPCD, establish the regulatory setting for TACs. For example, emissions of the TAC diesel particulate matter (diesel PM) would be associated with the Proposed Action and alternatives, and would be subject to the applicable regulatory programs as discussed further below.

Federal Hazardous Air Pollutant Programs
Title III of the CAA requires the EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may be different for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources.

The CAAA requires EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum for benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1, 3-butadiene. In addition, Section 219 requires the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

State and Local Toxic Air Contaminant Programs
California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807 of 1984) (Tanner Act) and the Air Toxics Hot Spots Information and Assessment Act (AB 2588 of 1987) (Hot Spots Act). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified over 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, the ARB then adopts an Airborne Toxics Control Measure (ACTM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under SJVAPCD Rule 2010 and BAAQMD Regulation 2-Rule 1 (Permit Requirements), SJVAPCD Rule 2201 and BAAQMD Regulation 2-Rule 2 (New and Stationary Source Review), and SJVAPCD Rule 2520 (Federally Mandated Operating Permit), all stationary sources that possess the potential to emit TACs are required to obtain permits from the applicable district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The SJVAPCD and BAAQMD limit emissions and public exposure to TACs through a number of programs. Both districts prioritize TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Odors
The SJVAPCD's Rule 4102 (Nuisance) addresses odor exposure in the SJVAB. Rule 4102 states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or to the public, or which endanger the comfort,

repose, health, or safety of any such persons, or that public, or which cause to have a natural tendency to cause injury or damage to business or property.

The BAAQMD's Regulation 7 (Odorous Substances) addresses odor exposure in the SFBAB. Regulation 7 generally limits the discharge of odorous substances based on dilution rates.

4.10.1.2 Environmental Setting

Air quality in the SFBAB and SJVAB is determined by such natural factors as topography, climate, and meteorology, in addition to the presence of existing air pollution sources and ambient conditions. These factors are discussed below.

Topography, Climate, and Meteorology

The SFBAB and SJVAB are characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. In this area, the Coast Range splits, resulting in the western (Golden Gate) coast gap and the eastern (Carquinez Strait) coast gap. These gaps allow air to flow in and out of the SFBAB and SJVAB. Air flows into the project area through the Carquinez Strait, moving across the Sacramento–San Joaquin River Delta, and transporting pollution from the Bay Area. Regional flow patterns affect air quality patterns by moving pollutants downwind of sources. Localized meteorological conditions, such as moderate winds, disperse pollutants and reduce pollutant concentrations. An inversion layer develops when a layer of warm air traps cooler air close to the ground. Such temperature inversions hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground. During summer mornings and afternoons, these inversions are present over the project area. During summer's longer daylight hours, plentiful sunshine provides the energy needed to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_x), which result in ozone formation.

Local meteorology of the project area is represented by measurements recorded at the Antioch and Stockton stations. The normal annual precipitation, which occurs primarily from November through March, is approximately 13 inches. January temperatures range from a normal minimum of 36°F to a normal maximum of 53°F. July temperatures range from a normal minimum of 56°F to a normal maximum of 91°F (National Oceanic and Atmospheric Administration 1992). The predominant wind direction and speed is from the northwest at 10 miles per hour (mph) (California Air Resources Board 1994).

Existing Air Quality

Criteria Air Pollutants

Regulatory agencies primarily focus on the criteria air pollutants as indicators of ambient air quality (i.e., ozone, CO, NO_2, SO_2, PM, and lead). A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below, along with the most current area designations and monitoring data for the project areas.

Ozone
Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_x in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_x are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

Ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Emissions of ozone precursors have decreased in the SFBAB over the past several years due to more stringent motor vehicle standards, cleaner burning fuels, and stationary source emission controls. Consequently, peak 1-hour and 8-hour ozone concentrations in the SFBAB have declined overall by about 21% during the last 20 years. However, the SFBAB can be identified as a transport contributor of pollutants to other air basins such as the SJVAB (California Air Resources Board 2005a). Emissions of ozone precursors have declined in the SJVAB from mobile and stationary sources as well; however, the ozone problem in the San Joaquin Valley ranks among the most severe in the State. This is because the SJVAB is identified as both a receptor of pollutants transported from the SFBAB and a contributor of pollutants within itself (California Air Resources Board 2005a).

Carbon Monoxide
CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (U.S. Environmental Protection Agency 2005). The highest concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to ozone, which is considered a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide
NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made 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 2005). The combined emissions of NO and NO_2 are referred to as NO_x, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_x emission sources. Inhalation is the most common route of

exposure to NO_2. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure.

Sulfur Dioxide
SO_2 is produced by such stationary sources as coal and oil combustion, 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 with constriction of the bronchioles occurring with inhalation of SO_2 at 5 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.

Particulate Matter
Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (U.S. Environmental Protection Agency 2005). $PM_{2.5}$ includes a subgroup of finer particles that have an aerodynamic diameter of 2.5 micrometers or less (California Air Resources Board 2005a).

Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (U.S. Environmental Protection Agency 2005). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

In addition to health effects, fugitive dust can also pose a nuisance to agriculture because emissions of fugitive dust can result in the transmission of dust to nearby agricultural crops. Based on available information, the application of standard construction mitigation measures for the control of fugitive dust (e.g., the application of water or soil stabilizers) is an effective method of reducing dust-related impacts on agricultural crops.

Direct emissions of both PM_{10} and $PM_{2.5}$ increased in the SFBAB between 1975 and 2000 and are projected to increase through 2020. Direct emissions of $PM_{2.5}$ in the SJVAB decreased between 1975 and 2000 but are projected to increase through 2020, while emissions of PM_{10} are showing a downward trend. This decrease could be attributed to meteorology or incomplete monitoring network data. These emissions are dominated by area-wide sources, primarily due to development. Direct emissions of PM from mobile and stationary sources have remained relatively steady (California Air Resources Board 2005a).

Lead
Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline metal processing is currently the primary source of lead emissions. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Because the Proposed Action and alternatives would not involve any sources of lead emissions, this pollutant is not discussed further in this study.

Criteria Air Pollutant Concentrations
Criteria air pollutant concentrations are measured at several monitoring stations in the SJVAB and SFBAB. The Tracy-24371 Patterson Pass Road and Bethel Island Road stations are the closest in proximity to the project sites with recent data for ozone, PM_{10}, and $PM_{2.5}$. In general, the ambient air quality measurements from these stations are representative of the air quality in the project area. Table 4.10-2 summarizes the air quality data from the most recent 3 years.

Both ARB and EPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations with respect to the project area are shown in Table 4.10-1 for each criteria air pollutant.

Toxic Air Contaminants
The presence of TACs is also an indicator of air quality conditions. TACs usually exist in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (see Table 4.10-1).

According to the *2005 California Almanac of Emissions and Air Quality* (California Air Resources Board 2005a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM

Table 4.10-2
Summary of Annual Ambient Air Quality Data (2002–2004)[3]

	2002	2003	2004
OZONE			
State standard (1-hr avg, 0.09 ppm) National standard (1-hr/8-hr avg, 0.12/0.08 ppm)			
Maximum concentration (1-hr/8-hr avg, ppm)	0.107/ 0.096	0.103/ 0.089	0.109/ 0.097
Number of days State standard exceeded 1-hr	11	5	4
Number of days national 1-hr/8-hr standard exceeded	0/3	0/2	0/1
CARBON MONOXIDE			
State standard (8-hr avg, 9.1 ppm) National standard (8-hr avg, 9.5 ppm)			
Maximum concentration (8-hr avg, ppm)	1.30	0.89	0.91
Number of days State standard exceeded	0	0	0
Number of days national standard exceeded	0	0	0
FINE PARTICULATE MATTER ($PM_{2.5}$)			
No separate State standard National standard (24-hr avg, 65 $\mu g/m^3$)			
Maximum concentration 4 ($\mu g/m^3$)	64.0	45.0	41.0
Number of days national standard exceeded (measured [2])	0	0	0
RESPIRABLE PARTICULATE MATTER (PM_{10})			
State standard (24-hr avg, 50 $\mu g/m^3$) National standard (24-hr avg, 150 $\mu g/m^3$)			
Maximum concentration 4 ($\mu g/m^3$)	61.2	51.3	42.3
Number of days State standard exceeded (calculated [1])	3	1	0
Number of days national standard exceeded (calculated [1])	0	0	0

[1] Measured days are those days that an actual measurement was greater than the level of the State daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

[2] The number of days a measurement was greater than the level of the national daily standard. Measurements are collected every day, every 3 days, or every 6 days, depending on the time of year and the site's monitoring schedule. The number of days above the standards is not directly related to the number of violations of the standard for the year.

[3] Measurements for ozone are from the Tracy-24371 Patterson Pass Road station, for $PM_{2.5}$ are from the Stockton-Hazelnut Street station, and for CO and PM_{10} are from Bethel Island Road station.

[4] State of California measurements.

Source: California Air Resources Board 2005b

is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, the ARB has made preliminary concentration estimates based on a PM exposure method. This method uses ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies on chemical speciation to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,

3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risk, for which data are available, in California.

Diesel PM poses the greatest health risk among the ten TACs mentioned. Based on receptor modeling techniques, the ARB estimated its health risk to be 480 excess cancer cases per million people in the SFBAB in the year 2000. Since 1990, the diesel PM's health risk has been reduced by 36%. Overall, levels of most TACs have gone down since 1990 except for para-dichlorobenzene and formaldehyde (California Air Resources Board 2005a).

4.10.2 Environmental Consequences

4.10.2.1 Methods and Assumptions

Short-term construction emissions of PM_{10} are qualitatively discussed, while emissions of ROG and NO_x along with long-term operational emissions of ROG, NO_x, and PM_{10} were calculated using recommended methodologies from SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2002), BAAQMD's CEQA Guidelines (BAAQMD 1999), SMAQMD's Construction Model 5.1 (SMAQMD 2003), and EMFAC2002 Version 2.2 computer model (California Air Resources Board 2002). Short-term increases in pollutants were compared with applicable SJVAPCD and BAAQMD thresholds for determination of significance.

The analysis of all other air quality impacts was conducted in accordance with the recommended methodologies identified by the SJVAPCD and BAAQMD.

4.10.2.2 Significance Criteria

For the purpose of this analysis, the following applicable thresholds of significance, as identified by the BAAQMD and SJVAPCD or by the State CEQA Guidelines (Appendix G), have been used to determine whether implementation of the Proposed Action or alternatives would result in a potentially significant air quality impact. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects.

Generation of Short-Term Construction Criteria Air Pollutant Emissions

The BAAQMD emphasizes implementation of effective and comprehensive control measures rather than requiring a detailed quantification of construction emissions. However, if effective and comprehensive control measures are implemented as appropriate, then short-term construction impacts would be reduced to a less-than-significant level. These mitigation measures would prevent the project from resulting in or substantially contributing to emissions concentrations (e.g., ROG, NO_x, and PM_{10}) that exceed the NAAQS and CAAQS. The SJVAPCD's approach is similar for PM_{10} emissions. Complying with SJVAPCD Regulation VIII would reduce impacts to a less-than-significant level (e.g., limit Visible Dust Emissions [VDE] to 20% opacity level). However, if construction emissions of ozone precursors (ROG and NO_x) exceed 10 TPY, then the project would result in a potentially significant impact.

Generation of Long-Term Operational (Regional) Criteria Air Pollutant Emissions

Regional impacts would be considered significant if implementation of the project would result in emissions of ROG, NO_x, or PM_{10} that exceed BAAQMD or SJVAPCD thresholds (15 TPY of ROG, NO_x, and PM_{10} and 10 TPY of ROG and NO_x, respectively). In addition, regional impacts would be considered significant if the project would result in or substantially contribute to emissions concentrations (e.g., PM_{10}) that exceed the NAAQS and CAAQS.

Generation of Long-Term Operational (Local) Mobile-Source Carbon Monoxide Emissions

Local CO impacts would be considered significant if project implementation would result in or substantially contribute to CO concentrations that exceed the California 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm.

Toxic Air Contaminant Impacts

Toxic air contaminant impacts would be considered significant if project implementation would result in the exposure of sensitive receptors to toxic air contaminant emissions that exceed 10 in 1 million for the Maximally Exposed Individual (MEI) (one in one million if Best Available Control Technology [BACT] is not applied), or a Hazard Index (HI) of one.

Odor Impacts

Odor impacts would be considered significant if project implementation would result in excessive nuisance odors, as defined under the California Code of Regulations, Health & Safety Code Section 41700, "Air Quality Public Nuisance."

4.10.2.3 No-Action Alternative

Under the No-Action Alternative, no new intake, conveyance, or desalination facilities would be constructed. Therefore, the No-Action Alternative would have no impact associated with air pollutant or odorous emissions. Other projects would likely result in cumulative increases in air quality and odorous emissions in the project area associated with increased traffic and development, but the No-Action Alternative would make no contribution to these emissions. Therefore, the No-Action Alternative would have no direct, indirect, or cumulative impact on air quality.

4.10.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.10-a (Alternative 1)

Generation of Short-Term Construction Criteria Air Pollutant Emissions. *Construction of the intake, pump station, conveyance pipeline, and associated infrastructure would temporarily generate ROG, NO_x, and PM_{10} emissions. ROG and NO_x emissions could potentially contribute to existing nonattainment conditions with respect to ozone and further degrade air quality. This direct impact would be* ***significant****.*

Construction of the intake, pump station, conveyance pipeline, and associated infrastructure would result in the temporary generation of ROG, NO_x, and PM_{10}

emissions from excavation for pipeline trenching, concrete foundations, paving, motor vehicle exhaust associated with construction equipment, construction employee commute trips, material transport (especially on unpaved surfaces), and other construction activities.

Construction-generated emissions of ozone precursors ROG and NO_x were calculated for construction equipment and worker vehicle commute trips using EMFAC2002 emissions factors as contained in Construction Model Version 5.1. The specific pieces of construction equipment and durations of their use would be determined by the contractor based on numerous factors and thus are not known at this time; therefore, the calculations were performed using assumptions for equipment operation recommended by the SJVAPCD for similar types of projects. Modeled project-generated emissions for ROG, NO_x, and PM_{10} would be 5 TPY, 34 TPY, and 2 TPY, respectively. The model results for NO_x emissions exceed the SJVAPCD significance threshold of 10 TPY for construction.

Under BAAQMD and SJVAPCD guidelines, construction emissions of PM_{10} would be considered less than significant if the BAAQMD and SJVAPCD construction control mitigation measures for PM_{10} are included as part of the project. Because these control mitigation measures have not been incorporated into the Proposed Action, project-related construction emissions of PM_{10} are considered to be significant as well.

Consequently, because of the existing nonattainment status of the project area with respect to ozone and PM_{10}, construction of the Proposed Action could further degrade air quality and also contribute to nonattainment conditions. As a result, this impact would be significant.

IMPACT 4.10-b (Alternative 1)

Generation of Long-Term Operational (Regional) Criteria Air Pollutant Emissions. *The Proposed Action would result in regional emissions of ROG, NO_X, and PM_{10} associated with long-term operation of the proposed facilities. However, these emissions would not exceed levels that would substantially contribute to a potential violation of the applicable air quality standards or to nonattainment conditions. This direct impact would be* ***less than significant****.*

Project operations would result in negligible long-term regional emissions of ROG, NO_x, and PM_{10} associated with increases in mobile source emissions related to additional employee commute. Operation of the proposed facilities could require the addition of up to two employees, resulting in the generation of negligible amounts of ROG, NO_x, and PM_{10} on a yearly basis from commute trips (0.02 TPY of ROG, 0.03 TPY of NO_x, and 0.001 TPY of PM_{10}). In addition, a new electrical power substation would be constructed on-site and is anticipated to require approximately 26 megawatts per year of additional electricity consumption, resulting in the generation of 2.80 TPY of ROG, 38.10 TPY of NO_x, and 0.07 TPY of PM_{10} (South Coast Air Quality Management District 1993). However, because emissions from electrical generating facilities would be either located outside the region, the facilities would be equipped with Best Available Control Technology (BACT) and would be permitted as stationary sources, or the emissions would be offset by the use of pollution credits, pollution from off-site generation of

electricity is generally excluded from the evaluation of project significance (Cadrett, pers. comm., 2005).

The Proposed Action would not result in long-term operational emissions of ROG, NO_x, or PM_{10} that exceed SJVAPCD's or BAAQMD's thresholds of significance and would not be anticipated to substantially contribute to current ozone nonattainment conditions. Consequently, the project-generated emissions would not be anticipated to result in a substantial contribution to a potential violation of NAAQS, CAAQS, or the nonattainment conditions. As a result, this impact would be less than significant.

IMPACT 4.10-c (Alternative 1)

Generation of Long-Term Operational (Local) Mobile-Source Carbon Monoxide Emissions. *Due to the negligible amount of project-generated traffic associated with the Proposed Action, mobile-source CO emissions would not result in or substantially contribute to concentrations that exceed the applicable air quality standards. This direct impact would be* ***less than significant****.*

Project operations would not be anticipated to result in or contribute to CO concentrations that exceed the California 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm because of the negligible amount of project-generated trips as discussed above in Impact 4.10-b (Alternative 1). Thus, mobile-source emissions of CO would not be anticipated to result in or contribute substantially to an air quality violation. The Proposed Action's long-term operational mobile-source impact on air quality would be less than significant.

IMPACT 4.10-d (Alternative 1)

Exposure of Sensitive Receptors to Toxic Air Contaminants. *Construction and long-term operation of the proposed facilities on Victoria Island and Byron Tract would generate diesel particulate matter. However, these emissions would be insubstantial, and sensitive receptors would not be exposed to concentrations that exceed the applicable thresholds. Therefore, this direct impact would be* ***less than significant****.*

Construction of the Proposed Action would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a toxic air contaminant by the ARB in 1998. Project construction would generate diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities. The dose to which sensitive receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project. Thus, the duration of the proposed construction activities would only constitute approximately 4% of the total exposure period. Because the use of mobilized equipment would be temporary

and there are no sensitive receptors located immediately adjacent to proposed areas of construction, diesel PM from construction activities would not be anticipated to result in the exposure of sensitive receptors to levels that exceed applicable standards.

In addition, the long-term operation of the project would not result in any non-permitted sources of toxic air emissions. However, it is likely that a diesel-fueled emergency backup generator would be installed as part of the Proposed Action. Diesel-fueled generators are considered to be stationary sources of TACs and are subject to the Air District's permitting process. Stationary sources are required to be fitted with applicable Toxic Best Available Control Technology (TBACT), and emissions in excess of TBACT are required to be offset elsewhere.

Any generators associated with the project would be consistent with the Air District's permitting guidelines. Therefore, there would be no significant effects associated with this portion of the project. As a result, exposure of sensitive receptors to substantial toxic air emissions from the Proposed Action would be less than significant.

IMPACT 4.10-e (Alternative 1)

Exposure of Sensitive Receptors to Odorous Emissions. *Neither construction nor the operation of the Proposed Action would result in the creation of, or frequent exposure of sensitive receptors to, an objectionable odor. This direct impact would be* ***less than significant****.*

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they can still be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

The Proposed Action would not include the long-term operation of an odorous emission source, and no major stationary odorous emission sources have been identified in the project area. Thus, neither construction nor the operation of the Proposed Action would result in the creation of, or frequent exposure to, an objectionable odor. Occasionally, diesel equipment exhaust can generate objectionable odors, but these dissipate very quickly, and because there are no sensitive receptors located immediately outside the project boundary, this impact would be less than significant.

Cumulative Impacts

IMPACT 4.10-f (Alternative 1 - Cumulative)

Cumulative Generation of Short-Term Construction Criteria Air Pollutant Emissions. *Construction of the intake, pump station, conveyance pipeline, and associated infrastructure would temporarily generate ROG, NO_x, and PM_{10} emissions that would contribute to existing nonattainment conditions with respect to ozone and PM_{10} and further degrade air quality. The Proposed Action's incremental contribution to pollutant emissions would be cumulatively considerable when added to an existing significant cumulative impact. This cumulative impact would be* ***significant****.*

A large number of future projects may contribute to air pollutant emissions in San Joaquin and Contra Costa Counties and contribute to the non-attainment status of the

BAAQMD and the SJVAB for ozone and PM_{10} (see, e.g., Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis," for a list of reasonably foreseeable projects that are planned for construction and that may contribute to emissions). As described under Impact 4.10-a (Alternative 1), project-related construction emissions are considered to be a significant air quality impact. The project's construction-related emissions would also be considered cumulatively considerable when compounded with impacts from other past, present, and reasonably foreseeable future projects. Long-term operational emissions associated with the Proposed Action would be negligible, however, and would not make a cumulatively considerable contribution to air quality effects. The Proposed Action's incremental effect with respect to short-term construction emissions is cumulatively considerable when added to an existing and future significant cumulative air quality impact. This cumulative impact would be significant.

No other significant cumulative impacts would occur.

Mitigation Measures

Mitigation Measure 4.10-a (Alternative 1): Implement SJVAPCD and BAAQMD Measures to Control Construction-Generated Air Pollution Emissions.
Alternative 1 involves construction activities in both San Joaquin and Contra Costa Counties, and air pollution in both counties would be affected by project construction activities in the other county. Therefore, the following measures apply to all of the Proposed Action's construction activities irrespective of the specific location of each construction activity.

Criteria Air Pollutant Emissions. To the extent feasible, CCWD shall implement the following measures to reduce construction-related air quality impacts from heavy duty equipment for NO_x emissions in San Joaquin County (SJVAPCD 2002):

- Use alternative fueled or catalyst-equipped diesel construction equipment.
- Minimize idling time.
- Limit the hours of operation of heavy duty equipment and/or the amount of equipment in use.
- Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run by portable generator).
- Implement activity management (e.g., rescheduling activities to reduce short-term impacts).

SJVAPCD Basic Mitigation Measures. CCWD shall implement the following applicable measures to reduce construction-related air quality impacts of the project to a less-than-significant level for PM_{10} emissions in San Joaquin County (SJVAPCD 2002):

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water,

chemical stabilizer/suppressant, and covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizers/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained.
- The construction contractor shall be responsible for limiting the accumulation of project-generated mud or dirt on SR 4. Actions may include using wheel-washers or installing gravel beds at exit points from unpaved roads onto SR 4 to remove soil buildup on tires and reduce track-out. This measure has been discussed with SJVAPCD and it has been determined that implementation of this measure would reduce track-out on paved access roads and would provide a sufficient substitute for the standard required measure of washing of the roadway to remove accumulation of mud and dirt from the pavement (Kolozsvari, pers. comm., 2005).
- Following the addition of material to, or the removal of material from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Any site with 150 or more vehicle trips per day shall prevent carryout and trackout.

SJVAPCD Enhanced Mitigation Measures. To further reduce PM_{10} emissions, CCWD shall implement the following measures to the extent feasible:

- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1%.

SJVAPCD Additional Mitigation Measures. The SVAPCD strongly recommends that the following additional emissions control measures be implemented at large construction sites. CCWD shall implement these measures to the extent feasible:

- Wash off all trucks and equipment leaving the site.
- To control wind-generated fugitive dust, suspend outdoor construction, excavation, and other earth-moving activities that disturb the soil whenever the visible dust emissions exceed 20% opacity.

- Limit area subject to excavation, grading, and other construction activity at any one time.

BAAQMD Basic Mitigation Measures. CCWD shall implement the following measures to reduce construction-related air quality impacts of the project to a less-than-significant level for PM_{10} emissions in Contra Costa County (BAAQMD 1999):

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites. [Not applicable to the Proposed Action or Alternatives 2 and 3, given the location of the project site and lack of paved access roads, parking, and staging areas.]
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. [Not feasible for the Proposed Action or Alternatives 2 and 3, given the public safety implications associated with sweeping SR 4, the only adjacent public roadway.]

BAAQMD Enhanced Mitigation Measures. The BAAQMD directs that the following additional measures should be implemented for project sites greater than 4 acres. CCWD shall implement these additional measures to reduce PM_{10} emissions to a less-than-significant level:

- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Replant vegetation in disturbed areas as quickly as possible.

BAAQMD Optional Mitigation Measures. CCWD shall implement the following optional mitigation measures to the extent feasible:

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- Limit the area subject to excavation, grading, and other construction activity at any one time.

Implementation of Mitigation Measure 4.10-a (Alternative 1) would reduce project-generated construction-related air quality impacts from emissions of PM_{10} to a less-than-significant level. However, construction-generated NO_x emissions could still exceed the SJVAPCD's significance threshold. Consequently, short-term construction-generated emissions impacts, even after mitigation is implemented, would be significant and unavoidable.

Mitigation Measure 4.10-f (Alternative 1 - Cumulative): Implement SJVAPCD and BAAQMD Measures to Control Construction-Generated Air Pollution Emissions.
This mitigation measure is described above under Mitigation Measure 4.10-a (Alternative 1). The Proposed Action would result in a significant and unavoidable cumulative impact with respect to short-term construction emissions even with implementation of this mitigation measure. For future development projects that would be implemented in the BAAQMD and the SJVAB, the measures described in Mitigation Measure 4.10-a (Alternative 1) would be required in adherence to the requirements set forth by the BAAQMD and the SJVAPCD. Future projects may also contribute to increased pollutant levels during their operational phases. Because of the large scale and number of future projects, and given the non-attainment status of the project area for ozone and PM_{10}, it is anticipated that there will be a significant cumulative impact on air quality. The incremental contribution of the construction emissions associated with the Proposed Action would be a cumulatively considerable contribution to an existing significant cumulative impact. This impact would therefore be significant and unavoidable.

4.10.2.5 Alternative 2, Indirect Pipeline Alternative

The direct, indirect, and cumulative impacts of Alternative 2 would be essentially the same as described for the Proposed Action because the construction processes would be very similar, with the same type and quantity of equipment required, and construction processes would take place at approximately the same distance from sensitive receptors. Construction of all facilities would be exactly the same between Alternative 2 and the Proposed Action except that the Alternative 2 pipeline would be somewhat longer, thereby generating additional emissions. The same mitigation measure would apply to reduce the effects of the generation of short-term air quality impacts from construction activities, and the conclusions would be the same. Direct and cumulative impacts resulting from short-term construction-generated NO_x emissions, even after mitigation is implemented, would be significant and unavoidable.

4.10.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 would be exactly the same as described for Alternative 1. The same mitigation measure would apply to reduce the effects of the generation of short-term air quality impacts from construction activities, and the conclusions would be the same. Direct and cumulative impacts resulting from short-term construction-generated NO_x emissions, even after mitigation is implemented, would be significant and unavoidable.

4.10.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.10-a (Alternative 4)

Generation of Short-Term Construction Criteria Air Pollutant Emissions. *Construction of the Desalination Alternative project facilities would temporarily generate ROG, NO_x, and PM_{10} emissions, which would potentially contribute to existing nonattainment conditions with respect to ozone and further degrade air quality. This direct impact would be* ***significant****.*

This impact is similar to Impact 4.10-a (Alternative 1). Project construction would temporarily generate ROG, NO_x, and PM_{10} emissions from excavation for pipeline trenching, concrete foundations, paving, motor vehicle exhaust associated with construction equipment, construction employee commute trips, material transport (especially on unpaved surfaces), and other construction activities. Construction equipment emissions of ozone precursors and CO are included in the emission inventory that is the basis for regional air quality plans and are not expected by the BAAQMD to impeded attainment or maintenance of ozone and CO standards in the air basin. Under BAAQMD guidelines, construction emissions would be considered less than significant if specified BAAQMD construction control mitigation measures for PM_{10} are included as part of the project. Because these control mitigation measures have not been incorporated into the Desalination Alternative, project-related construction emissions would be significant.

IMPACT 4.10-b (Alternative 4)

Generation of Long-Term Operational (Regional) Criteria Air Pollutant Emissions. *The Desalination Alternative would result in regional emissions of ROG, NO_X, and PM_{10} associated with long-term operation of the project facilities. However, these emissions would not exceed levels which would substantially contribute to a violation of the applicable air quality standards or to nonattainment conditions. This direct impact would be* ***less than significant****.*

Project operations would result in negligible long-term regional emissions of ROG, NO_x, and PM_{10} associated with increases in mobile source emissions related to additional employee commute. Operation of the Desalination Alternative project facilities would require the addition of an estimated six employees per 8-hour shift, 7 days per week, 24 hours a day, resulting in the generation of negligible amounts of ROG, NO_x, and PM_{10} on a yearly basis from employee commute trips (0.06 TPY of ROG, 0.08 TPY of NO_x, and 0.004 TPY of PM_{10}). In addition, the new desalination treatment facility would be anticipated to require approximately 1,600 to 2,100 megawatt-hours per day of additional electricity consumption, resulting in the generation of up to 1.89 TPY of ROG, 217.35 TPY of NO_x, and 7.56 TPY of PM_{10} (South Coast Air Quality Management District 1993). However, because emissions from electrical generating facilities would be either located outside the region or offset by the use of pollution credits, pollution from off-site generation of electricity is generally excluded from the evaluation of project significance (Cadrett, pers. comm., 2005).

The Desalination Alternative would not result in long-term operational emissions that exceed BAAQMD's thresholds of significance and would not substantially contribute to

current ozone nonattainment conditions or to a violation of the Ambient Air Quality Standards. Therefore, this impact would be less than significant.

IMPACT 4.10-c (Alternative 4)

Generation of Long-Term Operational (Local) Mobile-Source Carbon Monoxide Emissions. *Due to the negligible amount of project-generated traffic associated with the Desalination Alternative, mobile-source CO emissions would not result in or substantially contribute to concentrations that exceed the applicable air quality standards. This direct impact would be* ***less than significant****.*

Operations would not be anticipated to result in or contribute to CO concentrations that exceed the California 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm because of the negligible amount of project-generated trips as discussed above in Impact 4.10-b (Alternative 4). Thus, mobile-source CO emissions would not be anticipated to result in or contribute substantially to an air quality violation. This alternative's long-term operational impact on air quality would be less than significant.

IMPACT 4.10-d (Alternative 4)

Exposure of Sensitive Receptors to Toxic Air Contaminants. *Construction and long-term operation of the Desalination Alternative project facilities would generate toxic air contaminant diesel particulate matter. However, these emissions would not be substantial, and sensitive receptors would not be exposed to concentrations that exceed the applicable standards. Therefore, this direct impact would be* ***less than significant****.*

This impact is essentially the same as Impact 4.10-d (Alternative 1). Exposure of sensitive receptors to substantial toxic air emissions from construction and operation of the Desalination Alternative project facilities would be less than significant.

IMPACT 4.10-e (Alternative 4)

Exposure of Sensitive Receptors to Odorous Emissions. *Neither construction nor the operation of the Desalination Alternative project facilities would result in the creation of or frequent exposure of sensitive receptors to an objectionable odor. This direct impact would be* ***less than significant****.*

This impact is essentially the same as Impact 4.10-e (Alternative 1) and would be less than significant.

Cumulative Impacts

IMPACT 4.10-f (Alternative 4 - Cumulative)

Cumulative Generation of Short-Term Construction Criteria Air Pollutant Emissions. *Construction of the Desalination Alternative project facilities would temporarily generate ROG, NO_x, and PM_{10} emissions, which could degrade air quality. This cumulative impact would be* ***significant.***

A large number of future projects may contribute to air pollutant emissions in Contra Costa County (see, e.g., Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis," for a list of reasonably foreseeable projects that are planned for construction and that may contribute to emissions in Contra Costa County).

As described under Impact 4.10-a (Alternative 4), project-related construction emissions are considered to be a significant air quality impact. They would also be considered cumulatively considerable when compounded with impacts from other past, present, and reasonably foreseeable future projects. Long-term operational emissions associated with the Desalination Alternative would be negligible, however, and would not make a cumulatively considerable contribution to air quality effects. Because of the potential for construction emissions to be individually significant and cumulatively considerable, the cumulative impact would be significant.

No other cumulative impacts would occur.

Mitigation Measures

Mitigation Measure 4.10-a (Alternative 4): Implement BAAQMD Measures to Control Construction-Generated Air Pollutants.
CCWD shall implement the BAAQMD Basic and Enhanced Mitigation Measures and, to the extent feasible, the BAAQMD Optional Measures described under Mitigation Measure 4.10-a (Alternative 1) to reduce construction-related air quality impacts from PM_{10} emissions.

With implementation of these mitigation measures, construction-generated emissions would be considered not to result in a substantial contribution to a violation of the Ambient Air Quality Standards or current ozone nonattainment conditions. Short-term construction-generated emissions impacts would be reduced to less-than-significant levels according to the standards of the BAAQMD (the standards of the SJVAPCD would not apply to this alternative).

Mitigation Measure 4.10-f (Alternative 4): Implement BAAQMD Measures to Control Construction-Generated Air Pollutants.
CCWD shall implement the BAAQMD Basic and Enhanced Mitigation Measures and, to the extent feasible, the BAAQMD Optional Measures described under Mitigation Measure 4.10-a (Alternative 1) to reduce construction-related air quality impacts from PM_{10} emissions.

The Desalination Alternative would result in a significant and unavoidable cumulative impact with respect to short-term construction emissions even with implementation of this mitigation measure. For future development projects as for the Desalination Alternative, implementation of the BAAQMD Basic, Enhanced, and Additional Control Measures would be required in adherence to the requirements set forth by the BAAQMD Guidelines (BAAQMD 1999). Future projects may also contribute to increased pollutant levels during their operational phases. Because of the large scale and number of future projects, and given the non-attainment status of the SFBAB for ozone and PM_{10}, it is anticipated that there will be a significant cumulative impact on air quality. The incremental contribution of the construction emissions associated with the Desalination Alternative, despite the reductions resulting from implementation of this mitigation measure, would be a cumulatively considerable contribution to an existing significant cumulative impact. This impact would therefore be significant and unavoidable.

4.11 Noise

This section describes regulations that apply to noise, noise-sensitive land uses and existing noise sources in the vicinity of the proposed project site and Desalination Alternative project sites, and potential noise impacts on the human environment from project construction and operation. Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of the intended purpose of the land uses. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Noise effects are evaluated according to the standards of the jurisdiction in which they are generated, regardless of where they are perceived.

Sound levels are represented throughout this section in terms of an "A-weighted" decibel (dBA) scale. The dBA scale is an expression of sound pressure levels in logarithmic units called decibels (dB) that discriminates among (i.e., "weights") sound frequencies in a manner approximating the sensitivity of the human ear. Appendix F-3, "Acoustic Fundamentals," provides an overview of acoustic fundamentals, including definitions of noise terminology used in this section and an explanation of the dBA scale, as background information for this section.

4.11.1 Affected Environment

This section briefly summarizes applicable regulations concerning noise, and describes ambient noise conditions in the vicinities of the proposed project site and Desalination Alternative project sites.

4.11.1.1 Regulatory Setting

Federal

The Federal Highway Administration, the Federal Aviation Administration, and the Department of Housing and Urban Development provide standards for noise levels in relation to highway projects, aircraft standards, and Federally funded housing, respectively. None of these standards are relevant to this study.

State

The State of California has adopted noise standards in areas of regulation not preempted by the Federal government. These regulate noise levels of motor vehicles and freeway noise affecting classrooms, set standards for sound transmission control and occupational noise control, and identify noise insulation standards. In addition, the Governor's Office of Planning and Research has developed the *State of California General Plan Guidelines*, which includes land use compatibility guidelines for community noise environments to

assist local agencies in their preparation of general plan noise elements (State of California 2003). None of these standards are directly relevant to this study.

Local

Contra Costa County
The *Contra Costa County General Plan* Noise Element establishes specific policies to ensure acceptable noise environments for each land use (Contra Costa County 1996). Most of these policies address land use compatibility guidelines for evaluating the acceptability of existing and future exterior noise levels (i.e., transportation) at new projects proposing noise-sensitive receptors (e.g., residential development) and are not directly applicable to the proposed project and alternatives. However, the following policies addressing noise levels at existing sensitive receptors and construction noise are applicable.

- Policy 11-7. Public projects shall be designed and constructed to minimize long-term noise impacts on existing residents.

- Policy 11-8. Construction activities shall be concentrated during the hours of the day that are not noise-sensitive for adjacent land uses and should be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.

Contra Costa County has not adopted a noise ordinance, or performance standards for stationary noise sources, under which construction noise is categorized. However, noise from construction activities in Contra Costa County is considered exempt from applicable standards during daytime hours (Seat, pers. comm., 2005).

San Joaquin County
The *San Joaquin County General Plan* Noise Element includes a policy that sets acceptable exterior noise levels (i.e., transportation) at new projects proposing noise-sensitive receptors (e.g., residential development and schools), which are not directly applicable to the proposed project (San Joaquin County 1996).

Chapter 9 of the San Joaquin County Development Title includes the following pertinent guidance concerning noise levels from stationary noise sources:

- Standards for Stationary Sources. For proposed projects that will create stationary noise sources or expand existing stationary noise sources, the exterior, non-transportation noise level performance standards set forth in Table 4.11-1 shall be applicable.

- Exemptions. The following shall be exempt from the provisions of Chapter 9:

    - Noise sources associated with construction, provided such activities do not take place before 6:00 a.m. or after 9:00 p.m. on any day.

- Noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities.

Table 4.11-1
Exterior Non-Transportation Noise Level Standards

Noise Level Descriptor	Daytime [a] (7 a.m. to 10 p.m.)	Nighttime [b] (10 p.m. to 7 a.m.)
Hourly L_{eq}	50 dBA	45 dBA
Maximum Sound Level (L_{max})	70 dBA	65 dBA

[a] Where the location of outdoor activity areas is unknown or not applicable, the noise standard shall be applied at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards shall be applied on the receiving side of noise barriers or to the property-line noise mitigation measures.

[b] Each of the above noise levels may be lowered by 5 dBA for simple tone noises or for noises consisting primarily of speech or music.

Source: San Joaquin County Development Title 1999

Community Ambient Noise Degradation

In addition to the guidelines and standards presented above, another consideration is the degradation of the existing ambient noise environment due to an increase in the ambient noise levels. Generally, a 1-dBA increase is imperceptible except under special conditions; outside of the laboratory, a 3-dBA increase is just noticeable; a change of at least 5 dBA is required before any noticeable change in community response would be expected; and a 10-dBA increase is subjectively perceived as an approximate doubling in loudness and almost always causes an adverse community response (Contra Costa County 1996).

4.11.1.2 Environmental Setting

Victoria Island/Byron Tract

The vicinity of the proposed project site consists primarily of rural/agricultural land uses. Noise-sensitive land uses in the area include temporary agricultural worker housing on Victoria Island near State Route (SR) 4, over 1 mile from the proposed intake site on Victoria Canal and on the west side of Victoria Island about 1 mile northwest of the intake site; a farm residence on Victoria Island north of SR 4, which is 2 miles or more from the proposed project site; residential, recreational, and commercial land uses in Discovery Bay, which are approximately 3 miles or more from the proposed intake site and the nearest of which is about 3,000 feet from the Byron Tract portion of the project site; and the Golden Gate Water-Ski Club, which is zoned for 16 residences and is located about one-half mile southwest of the nearest potential intake site location. Exhibit 4.11-1 shows the nearest noise-sensitive land uses.

Noise in the vicinity of the proposed project site is principally generated by vehicular traffic, agricultural activity, trains, and occasional aircraft flyovers. Vehicular traffic on the roadways, primarily SR 4, is by far the dominant source of noise.

4.11 Noise

An ambient noise survey was conducted by EDAW on May 20, 2005, to document the existing noise environment at locations surrounding the proposed project site. The dominant noise sources noted during the survey were vehicular traffic on SR 4 to the north of the site and agricultural equipment (tractors) in the vicinity of the proposed intake facility location. Short-term noise-level measurements were taken in accordance with the American National Standards Institute acoustic standards at two locations bordering the proposed project site during the non-peak traffic hours using a Larson Davis model 820 sound-level meter at approximately 4.5 feet above ground level. The short-term L_{eq} value for each ambient noise measurement location is presented in Table 4.11-2 along with the L_{max} and L_{min}.[1]

Table 4.11-2
Ambient Noise Levels Near the Proposed Project Site

Noise Measurement Location	Date and Time	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
Southeast corner of Discovery Bay ▪ Approximately 2,700 feet from the Byron Tract portion of the proposed project site ▪ Approximately 50 feet from center line of SR 4 ▪ Approximately 300 feet from permanent sensitive receptors in Discovery Bay nearest to the proposed project site	May 20, 2005 10:30 am – 10:45 am	75.1	91.4	42.0
On Union Island, directly south of and adjacent to Victoria Canal ▪ North end of Bonetti Road ▪ Approximately 3,000 feet from the proposed intake site	May 20, 2005 11:48 am – 12:03 pm	65.0	83.9	45.1

Source: Data collected by EDAW on May 20, 2005

Average daytime noise levels in the vicinity of the proposed project site were found to range from 65.0 to 75.1 dBA L_{eq}, depending primarily on the type of activity occurring in the vicinity of the measurement. Traffic along SR 4 was moderate, with some semi-truck traffic. Although there was no vehicle traffic on Bonetti Road (on Union Island, south of Victoria Canal), noise sources encountered at the end of this road, directly adjacent to Victoria Canal, included agricultural equipment, somewhat frequent small airplane flyovers, and an irrigation ditch pump operating steadily. Maximum noise levels near the proposed project site range from 83.9 to 91.4 dBA L_{max}. Nighttime noise levels were not measured as part of the ambient noise survey, but would be expected to be much less than daytime levels because the dominant noise sources in the area consist of roadway traffic and agricultural operations, which primarily occur in the daytime hours.

[1] L_{max} (Maximum Noise Level) is the maximum instantaneous noise level during a specific period of time. L_{min} (Minimum Noise Level) is the minimum instantaneous noise level during a specific period of time. L_{eq} (Equivalent Noise Level) is the energy mean (average) noise level. See Appendix F-3 for additional information regarding these terms.

Source: EDAW 2005

Noise Sensitive Land Uses

EXHIBIT 4.11-1

During the Bonetti Road measurement, small aircraft were observed passing over the site approaching and leaving Byron Airport. Thus, noise levels from aircraft activity were one dominant noise source at the proposed project site during the field survey on May 20, 2005.

Desalination Alternative Project Sites

The Desalination Alternative project sites represent a variety of noise environments. The Mallard Slough site is surrounded by undeveloped marshland and is situated in an industrial area that is distant from sensitive receptors. Primary sources of noise include those associated with the nearby railroad corridor, adjacent industrial land uses (e.g., mechanical equipment, occasional truck deliveries, etc.), and local arterials (e.g., roadway traffic noise). Ambient noise levels experienced within this type of land use would be less than those encountered at the proposed project site (Victoria Island and Byron Tract) because of the absence of agricultural processes and associated equipment and the undeveloped nature of the immediately surrounding land.

The new untreated-water conveyance pipeline would be routed through urban residential areas in unincorporated Pittsburg, adjacent to SR 4, along the Contra Costa Canal corridor, and through urban residential and industrial areas in the vicinity of Clyde and Concord. Primary sources of noise include those associated with the nearby highway and local arterials, and adjacent industrial and residential land uses.

Bollman WTP (site for the new desalination treatment facility) is located in an industrial area, with the primary sources of noise resulting from this land use.

The new concentrate disposal pipeline would pass through generally industrial areas west of the Bollman WTP and through open space to Suisun Bay.

4.11.2 Environmental Consequences

4.11.2.1 Methods and Assumptions

Noise-sensitive land uses and major noise sources in the vicinity of the proposed project site were identified based on existing documentation and site visits. To assess potential temporary short-term construction noise impacts, sensitive receptors and their relative exposure (considering topographic barriers and distance) were identified. Typical noise levels associated with the specific types of construction equipment anticipated to be used for project construction were determined, and resultant potential noise levels at those receptors were calculated. Most of the assessment addresses construction noise levels produced at the proposed intake site because the greatest levels of construction noise generation would be associated with construction of the intake and fish screen, pump station and associated facilities, and setback levee at this location. As described later in this section, the construction activity that would generate the most noise is pile driving, which would be conducted at the proposed intake site and at the tunneling pits at the ends of the Old River pipeline crossing on Victoria Island and Byron Tract. Predicted noise levels were compared with standards adopted by the local agencies where the relevant project components would be located. The evaluation of potential long-term (operational) noise impacts considered the potential levels of operational noise, existing noise-sensitive

land uses, documented noise levels, and attenuation rates. For non-transportation sources (e.g., stationary and construction equipment), a noise attenuation rate of 6 dBA per doubling of distance was assumed in all calculations, for both short- and long-term impacts.

The analysis of noise impacts of the Desalination Alternative was based on a qualitative assessment of the noise-sensitive land uses in the vicinity of the Desalination Alternative project sites and consideration of the likely noise levels associated with construction and operation of the desalination plant and associated facilities. The construction equipment assumptions used in the analysis for the Proposed Action would generally apply to the Desalination Alternative because similar construction equipment would be used to construct facilities for the Desalination Alternative.

4.11.2.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. CEQA thresholds with respect to airports or private airstrips are not relevant to the project and are therefore not included here. An alternative was determined to result in a significant effect on the noise environment as follows:

- **Short-Term Construction Noise Impacts.** Short-term noise impacts from construction on Victoria Island (San Joaquin County) would be considered significant if construction activities would be conducted before 6:00 a.m. or after 9:00 p.m., as specified in the exemptions to Table 4.11-1, and if noise levels would exceed the applicable performance standards identified in Table 4.11-1 or result in a noticeable increase (i.e., 5 dBA or greater) in ambient noise levels at nearby noise-sensitive land uses.

  Short-term noise impacts from construction on Byron Tract and elsewhere in Contra Costa County would be considered significant if construction activities would be conducted outside of normal working hours Monday through Friday and if noise levels would result in a noticeable increase (i.e., 5 dBA or greater) in ambient noise levels at nearby noise-sensitive land uses.

- **Traffic Noise Impacts.** Long-term traffic noise impacts would be significant if project-generated traffic would increase the average daily noise levels at a noise-sensitive land use by more than 5 dBA or cause the overall level to exceed the "normally acceptable" standard for land use compatibility established by the Contra Costa County and San Joaquin County General Plans (60 dBA L_{dn} for the most noise-sensitive land uses considered by each jurisdiction in its general plan). The Proposed Action and alternatives would generate very minor traffic increases (see Section 4.9, "Transportation and Circulation") and would not exceed these standards.

- **Stationary and Area-Source Noise Impacts.** Long-term stationary source noise impacts would be significant if the project would result in substantial permanent increases in ambient noise levels in the project vicinity.

  This threshold would be exceeded in San Joaquin County if project-generated noise levels would result in a substantial permanent increase in ambient noise levels (i.e., 5 dBA), or exceed the Development Title standards for exterior stationary source noise (see Table 4.11-1). The standards generally limit exterior noise levels (measured at the property line of the sensitive land use) to a maximum of 50 dBA hourly L_{eq} during daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA hourly L_{eq} during nighttime hours (10:00 p.m. to 7:00 a.m.).

  The threshold would be exceeded in Contra Costa County if the project results in a substantial permanent increase in ambient noise levels (i.e., 5 dBA) at noise-sensitive receptors (i.e., residences).

- **Exposure of Sensitive Receptors to or Generation of Excessive Ground-Borne Vibration or Noise Impacts.** For most structures, a peak particle velocity (ppv) threshold of 0.5 inch per second is sufficient to avoid structural damage; however, the California Department of Transportation recommends a more conservative threshold of 0.2 inch per second ppv for residential buildings (California Department of Transportation 2002). Impacts would be considered significant if 0.2 inch per second ppv were reached at nearby vibration-sensitive receptors.

Potential underwater sound-pressure effects on fish are addressed in Section 4.3, "Delta Fisheries and Aquatic Resources."

4.11.2.3 No-Action Alternative

Under the No-Action Alternative, no construction work would take place and no construction-generated noise would result. No new stationary sources of noise would be created, and there would be no new source of ground-borne vibration or noise. The No-Action Alternative also would make no contribution to any cumulative noise impacts.

4.11.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.11-a (Alternative 1)

Generation of Short-Term Construction Noise. *Construction of facilities under the Proposed Action could generate noise levels that exceed Contra Costa County or San Joaquin County significance threshold standards at nearby sensitive receptors if construction activities are carried out during noise-sensitive hours, causing sleep disturbance and/or annoyance. This direct impact would be* ***potentially significant****.*

Construction of facilities under the Proposed Action would include site grading, clearing, and excavation; levee and building construction; and the installation of a pipeline between Victoria Island and Byron Tract, in addition to other construction operations.

4.11 Noise

On-site equipment required for construction is anticipated to include excavators, backhoes, bulldozers, scrapers, rollers, graders, loaders, haul trucks, water trucks, pile drivers, and cranes. According to the U.S. Environmental Protection Agency (EPA), the noise levels of primary concern are typically associated with the site preparation phase because of the on-site equipment associated with clearing, grading, and excavation. In addition, among the different types of construction equipment that would be used to construct the project facilities, the pile driver, which would be used at the intake location and at the tunneling pits on Byron Tract and Victoria Island, would generate the highest noise levels. Depending on the operations conducted, individual equipment noise levels can range from 79 to 101 dBA at 50 feet, as indicated below in Table 4.11-3.

Table 4.11-3
Typical Construction Equipment Noise Levels

Type of Equipment	Noise Level in dBA at 50 feet[b]	
	Without Feasible Noise Control	With Feasible Noise Control[a]
Pile Driver	101	95
Dozer or Tractor	80	75
Excavator	88	80
Scraper	88	80
Front-end Loader	79	75
Backhoe	85	75
Grader	85	75
Crane	83	75
Truck	91	75

[a] Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturer's specifications.
[b] Estimates correspond to a distance of 50 feet from the noisiest piece of equipment and 200 feet from the other equipment.
Sources: EPA 1971

The decibel scale is logarithmic, and noise levels measured in decibels therefore are not directly additive. For example, a 65-dBA source of sound, such as a truck, when joined by another 65-dBA source results in a sound amplitude of 68 dBA, not 130 dBA (i.e., doubling the source strength increases the sound pressure by 3 dBA). Laboratory measurements correlate a 10-dBA increase in amplitude with a perceived doubling of loudness. (See Appendix F-3, "Acoustic Fundamentals," for additional information.) Consequently, the perceived noise level shown in Table 4.11-3 for a pile driver is about two to four times the noise level of the other pieces of equipment listed in the table.

Because the pile driver is substantially louder than the other pieces of on-site heavy-duty equipment that would be used for project construction activities, it is likely that the perceived noise level would be the same when several pieces of equipment, including a pile driver, are being operated simultaneously and when a pile driver is operated alone. Therefore, it is anticipated that the highest potential noise levels during construction would be intermittent noise levels of approximately 101 dBA at 50 feet from one of the

sites where pile driving is taking place (i.e., the noise produced by the pile driver), regardless of whether other equipment is being used. Noise levels would be lower without operation of a pile driver. For example, without mitigation, the combined noise level at 50 feet produced by a truck, excavator, backhoe, and scraper being used simultaneously in the same vicinity would be 95 dBA.

Based on these equipment noise levels and assuming a noise attenuation rate of 6 dBA per doubling of distance from the source, no noise-control devices, and no intervening barriers, worst-case exterior noise levels at the sensitive receptors nearest to the intake site (Golden Gate Water-Ski Club), located approximately 2,500 feet away, could be 67 dBA. San Joaquin County exempts construction operations that occur during the hours of 6:00 a.m. and 9:00 p.m. on any day from the applicable noise standards (San Joaquin County 1999). However, if construction activities in San Joaquin County were carried out during noise-sensitive hours (9:00 p.m. to 6:00 a.m.), the nighttime exterior standard of 45 dBA hourly L_{eq} would apply. Union Island levees between the intake location and receptors would help to attenuate the noise level; however, worst-case levels may still exceed 45 dBA. The next nearest permanent sensitive receptors are the residences in Discovery Bay to the northwest and a farm residence to the northeast, which are approximately 15,000 feet and across SR 4 from the intake site. These residences could experience worst-case sound levels from intake construction of approximately 52 dBA, which would also exceed the 45 dBA hourly L_{eq} noise standard for noise sources in San Joaquin County in effect if construction is conducted outside of exempt hours. However, it is possible that the sound wall on the north side of SR 4 would further reduce perceived construction noise levels at the Discovery Bay residences to below the threshold.

Because Byron Tract is in Contra Costa County, construction activity there would be subject to the thresholds for short-term construction noise in Contra Costa County. The receptors in Discovery Bay are the closest sensitive receptors. The nearest of them would be located approximately 3,000 feet from construction taking place on Byron Tract. These receptors could experience combined worst-case noise levels of approximately 65 dBA associated with construction equipment at this site (specifically, pile driving equipment used to install sheet piles at the Byron Tract tunneling pit). This level of construction noise would likely result in a 5-dBA or greater increase in ambient noise levels at Discovery Bay residences. It is possible that construction operations on Byron Tract may be conducted outside of daytime hours, when such activity is typically considered to be exempt from the applicable noise standards (Seat, pers. comm., 2005) and, particularly during periods when traffic noise levels are low, may produce a 5-dBA increase in the ambient noise level.

In addition, the applicable noise standards could potentially be exceeded at the Discovery Bay receptors if pile driving were conducted during non-exempt hours (9:00 p.m. to 6:00 a.m.) at the Victoria Island tunneling pit.

Because these circumstances could result in noise levels that exceed the applicable standards, resulting in increased annoyance and/or sleep disruption to occupants of residential dwellings, this impact would be potentially significant.

IMPACT 4.11-b (Alternative 1)

Long-Term Increases in Noise. *Implementation of the Proposed Action would contribute negligibly to an increase in traffic-related noise levels. The project would establish new stationary noise sources (intake and pump station); however, these sources would not create off-site noise levels that would exceed applicable standards at sensitive receptor locations. This impact would be* ***less than significant****.*

The new intake and pump station would be operated remotely. CCWD personnel would conduct periodic maintenance on-site, with possibly a few trips per week. During times when the pump station is in operation, the frequency of maintenance trips would likely increase and may occur as often as daily. The level of traffic associated with maintenance trips would be negligible in comparison with the existing roadway traffic on SR 4, and any increase in noise levels associated with the traffic increase would be unquantifiable.

The Proposed Action would involve the long-term operation of noise-generating stationary equipment, including a pump station at the proposed intake. Without proper noise control or enclosure, such equipment could result in noise levels in the range of 78–88 dBA at 3–5 feet from the source depending on the exact type and size (EPA 1971). However, the pump station would be enclosed in a concrete structure resulting in exterior noise levels below 50 dBA at 50 feet. The only other increase in stationary and area-source noise associated with the Proposed Action would be associated with mechanical equipment, such as an emergency standby generator installed at the proposed electrical substation. The generator would only be used infrequently in emergency situations, and would be sufficiently far from sensitive receptors that they would be unaffected by its use. Also, the new fish screen would contain mechanical cleaning mechanisms that would operate continuously and produce limited amounts of noise. Because new stationary sources would be enclosed in permanent structures or equipped with appropriate noise attenuation measures, coupled with the fact that the nearest sensitive receptor is approximately one-half mile away from any proposed stationary source location, off-site noise levels would not be anticipated to differ from existing noise levels at these receptors. Thus, operational noise levels associated with project implementation would be in compliance with applicable performance standards at nearby receptors. The direct impact of the Proposed Action on long-term noise levels would be less than significant.

IMPACT 4.11-c (Alternative 1)

Exposure of Sensitive Receptors to or Generation of Excessive Ground-Borne Vibration or Noise. *The construction of the Proposed Action could have the potential to result in generation of excessive ground-borne vibration or ground-borne noise levels at 25 feet from the source equipment. However, because no structures are located immediately outside the project boundary, no structural or architectural damage would occur as a result of the associated ground-borne vibration levels. This direct impact would be* ***less than significant****.*

Construction activities have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. Ground-vibration levels associated with various types of construction equipment are summarized in Table 4.11-4. Vibration generated by construction equipment typically spreads through the ground and diminishes in magnitude with increases in distance. While effects of ground vibration may be imperceptible at low

levels, they may result in detectable vibrations and slight damage to nearby structures at moderate and high levels, respectively. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage.

Table 4.11-4
Representative Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity at 25 feet (in/sec)
Pile Driver (impact)	upper range	1.518
	Typical	0.644
Pile Driver (sonic)	upper range	0.734
	Typical	0.170
Large Bulldozer		0.089
Caisson or Well Drilling		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003
Source: Federal Transit Administration 1995		

Construction operations associated with the Proposed Action would be anticipated to include pile drivers, bulldozers, backhoes, loaders, and trucks. Ground-borne noise and vibration resulting from construction of the Proposed Action would primarily be associated with the use of pile drivers, which typically result in relatively high levels of ground-borne vibration at 25 feet from the process, as shown in Table 4.11-4. However, because the nearest residential structures would be located approximately 0.5 mile from the construction site at the nearest point, vibration levels would not surpass the most conservative threshold of 0.2 inch per second ppv at these nearby structures. In addition, no other structures would be located within 25 feet of construction activities. Therefore, it would not be expected that the 0.5 ppv threshold for structural damage to most structures would be exceeded at any nearby structure. Thus, the temporary construction vibration associated with on-site equipment would not be anticipated to expose sensitive receptors to or generate excessive ground-borne vibration or ground-borne noise levels. Therefore, this direct impact would be less than significant.

Cumulative Impacts

The Proposed Action would result in a potentially significant noise impact associated with short-term construction activities. Impacts associated with long-term operational traffic and stationary noise sources would be minor, as would excessive ground-borne vibration or noise impacts.

Noise is a localized occurrence and attenuates with distance. Therefore, only future cumulative development projects in the direct vicinity of the project site would have the potential to add to anticipated stationary project-generated noise, thus resulting in cumulative noise impacts. No related projects are known to be planned in the direct vicinity of the Proposed Action (see Section 4.1.3, “Cumulative Impact Analysis,” and Appendix F-1, “Local Development Projects Considered in Cumulative Impact Analysis”).

Although the construction of the proposed facilities could result in significant noise impacts without mitigation, because no related projects would be under construction in the direct vicinity of the proposed project site concurrent with construction of the Proposed Action, no cumulative noise impact would occur.

Mitigation Measures

Mitigation Measure 4.11-a (Alternative 1): Implement Measures to Control Generation of Short-Term Construction Noise.
CCWD shall ensure that the following measures are implemented during construction:

- Construction equipment shall be fitted with feasible noise-control devices as presented in Table 4.11-3.

- Where practical and feasible given other construction sequencing constraints, all construction operations on Victoria Island (San Joaquin County) shall be limited to the hours between 6:00 a.m. and 9:00 p.m. any day, and on Byron Tract (Contra Costa County) shall be limited to daytime hours.

  For situations in which it is deemed necessary to construct outside of exempt hours, all of the following limitations shall apply to prevent construction-generated noise from exceeding the applicable standards:

  (1) Pile driving shall not be conducted before 6:00 a.m. or after 9:00 p.m. on Victoria Island or outside daytime hours on Byron Tract.

  (2) No more than two pieces of equipment that generate noise levels of 75 dBA each with the use of feasible noise control devices shall operate simultaneously at the intake site.

  (3) No more than one piece of equipment that generates a noise level of 80 dBA with the use of feasible noise control devices shall operate at one time within 2,900 feet of a sensitive receptor.

Fitting construction equipment with feasible noise-control devices would reduce worst-case construction noise generated at the intake location to approximately 52 dBA at Discovery Bay and the farm residence approximately 15,000 feet from the intake location. At the nearest sensitive receptors to the intake site (Golden Gate Water-Ski Club), the worst-case noise level would be reduced to approximately 57 dBA. These levels would still be well above the applicable standard (i.e., 45 dBA) for construction activities occurring outside of exempt hours and would likely increase ambient noise levels by at least 5 dBA. With the use of feasible noise-control devices and without operation of a pile driver, a likely worst-case noise level—for example, the combined noise level produced by a truck, excavator, backhoe, and scraper being used simultaneously in the same vicinity—would be approximately 84 dBA at 50 feet, 50 dBA at the nearest sensitive receptor, and 35 dBA at Discovery Bay and the farm residence 15,000 feet away.

Limiting construction activity at the intake site that occurs outside of the San Joaquin County hours of exemption such that it entails the use of no more than two pieces of equipment that generate noise levels of 75 dBA each and no single piece of equipment that generates a noise level of 80 dBA with the use of feasible noise control devices would reduce noise levels at the nearest sensitive receptors to 45 dBA.

Implementation of the all of the above measures would reduce construction noise levels generated on Victoria Island to a less-than-significant level.

For construction activity on Byron Tract, the worst-case combined noise level from construction equipment experienced at Discovery Bay, in the absence of pile driving, would be approximately 55 dBA. This noise level could be produced by simultaneous operation of machinery that includes two pieces of heavy equipment, such as an excavator and a scraper, both of which produce noise levels of about 88 dBA at 50 feet. This level of construction noise likely would not result in a 5-dBA increase in ambient noise levels at Discovery Bay residences, as roadway traffic along SR 4 would be the dominant noise source at this location and is likely to be louder than the perceived construction-generated noise, even during nighttime hours. Therefore, implementing feasible noise control and restricting the operation of a pile driver in Contra Costa County to daytime hours would be sufficient to reduce construction noise generated on Byron Tract to a less-than-significant level.

4.11.2.5 Alternative 2, Indirect Pipeline Alternative

The direct impacts of Alternative 2 would be similar to those described for the Proposed Action because the construction processes would be very similar, with the same type and quantity of equipment required, and with the loudest construction processes taking place at the intake site, at the same distance from sensitive receptors. A difference between this alternative and the Proposed Action is the greater proximity of the pipeline alignment to the temporary seasonal farmworker housing, which could be exposed to high noise levels when construction is conducted nearby. In addition, the duration of pipeline construction would be greater because of the greater length of pipeline. The same mitigation measure would apply to reduce the effects of the generation of short-term construction noise to a less-than-significant level. Alternative 2 would not contribute to any significant cumulative noise impact.

4.11.2.6 Alternative 3, Modified Operations Alternative

The direct and cumulative impacts of Alternative 3 would be the same as those described for the Proposed Action. Implementation of the same mitigation would reduce the impact of generation of short-term construction noise to a less-than-significant level. Alternative 3 would not contribute to any significant cumulative noise impact.

4.11.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.11-a (Alternative 4)

Generation of Short-Term Construction Noise. *Construction of the Desalination Alternative could generate noise levels that exceed Contra Costa County significance threshold standards at nearby sensitive receptors if construction activities are carried out during noise-sensitive hours, causing sleep disturbance and/or annoyance. This direct impact would be* ***potentially significant****.*

The construction of the new desalination treatment facility (at Bollman WTP) and intake and pump station (at Mallard Slough) would each be within about 3,000 feet of sensitive receptors. Generally, the same construction equipment described above for the Proposed Action would be required to construct facilities for the Desalination Alternative. The simultaneous operation of the on-site heavy-duty equipment associated with this alternative could potentially result in combined intermittent noise levels of approximately 101 dBA at 50 feet from the project construction site. Based on these equipment noise levels and assuming a noise attenuation rate of 6 dBA per doubling of distance from the source, no noise-control devices, and no intervening barriers, exterior noise levels at the nearest sensitive receptors located within approximately 3,000 feet of the Desalination Alternative project sites would experience worst-case sound levels of 65 dBA.

The installation of the new untreated-water conveyance pipeline connecting the intake facility to the new desalination treatment facility would take place immediately adjacent to residential dwellings and would involve removal and reconstruction of some roadways. This would involve associated paving equipment and jackhammers and would inevitably cause substantial increases in noise levels at neighboring residences.

If construction operations were not limited to normal working hours, the temporary construction-generated noise associated with on-site equipment would likely expose sensitive receptors to substantial increases in noise levels (5 dBA or greater). Because these circumstances could result in noise levels that exceed the applicable standards, resulting in increased annoyance and/or sleep disruption to occupants of residential dwellings, this direct impact would be potentially significant.

IMPACT 4.11-b (Alternative 4)

Generation of Long-Term Operational Noise. *Implementation of the Desalination Alternative would contribute negligibly to an increase in traffic noise levels. It would also introduce stationary noise sources; however, these sources would not create off-site noise levels that exceed applicable standards at sensitive receptor locations. This direct impact would be* ***less than significant****.*

The new desalination treatment facility would operate 24 hours a day, averaging 4 months of use per year, and may require an increase of fewer than 10 staff at the Bollman WTP. Assuming two total trips per day per employee (assuming an 8-hour shift), operation of the facility would result in a maximum of approximately 60 additional one-way trips per day. Noticeable increases typically occur with a doubling of roadway traffic volumes and when volumes are already high. Noise impacts on sensitive receptors (i.e., greater than 60 dBA CNEL/L_{dn}) do not typically occur until several thousand

vehicles are on a roadway. Because of the low project-generated traffic volumes, operation of this alternative would not result in a noticeable increase (i.e., 5 dBA or greater) in average daily traffic noise levels at nearby receptors.

The Desalination Alternative would involve the long-term operation of noise-generating stationary equipment at the expanded Mallard Slough pump station. Without proper noise control or enclosure, such equipment could result in noise levels ranging from 78–88 dBA at 3–5 feet from the source, depending on the exact type and size (EPA 1971). However, the pump station would be enclosed in a concrete structure, resulting in exterior noise levels below 50 dBA at 50 feet. In addition, this facility would be located in industrial-zoned land-uses. Equipment at the desalination plant itself would generate noise during the treatment processes, but the equipment would be enclosed in buildings that would shield surrounding receptors from the noise. There would be no noise associated with the untreated-water conveyance and concentrate disposal pipelines once installed. The only other increase in stationary and area-source noise associated with this alternative would be the operation of mechanical equipment, such as an emergency standby generator installed at the new electrical substation. The generator would be used infrequently in emergency situations, and would be sufficiently far from sensitive receptors that they would be unaffected by its use. Because new stationary sources would be enclosed in permanent structures or equipped with appropriate noise attenuation measures, off-site noise levels would not be anticipated to differ substantially from existing noise levels. Thus, operational noise levels associated with implementation of the Desalination Alternative would not exceed the applicable threshold of a 5-dBA increase in ambient noise levels.

The impact of the Desalination Alternative on long-term noise levels would be less than significant.

IMPACT 4.11-c (Alternative 4)

Exposure of Sensitive Receptors to or Generation of Excessive Ground-Borne Vibration or Noise. *Construction of the Desalination Alternative could have the potential to result in the generation of excessive ground-borne vibration or ground-borne noise levels at 25 feet from the source equipment. However, because no structures are located immediately outside the project boundaries, it is unlikely that any structural or architectural damage would occur as a result of the associated ground-borne vibration levels. This direct impact would be* ***less than significant****.*

Construction operations associated with the Desalination Alternative would be anticipated to include pile drivers, bulldozers, backhoes, loaders, jackhammers, and trucks. Ground-borne noise and vibration resulting from construction of the Desalination Alternative would be primarily associated with the use of pile drivers, which typically result in relatively high levels of ground-borne vibration at 25 feet from the source, as shown in Table 4.11-4. However, because the nearest structures would be located sufficiently far from the Mallard Slough and Bollman WTP construction sites, these levels would not likely result in vibration levels in excess of the most conservative threshold of 0.2 inch per second ppv.

Construction of the new untreated-water conveyance pipeline would involve the demolition of some residential roadways, which would involve jackhammering and paving activity. These processes would be conducted immediately adjacent to existing structures and residential dwellings, but because vibration levels associated with the necessary equipment are already less than 0.2 inch per second ppv at 25 feet, they would not result in vibration levels in excess of the most conservative threshold of 0.2 inch per second ppv. Thus, the temporary construction vibration associated with the operation of on-site equipment would not be anticipated to cause structural or architectural damage or expose sensitive receptors to excessive ground-borne noise levels. As a result, this direct impact would be less than significant.

Cumulative Impacts

The Desalination Alternative would result in a significant noise impact associated with short-term construction activities. Impacts associated with long-term operational traffic and stationary noise sources would be minor, as would excessive ground-borne vibration or noise impacts.

Noise is a localized occurrence and attenuates with distance. Therefore, only future cumulative development projects in the direct vicinity of the project sites would have the potential to add to anticipated stationary project-generated noise, thus resulting in cumulative noise impacts. No related projects are known to be planned in the direct vicinity of the Desalination Alternative (see Section 4.1.3, "Cumulative Impact Analysis," and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis").

Because no related projects would be under construction in the direct vicinity of the project site concurrently with the Desalination Alternative, it would not cause a cumulatively considerable incremental contribution to any such significant cumulative noise impacts.

Mitigation Measures

Mitigation Measure 4.11-a (Alternative 4): Implement Measures to Control Generation of Short-Term Construction Noise.

CCWD shall ensure that the following measures are implemented during construction:

- Construction equipment shall be fitted with feasible noise-control devices as presented in Table 4.11-3.
- Construction operations shall be limited to normal working hours in all areas where construction noise levels could disturb sensitive receptors (i.e., along the untreated-water pipeline alignment where it passes through residential neighborhoods and at the Bollman WTP and Mallard Slough sites).

Implementation of these measures would reduce construction noise levels to a less-than-significant level.

4.12 Utilities and Service Systems

Utilities and service systems of potential relevance to the Proposed Action and alternatives include water, wastewater, electrical and natural gas, solid waste, fire, and police services. Effects of the project on stormwater drainage are addressed in Section 4.3, "Local Hydrology and Water Quality."

4.12.1 Affected Environment

4.12.1.1 Regulatory Setting

There are no Federal, State, or local laws or regulations pertaining to utilities, service systems, and waste disposal that are relevant to this analysis.

There are no specific local general plan policies that apply to the Proposed Action or alternatives. The Public Facilities/Services Element of the *Contra Costa County General Plan* (Contra Costa County 2005) sets county goals for emergency service response times and staffing and promotes the consideration of utility services in county and city land use planning and permitting activities. The Public Health and Safety, Resources, and Community Development Elements of the *San Joaquin County General Plan* (San Joaquin County 1992) contain policies and objectives that encourage the minimization of nonrenewable-energy consumption, promote solid waste source reduction and the environmentally safe transformation of wastes, and encourage siting utility facilities such that interference with existing land uses is minimized.

The Public Services Element of the *City of Concord General Plan* (City of Concord 1994) contains policies promoting coordination with appropriate service providers to ensure that adequate utility and service systems are maintained. It also includes general policies directing that the city provide a high level of police protection and that sufficient access for fire protection services is available. The Public Facilities Element of the *City of Pittsburg General Plan* (City of Pittsburg 2004) contains general direction to promote the importance of recycling industrial and construction wastes.

4.12.1.2 Environmental Setting

Victoria Island/Byron Tract

Water and Wastewater

Neither Contra Costa County nor San Joaquin County maintains domestic water infrastructure at the proposed project site. Most of the rural portions of eastern Contra Costa County and the Delta area of San Joaquin County use private groundwater wells as their source of drinking water.

4.12 Utilities and Service Systems

The portion of the proposed project site on Byron Tract, in Contra Costa County, is not part of a sanitary service district. San Joaquin County does not maintain wastewater services on Victoria Island. Smaller communities and individual homes in the Delta use septic tanks and leach fields for wastewater disposal.

Solid Waste

Communities in the Delta are served by refuse disposal companies that transport solid waste to landfill sites outside the Delta.

Waste collection services and disposal facilities in Contra Costa County are privately owned. There are three landfills and four transfer stations in Contra Costa County. The transfer station closest to the proposed project site in Contra Costa County is the Brentwood Transfer Station, which is about 7 miles away. The closest landfill is the Keller Canyon Landfill, which is about 18 miles away.

In San Joaquin County, solid waste is transported by collection agencies or individuals either directly to landfills or to transfer stations. Victoria Island is located in the Central County Region, which uses the county-owned Lovelace Transfer Station and disposes of waste in the Foothill Landfill east of Lodi. The Lovelace Transfer Station and Foothill Landfill are about 15 miles east and about 35 miles northeast of Victoria Island, respectively. The Forward Landfill in Manteca and the North County Recycling Center and Sanitary Landfill east of Linden are also within 40 miles of the proposed project site. Table 4.12-1 presents the capacities of these landfills.

Table 4.12-1
Capacities of Landfills Near Victoria Island and Byron Tract

Landfill	Total Permitted Landfill Capacity (Cubic Yards)	Landfill Capacity Remaining (Cubic Yards)[1]
Keller Canyon Landfill	75,018,280	68,279,670
Foothill Landfill	102,000,000	94,969,466
Forward Landfill	51,040,000	40,031,058
North County Recycling Center and Sanitary Landfill	17,300,000	13,239,032

[1] Values of remaining landfill capacity are from June 6, 2001, for Keller Canyon Landfill; May 22, 2001, for Foothill Landfill and North County Recycling Center and Sanitary Landfill; and June 1, 2002, for Forward Landfill.

Source: California Integrated Waste Management Board 2004

Energy

Pacific Gas and Electricity Company (PG&E) provides electricity in the vicinity of the proposed project site. PG&E obtains its energy supplies from hydroelectric, nuclear, and gas-fired power plants in northern and central California and from energy purchased from out of state and delivered through high-voltage transmission lines. In 2001, PG&E delivered approximately 76 million megawatt hours (MWh) to 4.8 million customers

(PG&E 2003). PG&E owns or leases 8,255 megawatts (MW) of power-generating capacity.

In addition to PG&E, CCWD obtains electricity from both the Central Valley Project (CVP) and Modesto Irrigation District (MID) at some of its eastern Contra Costa County facilities, including the Old River Pump Station. Energy from these sources may be available at the proposed project site. Authorized in 1935, the CVP is a multi-purpose Reclamation project consisting of a system of water storage and conveyance facilities designed to serve a variety of purposes, including, but not limited to, power production, managing water use and deliveries for irrigation and municipal purposes, and meeting specific environmental requirements. The CVP system of hydroelectric facilities generates power primarily for use by Reclamation in support of pumping requirements as well as providing power to Reclamation contractors, such as CCWD, for use in delivering CVP water. The CVP generates 5.6 million MWh of electricity annually to serve the needs of about 2 million people.

MID was established in 1887 as an irrigation district and began providing electric services in 1923. In 2004, MID provided electric service to more than 106,000 electrical customers. MID produces 16% of its electrical generation capacity and 84% is purchased from other sources. Sources of energy include hydropower, natural gas, and coal generation plants. In 2004, MID consumed 2.36 million MWh of electricity (Hawkins, pers. comm., 2005).

Electrical transmission and distribution lines cross the proposed project site and generally serve agricultural buildings and supporting infrastructure. The existing Old River intake and pump station on Byron Tract is served through a dedicated Western Area Power Authority (WAPA) distribution line. A WAPA overhead high-voltage power line extends in a north-south alignment across the eastern side of Victoria Island, with large transmission towers located at intervals along the power line corridor. Additionally, there are smaller PG&E overhead power lines and telephone lines located along the north levee side of Victoria Canal and also that extend from State Route (SR) 4 west and southwest to the ditch pumping station and the farm housing along the levee on Old River, respectively. Buried utility infrastructure at Victoria Island includes fiber-optic cable along the southern side of SR 4, but north of the pipeline alignment for the Indirect Pipeline Alternative.

Police and Fire Protection

The Contra Costa County Sheriff's Department provides service to unincorporated areas of Contra Costa County, including Byron Tract. The Sheriff's Department also provides marine patrol services to more than 200 miles of linear coastline. The San Joaquin County Sheriff's Department provides law enforcement in unincorporated portions of San Joaquin County, including Victoria Island. The California Highway Patrol manages traffic on State roadways, including SR 4. The San Joaquin County Sheriff's Department also staffs a boating safety unit, which provides law enforcement services covering more than 700 miles of rivers and waterways. The San Joaquin County Sheriff's Department is designated as "scene manager" in disasters ranging from toxic spills to major flood

activity. The U.S. Coast Guard has guard vessels stationed at Rio Vista, which provide limited patrol for the entire Delta region.

Fire protection for eastern Contra Costa County is provided by the East Contra Costa Fire Protection District. The fire station closest to the proposed project site is located at Discovery Bay, approximately 2 miles northwest of the proposed project site. Victoria Island, in San Joaquin County, is not under the jurisdiction of any fire protection district.

Desalination Alternative Project Sites

Water and Wastewater
Water supply for Concord, including the Bollman WTP site, is provided by CCWD. Water supply in Bay Point, where the Mallard Slough intake and pump station is located, is provided by Southern California Water Company, which purchases untreated water from CCWD.

The City of Concord Sanitary Service operates the sewage collection system for Concord, including the Bollman WTP area; the waste is treated by the Central Contra Costa Sanitary District. The Delta Diablo Sanitation District owns and operates the sewage collection and treatment system in Bay Point.

Solid Waste
It is estimated that residents, businesses, and industries in Contra Costa County generate more than 1,300,000 tons of solid waste annually (Contra Costa County 2005). Waste disposal facilities in Contra Costa County, as well as collection services, are privately owned.

Solid waste collection, disposal, and recycling services in Concord are provided by Concord Disposal Service. Solid waste pickup and disposal services for Pittsburg and Bay Point are provided by Pittsburg Disposal Services and Allied Industries. Industrial waste from the Concord and Bay Point areas is transported to Keller Canyon Landfill. This landfill has a total permitted capacity of 75,018,280 cubic yards, of which 68,279,670 cubic yards remained in June 2001 (California Integrated Waste Management Board 2004).

Energy
PG&E distributes electrical power to the Desalination Alternative project sites.

Police and Fire Protection
The Concord Police Department provides services to the City of Concord. The Contra Costa County Sheriff's Department provides police protection services for Bay Point. The Pittsburg Police Department provides police services for the City of Pittsburg.

Fire protection services for Concord, Pittsburg, and Bay Point are provided by the Contra Costa County Fire Protection District.

4.12.2 Environmental Consequences

4.12.2.1 Methods and Assumptions

This evaluation is based on a review of EIRs prepared for other projects in the project area, local general plans, and telephone conversations with personnel from public works agencies.

4.12.2.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on Appendix F (Energy Conservation) and Appendix G (Environmental Checklist) of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. An alternative was determined to result in a significant effect on utilities and public services if it would:

- disrupt utility service (e.g., interfere with emergency services or evacuation plans) such that a public health hazard could be created or an extended service disruption could result;
- increase energy use beyond local or regional resources or result in wasteful, inefficient, or unnecessary consumption;
- require the construction of additional energy infrastructure facilities that would have significant environmental effects;
- generate waste materials that would exceed the permitted capacity of local landfills;
- result in substantial adverse physical impact associated with the provision of new or altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for public services such as fire protection, police protection, schools, or parks;
- exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- exceed water supplies available to service the project from existing entitlements and resources, such that new or expanded entitlements would be needed; or
- result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

Section 4.9, "Transportation and Circulation," addresses the potential of the Proposed Action and alternatives to temporarily affect emergency response times and access during construction. As described in that section, the Proposed Action and Alternatives 2 and 3 would not have a significant effect on emergency services. Construction activities for Alternative 4 could significantly affect emergency response times, but mitigation is provided that would reduce this potential to a less-than-significant level. None of the alternatives would have an effect on emergency service performance objectives during construction such that additional services and new facilities would be required. Neither the Proposed Action nor any alternative would directly or indirectly result in population growth. Therefore, the project would not increase long-term demand for public services, including fire and police protection, additional schools, parks, and other public facilities, that would necessitate the construction of new or altered government service facilities. For these reasons, no further discussion of such effects is required.

As described in Chapter 3, "Alternatives, Including the Proposed Action," the alternative intake and pumping facilities (Proposed Action and Alternatives 2 and 3) would be monitored routinely by CCWD personnel, but would not be staffed with on-site personnel. On-site water and wastewater needs would be minimal. Water from Victoria Canal would be pumped through a screening filter to provide non-potable service water for the pump seals and washrooms. Sanitary services for CCWD personnel would be provided through the use of a below-ground holding tank that would be regularly maintained. The construction-related impacts associated with the installation of new on-site water and wastewater utilities have been evaluated in other sections of this EIR/EIS. Under Alternative 4, the desalination facility would be constructed at Bollman WTP, which currently maintains adequate water and wastewater facilities for CCWD personnel. No changes to the existing water and wastewater facilities are anticipated with implementation of this alternative. The new intake at Mallard Slough would be operated remotely and therefore would not require the construction of water and wastewater facilities. Thus, water and wastewater services are not discussed further in this section.

There are no standards that indicate what is meant by "wasteful, inefficient, or unnecessary consumption" of energy. For the purposes of this EIR/EIS, an alternative would be considered to use fuel or energy in a wasteful manner if it would use energy in a manner inconsistent with common energy conservation practices. In addition, an alternative would be deemed to have a significant impact if substantial changes in existing utility infrastructure were needed to accommodate increased electricity demand.

4.12.2.3 No-Action Alternative

Under the No-Action Alternative, no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Implementation of the No-Action Alternative would neither temporarily nor permanently affect utilities and service systems. The No-Action Alternative would have no direct or indirect effect on utilities and services systems and would not contribute to any cumulative impacts.

4.12.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.12-a (Alternative 1)

Temporary Disruption of Utility Services during Construction. *Utility infrastructure on the proposed project site, both above-ground and buried, is well documented and would be avoided or temporarily relocated during construction activities. Project construction activities would not result in damage to utility infrastructure or disruption of utility service. This impact would be* ***less than significant****.*

As described above, electrical transmission and distribution lines cross the proposed project site and generally serve agricultural buildings and support infrastructure. An overhead high-voltage power line extends in a north-south alignment across the eastern side of Victoria Island, with large transmission towers located at intervals along the power line corridor. Additionally, there are smaller overhead power lines and telephone lines located along the north levee side of Victoria Canal and also that extend from SR 4 west and southwest to the ditch pumping station and the farm housing along the levee on Old River, respectively.

Buried utility infrastructure at Victoria Island includes fiber-optic cable along the southern side of SR 4. The location of these facilities is well documented, and the infrastructure would not be disturbed by construction activities.

The final alignment of the proposed project facilities would be located to avoid or minimize impacts to existing utility infrastructure. Where construction activities do encroach upon these utilities, they would be temporarily relocated to avoid any disturbance.

Because above-ground and buried utilities would be avoided or temporarily relocated during construction activities, project construction is unlikely to result in damage to utility infrastructure or disruption of utility service. This impact would therefore be less than significant.

IMPACT 4.12-b (Alternative 1)

Increases in Energy Consumption. *Project-related electrical demands would represent only an incremental increase over existing energy consumption that would not exceed the resources of the applicable energy providers or be wasteful, inefficient, or unnecessary. This impact would be* ***less than significant****.*

The proposed new pump station on Victoria Canal would require electrical power from PG&E, CVP, MID, or some combination of these sources. The Old River pump station uses as much as 345 kilowatt-hours (kWh) per acre-foot of water. It is anticipated that pumping water from the new Victoria Canal pump station may use as much as 395 kWh per acre-foot of water, a net increase of 55 kWh/acre-foot, or about 15%. Therefore, although the total amount of water pumped at the two stations would not increase above 250 cfs, the overall energy use could increase by as much as approximately 15% with implementation of the Proposed Action when water is pumped exclusively from Victoria Canal in place of water pumped at the Old River pump station from Old River. The existing Old River pump station uses approximately 30,000 MWh per year. With a

portion of the Old River pumping relocated to a new pump station at Victoria Canal, the total energy used between Old River and Victoria Canal pump station would be up to 34,500 MWh per year, or a maximum increase of 15%. According to the California Energy Commission (2004a, 2004b), California had an annual energy production of 222,593,000 MWh for 2003 and an electrical generation capacity of 62,182 MW as of July 1, 2004. Based on the most recent data on energy production, the total annual additional energy required for the Proposed Action would be 0.015% of California's electrical generation capacity, 0.003% of PG&E's capacity, 0.08% of the CVP capacity, and 0.2% of MID's capacity. The incremental increase in energy used by the proposed facilities would be a small portion of the energy capacity of the existing energy providers, and energy use at the proposed facilities would be consistent with common energy conservation practices.

As described in Chapter 3, "Alternatives, Including the Proposed Action," a new power substation would be constructed on-site, and power transmission lines would be installed from either the PG&E or WAPA distribution system to the substation. Potential corridors for power lines are the same as for the pipeline, and the construction timeframe would be the same as described for the Proposed Action. Therefore, construction-related impacts associated with the installation of new on-site electrical facilities are covered by the evaluation of construction impacts of the project facilities presented in other sections of this EIR/EIS. No additional energy infrastructure would need to be provided to meet the energy needs of the Proposed Action.

Effects of the Proposed Action related to energy use would be less than significant.

IMPACT 4.12-c (Alternative 1)

Increases in Solid Waste Generation. *Construction of the proposed facilities would not generate construction waste materials that would exceed the capacity of local landfills, and operation of the proposed water intake and pump station would result in minimal waste. This impact would be* ***less than significant****.*

Construction of the proposed facilities would generate construction waste materials. Unused excavated materials (i.e., non-select materials that are not suitable for the new levee berm or pipe backfill) would remain on-site. Other construction debris (e.g., miscellaneous wood scraps, metals, packaging materials for equipment, etc.) would likely amount to less than 1 ton per month. Operation of the proposed facilities would generate a minor amount of waste.

Foothill Landfill serves the portion of the proposed project site located in San Joaquin County (i.e., the Victoria Island portion), and several other landfills, including Forward, Inc., and North County Recycling Center and Sanitary Landfill are located near the site. As shown in Table 4.12-1, all of these facilities have adequate capacity. Project construction and operation would not cause this capacity to be exceeded. This impact would be less than significant.

Cumulative Impacts

Any inadvertent disruptions of utility service caused by project construction activity would be temporary and intermittent. Adequate landfill capacity exists in the project

region to accommodate project-generated waste, as well as additional waste from other new temporary and long-term sources. Therefore, the Proposed Action would not contribute to cumulative impacts related to emergency services, utility services, or waste facilities.

Cumulative impacts on energy use are considered in the context of the service area of service providers. The potential increase in local energy use that could result from operation of the proposed facilities is a minor increment of the total capacity of the relevant service providers. The Proposed Action would not result in a cumulatively considerable contribution to any significant cumulative impact on energy generation or energy-production facilities.

Mitigation Measures

No mitigation is required.

4.12.2.5 Alternative 2, Indirect Pipeline Alternative

The direct, indirect, and cumulative impacts of Alternative 2 would be the same as those described for the Proposed Action. Any impacts of Alternative 2 on utilities and public services would be less than significant.

4.12.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 would be the same as those described for the Proposed Action. Although modifying operations would result in changes to the energy usage of CCWD's pump stations, any increases resulting from the shifted energy usage would be minor and within the increased energy usage estimates given for Alternative 1. Any impacts of Alternative 3 on utilities and public services would be less than significant.

4.12.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.12-a (Alternative 4)

Temporary Disruption of Utility Services during Construction. *Utility infrastructure on the Desalination Alternative project sites could be damaged during project construction activities, potentially resulting in disruptions in service. This impact would be* ***potentially significant.***

The Desalination Alternative would be located in areas with overhead and buried utility lines. During project construction, this utility infrastructure could be damaged, potentially resulting in temporary service disruptions. Because the precise location of this infrastructure in relation to the Desalination Alternative project sites is unknown at this stage of project development and because the potential exists for construction activities to interfere with utility infrastructure, and, thus, service, during construction operations, this impact would be potentially significant.

IMPACT 4.12-b (Alternative 4)

Increases in Energy Consumption. *Project-related electrical demands would represent only an incremental increase over existing energy consumption and would not exceed the resources of the applicable energy providers. This impact would be* ***less than significant****.*

The Desalination Alternative would use electrical power to pump water from Mallard Slough, convey it to the new treatment facility, and process it into potable water. The annual electricity demand for a desalination treatment facility with a capacity of 80–85 mgd and associated conventional intake, pretreatment, and untreated-water conveyance would be approximately 65–85 MW. Assuming operations 24 hours per day and an average of 4 months of use per year, the daily energy consumption for the desalination facilities would be approximately 1,600 to 2,100 MWh per day, which amounts to as much as 252,000 MWh per year.

Energy use under this alternative would be consistent with common energy conservation practices. The total annual energy required for this alternative would constitute about 0.11% of California's electrical generation capacity in 2004 or 0.33% of PG&E's electrical generation capacity in 2001.[1]

Electrical services would be provided by PG&E, which produces electricity by using both nonrenewable and renewable fuel sources, and obtains electricity from other generators that also use both nonrenewable and renewable fuel sources. This alternative would not substantially increase demand on the existing electrical generating capacity of PG&E or its providers. Furthermore, this alternative would not change PG&E operations and therefore would not increase reliance on nonrenewable energy sources.

Existing PG&E electrical transmission lines located at or near both Mallard Slough and Bollman WTP would be used to provide the required power to the Mallard Slough pump station and the new desalination treatment facility at Bollman WTP. Because of the high capacity requirements for the desalination treatment facility and conveyance pumping, new power feeds would be required at the Bollman WTP. For the Mallard Slough pump station, PG&E currently supplies 21 kilovolt, three-phase power, which would be able to provide the required power for the expanded pump station. This alternative would not create a substantial burden on the existing electrical system and would not necessitate the development of additional power generation facilities. Therefore, this impact would be less than significant.

[1] Percent of California's electrical generation capacity used = (252,000/222,593,000) x 100 = 0.11%. Percent of PG&E's electrical generation capacity used = (252,000/76,000,000) x 100 = 0.33%.

IMPACT 4.12-c (Alternative 4)

Solid Waste Generation. *Construction of the Desalination Alternative would not generate construction waste materials that would exceed the capacity of local landfills. Operation of the new desalination treatment facility would produce waste solids that would be disposed of at a local landfill. This impact would be* ***less than significant.***

Construction activities associated with the Desalination Alternative would generate construction waste materials, but construction would not be expected to generate enough waste such that the daily limits or capacities of local landfills would be exceeded. Unused excavated materials would remain on-site. Other construction debris (e.g., miscellaneous wood scraps, metals, packaging materials for equipment, etc.) would likely amount to less than 1 ton per month. The local landfill facilities, particularly Keller Canyon Landfill, have adequate capacity to serve the Desalination Alternative.

CCWD currently discharges waste solids (i.e., suspended solids and pretreatment flocculant solids) generated at the Bollman WTP off-site to a lagoon-type storage system for drying and disposal that is located at the Central Contra Costa Sanitation District treatment facility. Solids generated by the desalination pretreatment and treatment processes would be disposed of in the same manner using the existing facilities.

The lagoon storage system is a passive system for draining and air drying the waste solids. Once dry (approximately 35–50% solids concentration), the solids are removed for disposal at a local landfill site. The removal and disposal operations are typically completed six to eight times per year. Approximately 25,000–35,000 cubic yards of additional solids would be produced each year as a result of the desalination process. As local landfills have adequate capacity to serve the waste solids handling of the new desalination treatment facility, this impact would be less than significant.

Cumulative Impacts

Any inadvertent disruptions of utility service caused by project construction activity would be temporary and intermittent. Adequate landfill capacity exists in the project region to accommodate project-generated waste as well as additional waste from other new temporary and long-term sources. Therefore, the Desalination Alternative would not contribute to cumulative impacts related to emergency services, utility services, or waste facilities.

Cumulative impacts on energy use are considered in the context of the service area of service providers. The potential increase in local energy use that could result from operation of the Desalination Alternative project facilities is a minor increment of the total capacity of the relevant service providers. The Desalination Alternative would not result in a cumulatively considerable contribution to any significant cumulative impact on energy generation or energy-production facilities.

Mitigation Measures

Mitigation Measure 4.12-a (Alternative 4): Reduce the Potential for Damage to Existing Utilities. The following measures shall be implemented during project construction to ensure that existing utilities are not damaged and service disruptions do not occur:

- CCWD shall obtain utility excavation or encroachment permits as necessary before initiating any work with the potential to affect utility lines, and shall include all necessary permit terms in construction contract specifications.
- Utility locations shall be verified through field surveys and the use of the Underground Service Alert services. Any buried utility lines shall be clearly marked in the area of construction in advance of any earth-moving activities.
- The construction contractor shall prepare a response plan to address potential accidental damage to a utility line. The plan shall identify chain of command rules for notification of authorities and appropriate actions and responsibilities to ensure the safety of the public and workers. Worker education training in response to such situations shall be conducted by the contractor.

Implementation of this measure would ensure that existing utilities are not damaged and service disruptions do not occur. Implementation of this measure would reduce the potential for utility disruption to a less-than-significant level.

4.13 Hazardous Materials

This section includes an evaluation of potential hazardous material and public health impacts from project implementation. The hazardous materials analysis is based in part on regulatory database searches performed by Environmental Data Resources (EDR) in May 2005.

4.13.1 Affected Environment

4.13.1.1 Regulatory Setting

Federal

Hazardous Materials Handling
At the Federal level, the principal agency regulating the generation, transport, and disposal of hazardous substances is the U.S. Environmental Protection Agency (EPA), under the authority of the Resource Conservation and Recovery Act (RCRA). The RCRA established an all-encompassing Federal regulatory program for hazardous substances that is administered by EPA. Under the RCRA, EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous substances. The RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments of 1984, which specifically prohibits the use of certain techniques for the disposal of various hazardous substances. The Federal Emergency Planning and Community Right to Know Act of 1986 imposes hazardous materials planning requirements to help protect local communities in the event of accidental release.

Worker Safety Requirements
The U.S. Department of Labor Occupational Safety & Health Administration (OSHA) is responsible at the Federal level for ensuring worker safety. OSHA sets Federal standards for implementation of workplace training, exposure limits, and safety procedures for the handling of hazardous substances (as well as other hazards). OSHA also establishes criteria by which each state can implement its own health and safety program.

State

Hazardous Materials Handling
The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires preparation of Hazardous Materials Business Plans and disclosure of hazardous materials inventories. A Business Plan includes an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures (California Health and Safety Code, Division 20, Chapter 6.95, Article 1). Statewide, the California Department of Toxic Substances Control (DTSC)

has primary regulatory responsibility for management of hazardous materials, with delegation of authority to local jurisdictions that enter into agreements with the State. Local agencies, including the San Joaquin and Contra Costa County Departments of Environmental Health, administer laws and regulations under DTSC's authority.

Worker Safety Requirements
The California Occupational Safety and Health Administration (Cal-OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within California. Cal-OSHA regulations pertaining to the use of hazardous materials in the workplace, as detailed in CCR Title 8, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal-OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparing health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets be available to employees and that employee information and training programs be documented.

Local
The Contra Costa County Hazardous Waste Management Program and the general plans of Contra Costa and San Joaquin Counties, Pittsburg, and Concord contain general policies aimed at reducing the use of hazardous substances and the generation of hazardous waste and ensuring safe use and storage of hazardous materials and management of hazardous waste in the project area. Consistency with these policies would be achieved through compliance with the State and Federal regulations described above and Federal and State regulations for the protection of water quality described in Section 4.5, "Local Hydrology and Water Quality."

4.13.1.2 Environmental Setting
Hazardous materials and hazardous wastes are classified by the State of California according to four properties: toxicity, ignitability, corrosivity, and reactivity. A material so classified is defined as a substance or combination of substances that may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating illness, or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed (22 CCR 66261.10). Hazardous wastes are hazardous substances that no longer have practical use, such as materials that have been discarded, discharged, spilled, or contaminated or are being stored until they can be disposed of properly.

In addition to hazardous materials, wildfires also pose a threat to both persons and property in many areas of California. According to the *San Joaquin County General Plan*, human activities such as smoking, debris burning, and equipment operation are the major causes (90%) of wildland fires (San Joaquin County 1992). Wildland fires are a particularly dangerous hazard to development located in forest and shrub areas. The severity of wildland fires is influenced by four primary factors: vegetation, climate, slope,

and people. The California Department of Forestry and Fire Protection (CDF) has developed a fire hazard severity scale, which considers vegetation, climate, and slope to evaluate the level of wildfire hazard in all State Responsibility Area lands. CDF designates three levels of Fire Hazard Severity Zones (Moderate, High, and Very High) to indicate the severity of fire hazard in a particular geographical area (CDF 2001).

Victoria Island/Byron Tract

Existing land uses on the proposed project site and in the surrounding area consist primarily of agriculture. An equipment yard and CCWD's Old River intake and pump station are located adjacent to Old River on Byron Tract. State Route (SR) 4, which forms the northern boundary of the proposed project site, is identified in the *San Joaquin County General Plan* (San Joaquin County 1992) as a hazardous waste transportation route. A petroleum product pipeline runs about 3 miles west of the proposed tie-in with the existing Old River conveyance facilities (Contra Costa County 2005).

A hazardous materials records search of the proposed project site and areas within 0.25 mile of the site was performed by EDR for this study. The purpose of the search was to identify documented "recognized environmental conditions" (RECs) at and near the proposed project site related to current and historical uses of the area and to evaluate the potential for a release of hazardous materials from on- or off-site sources that could significantly affect environmental conditions at the proposed project site. EDR searched a variety of Federal and State databases such as the National Priorities List; the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLA); RCRA information; and DTSC's Hazardous Waste & Substances Site (known as the "Cortese list"), among others. According to the EDR database search, there are no known or potentially hazardous waste sites, landfills, hazardous waste generators, or disposal facilities within 0.25 mile of the proposed project site (EDR 2005).

Byron Airport is about 3.5 miles south of the proposed project site, west of Clifton Court Forebay. No schools are located in the vicinity of the proposed project site.

Desalination Alternative Project Sites

The Desalination Alternative project sites are located in north-central Contra Costa County, including portions of Concord and the communities of Bay Point and Clyde. Industrial land uses in the vicinity of the Bollman Water Treatment Plant (WTP) site, where the new desalination facility would be constructed, include oil storage tanks 0.8 mile to the west, the Buchanan Field airport 1.6 miles to the southwest, and the U.S. Naval Weapons Station (Concord) 1.6 miles to the southeast. Commercial and industrial land uses are the most likely to use and store large quantities of hazardous materials, and hence are more likely than other land uses to be sources of potentially hazardous chemical spills. Land uses along the route of the untreated-water conveyance pipeline that would be constructed under the Desalination Alternative include industrial parks, residential housing, roadways, and the Contra Costa Canal.

Several schools in the Mount Diablo Unified School District are located near the untreated-water conveyance pipeline corridor: Willow Cove Elementary (0.5 mile), Bel Air Elementary (0.07 mile), Rio Vista Elementary (0.1 mile), Shore Acres Elementary

(0.25 mile), Delta View Elementary (1 mile), and Riverview Junior High School (0.2–0.4 mile). There are no schools within 2 miles of Bollman WTP.

A hazardous materials study, consisting of a Phase I data review and Phase II field investigation (and laboratory testing), was recently performed by URS Greiner Woodward Clyde for CCWD's Multi-Purpose Pipeline Project (CCWD 2000). This study is also relevant to the present evaluation, as the study area included the Contra Costa Canal corridor, a portion of which would also serve as the corridor for a part of the untreated-water conveyance pipeline. Analysis of the study results showed that at most of the sampling locations, the detected chemical concentrations were below conservative screening concentrations, indicating that there is no significant concern for risk to human health. However, at two locations, several metals exceeded the EPA's Preliminary Remediation Goals (PRGs) for residential or industrial soil (CCWD 2000). Based upon the available information, it was concluded that the potential for encountering hazardous materials in the area of the Contra Costa Canal is low but that it is possible that contaminated soil and groundwater may exist between sampling locations (CCWD 2000). Therefore, it is possible that contaminants could be encountered during construction of the untreated-water conveyance pipeline for the Desalination Alternative. No hazardous materials study results were available for other Desalination Alternative project sites.

4.13.2 Environmental Consequences

4.13.2.1 Methods and Assumptions

EDR conducted a regulatory database search for the area within a 0.25-mile radius surrounding the proposed project site, which includes the southwest portion of Victoria Island and the eastern portion of Byron Tract (EDR 2005). The purpose of such a search is to identify sites in the target area that are associated with the documented use, generation, storage, or releases of hazardous materials or petroleum products. The report also includes regulatory agency lists of known or potential hazardous waste sites, landfills, hazardous waste generators, and disposal facilities, in addition to sites under investigation. Information provided in the EDR database search was obtained from publicly available sources, including the following:

- Cortese List – Governor's Office of Planning and Research;
- Leaking Underground Storage Tanks – RWQCB;
- Comprehensive Environmental Response Compensation and Liability Information System – EPA Superfund Sites;
- National Priority List – EPA Priority Superfund Sites; and
- Annual Work Plan – California Environmental Protection Agency (Cal/EPA).

A regulatory database search was not conducted for the Desalination Alternative project sites as part of this evaluation because of the geographical extent of the sites. The

preliminary evaluation of the potential for hazardous materials to be encountered at the Desalination Alternative project sites was assessed based on observations of existing land uses and review of the hazardous materials evaluation performed for the Multi-Purpose Pipeline Project (CCWD 2000).

4.13.2.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. An alternative was determined to result in a significant effect on hazards materials and public health if it would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset or accident conditions involving their release into the environment;
- emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code 65962.5;
- expose construction workers to hazardous materials that would create health risks during construction;
- expose people or structures to a significant risk of loss, injury, or death from wildland fires; or
- result in a safety hazard for people residing or working in a project area that is located within 2 miles of a public airport or public use airport.

Although the new desalination treatment facility would be located approximately 1.25 miles from a public airport (Buchanan Field), the project is an appropriate industrial land use as zoned under the *Contra Costa County General Plan*, and building heights would conform to airport safety requirements (see Section 4.7, "Land Use"). Because the Desalination Alternative would not result in an airport-related safety hazard, this issue is not discussed further in this section.

Potential hazards associated with pipeline rupture are addressed in Section 4.4, "Earth Resources: Geology, Soils, and Seismicity."

4.13.2.3 No-Action Alternative

Under the No-Action Alternative, no new facilities would be constructed. Therefore, the No-Action Alternative would not result in any impacts on public health or safety related to hazards or hazardous materials. Further, the No-Action Alternative would not contribute to any cumulative hazardous materials impacts.

4.13.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.13-a (Alternative 1)

Potential Creation of a Public Health Hazard Through the Use of Hazardous Materials. *Construction and operation of the Proposed Action would involve the storage, use, and transport of hazardous materials. However, use of hazardous materials would be in compliance with local, State, and Federal regulations. Therefore, the risk of creating significant hazards to the public through routine transport, storage, use, disposal, and risk of upset would be very low. This impact would be* ***less than significant****.*

Construction of the proposed facilities would involve the storage, use, and transport of potentially hazardous materials (e.g., fuel, lubricants, and paint) that are commonly used during construction activities. In addition, industrial uses associated with operation and maintenance of the proposed pump station would require the use, storage, and routine transport of small quantities of hydraulic fluids, solvents, and other standard mechanical maintenance fluids on and off the proposed project site. There are no schools or other sensitive receptors within close proximity (1 mile) of the proposed project site; therefore, there would be no potential effects on sensitive receptors from the use of hazardous materials at the site. Transportation of hazardous materials on area roadways is regulated by the California Highway Patrol (CHP) and Caltrans, and use of these materials is regulated by the DTSC, as outlined in Title 22 of the CCR. Construction contractors would be required to use, store, and transport hazardous materials in compliance with local, State, and Federal regulations during project construction.

For facility operations, CCWD would use only minimal amounts of hazardous materials. CCWD would be required to obtain permits and comply with appropriate regulatory agency standards designed to avoid hazardous waste releases. CCWD would update its existing *Emergency Response Plan* and *Hazardous Materials Business Plan*, as necessary, to address risks associated with the operation of the new facilities. Because CCWD would implement and comply with existing hazardous material regulations, impacts related to the creation of significant hazards to the public through routine transport, use, disposal, and risk of upset would be minimized. Therefore, this impact would be less than significant.

IMPACT 4.13-b (Alternative 1)

Potential Exposure of Construction Workers and CCWD Personnel to Hazardous Materials. *No "recognized environmental conditions" (RECs) have been identified on the proposed project site. Because the site has been in agricultural use, excavation and other construction activities are not expected to result in the exposure of construction workers to hazardous materials such as asbestos or lead-based paint. Agricultural pesticide applications on Victoria Island and Byron Tract could pose a potential hazard to construction workers during the construction period and to CCWD maintenance personnel making routine visits to the intake and pump station facilities. Therefore, this impact would be* ***potentially significant****.*

No evidence of RECs or hazardous material contamination has been reported on or within 0.25 mile of the proposed project site. The records review conducted by EDR

(2005) did not find documentation of any known or potentially hazardous waste sites, landfills, hazardous waste generators, or disposal facilities in the search area. Project construction activities would not involve the demolition of any buildings, and thus would not expose workers to health risks from asbestos or lead-based paint. Therefore, potential exposure of construction workers to hazardous waste sites of construction-related materials would be a less-than-significant impact.

Under existing conditions, pesticides are applied periodically to crops on Victoria Island and Byron Tract as part of normal agricultural operations. Farming operations are expected to continue during the 30- to 36-month construction period with routine periodic aerial and land application of pesticides, and farming practices on both islands are expected to be the same as under existing conditions following the end of construction. A wide range of pesticides may be used on the local crops depending on seasonal crop and pest conditions. Pesticides typically used on asparagus, for example, include numerous insecticides, herbicides, fungicides, and nematicides. The potential effects of individual substances on humans depend on many factors, including pesticide type, amount of exposure, and individual responses and can range from mild headache to nausea and respiratory problems to temporary or prolonged neurological impairment.

Applications of some pesticides on Victoria Island and Byron Tract could pose a potential health and safety hazard to construction workers if they occur at or near the construction work zones when workers are present or if workers return to work sites before the substances have dispersed sufficiently. Similarly, CCWD maintenance staff could be exposed to harmful levels of pesticides during routine maintenance and monitoring visits to the new intake and pump facilities. Because of the potential for human health hazards posed by the proximity of the proposed facility sites to active agricultural areas where pesticides are sometimes used, this impact would be potentially significant.

IMPACT 4.13-c (Alternative 1)	**Potential Wildfire Hazard.** *The proposed project site is not located in a designated wildland fire area or a High Fire Hazard Severity Zone. Therefore, the Proposed Action would not expose people or structures to significant risk of injury involving wildland fires. This impact would be* ***less than significant****.*

Land at the proposed project site is under agricultural cultivation for asparagus, alfalfa, and wheat. These agricultural crops are not considered to be prime fuel sources for wildland fires. CDF identifies wildland fire areas and Very High Fire Hazard Severity Zones for all counties in California. The proposed project site is not located in or near these designated areas or zones. Implementation of the Proposed Action would not expose people or structures to significant risk of loss or injury involving wildland fires. Therefore, this impact would be less than significant.

Cumulative Impacts

Most construction projects, like the Proposed Action, would involve the storage, use, disposal, and transport of hazardous materials to varying degrees during construction and operation. Impacts related to these activities are considered less than significant under the Proposed Action because the storage, use, disposal, and transport of hazardous materials

are extensively regulated by various Federal, State, and local agencies. Those implementing other construction projects in the region (see Section 4.1.3, "Cumulative Impact Analysis" and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis") would be required to comply with the existing hazardous materials regulations. Therefore, it is assumed that significant cumulative hazards to the public related to the storage, use, disposal, or transport of hazardous materials would not occur. While the Proposed Action could result in some risk of hazards to the health of workers through their accidental exposure to agricultural pesticides, there are no other projects that would subject these workers to a similar type of risk. It is concluded that no significant cumulative risk of pesticide exposure exists. The Proposed Action, therefore, would not make a cumulatively considerable contribution to any significant cumulative impact related to hazardous materials.

Mitigation Measures

Mitigation Measure 4.13-b (Alternative 1): Coordinate with the Applicable Landowners and Land Managers to Ensure That Temporary Construction Workers and CCWD Personnel Are Not Exposed to Harmful Levels of Pesticides from Adjacent Agricultural Practices.
CCWD shall regularly coordinate with the owners and/or farm managers of the lands on Victoria Island and Byron Tract that are in the vicinity of the proposed project site to obtain information on the timing and type of planned pesticide applications. Construction work in and near areas where pesticides are applied shall be scheduled in coordination with the owners/farm managers as needed to prevent the exposure of construction workers to harmful levels of pesticides. Similarly, after construction of the proposed facilities is completed, CCWD shall routinely coordinate with the owners/farm managers to obtain information on pesticide use, including pesticide types, application locations, and timing of application, and shall curtail staff visits to the project facilities when they would result in potentially harmful exposure of personnel to pesticides.

Implementing this mitigation measure would reduce the potential for exposure to harmful levels of pesticides at the project site to a less-than-significant level.

4.13.2.5 Alternative 2, Indirect Pipeline Alternative

The direct, indirect, and cumulative impacts of Alternative 2 related to hazards and public safety would be the same as those described above for the Proposed Action. The same mitigation described for the Proposed Action would apply to Alternative 2 and would reduce the impact of potential exposure of workers to agricultural pesticides to a less-than-significant level.

4.13.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 related to hazards and public safety would be the same as those described above for the Proposed Action. The same mitigation described for the Proposed Action would apply to Alternative 3 and would reduce the impact of potential exposure of workers to agricultural pesticides to a less-than-significant level.

4.13.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.13-a (Alternative 4)

Potential Creation of a Public Health Hazard Through the Use of Hazardous Materials. *Construction and operation of the Desalination Alternative would involve the storage, use, and transport of potentially hazardous materials. In addition, the new desalination treatment facility would use small amounts of hazardous materials during operation. However, use of hazardous materials at the site would be in compliance with local, State, and Federal regulations. Therefore, the risk of creating significant hazards to the public through routine transport, storage, use, disposal, and risk of upset would be very low. This impact would be* ***less than significant****.*

Construction of the Desalination Alternative facilities would involve the storage, use, and transport of potentially hazardous materials (e.g., asphalt, fuel, lubricants, and paint) that are commonly used during construction activities. Operation and maintenance of the new intake and pump station at Mallard Slough would require the use, storage, and routine transport of small quantities (55 gallons or less) of hydraulic fluids, solvents, and other standard mechanical maintenance fluids on and off the site. Operation of the new desalination treatment facility would require the use, storage, and routine transport of chemicals such as sodium hypochlorite, ammonia, ferric sulfate, sulfuric acid, and sodium bi-sulfite. The desalination plant would be located at the existing Bollman WTP and the chemical use and storage would be consistent with the current activities at the Bollman WTP. There are no sensitive receptors, including schools, within 1 mile of the desalination plant site. Although several schools are located in close proximity to (within 0.25 mile of) the new untreated-water conveyance pipeline, neither the construction nor the operation of the pipeline would involve the handling of hazardous substances in large enough amounts to pose a health risk. Similarly, the construction and operation of the untreated-water conveyance pipeline would not involve the handling of hazardous substances in large enough amounts to pose a health risk; furthermore, this facility would not be near any sensitive receptors.

Transportation of hazardous materials on area roadways is regulated by the CHP and Caltrans, and use of these materials is regulated by the DTSC, as outlined in Title 22 of the CCR. The construction contractors would be required to use, store, and transport hazardous materials in compliance with local, State, and Federal regulations during project construction.

At the desalination plant, CCWD would be required to obtain permits and comply with appropriate regulatory agency standards designed to avoid hazardous waste releases. Pursuant to California Health and Safety Code, Division 20, Chapter 6.95, Article 1, CCWD would prepare a Business Plan for operation of its new desalination treatment facility that includes an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures. Because CCWD would implement and comply with existing hazardous material regulations and given the location of the desalination plant at an existing WTP, impacts related to creation of significant hazards to the public (including sensitive receptors such as school

children) through routine transport, use, disposal, and risk of upset would not occur with project development. Therefore, this impact would be less than significant.

IMPACT 4.13-b (Alternative 4)

Potential Exposure of Construction Workers to Hazardous Materials and Conditions. *New facilities associated with the Desalination Alternative would be located within existing rights-of-way for roadways and the Contra Costa Canal, on vacant land adjacent to existing CCWD facilities, or in previously undeveloped open space areas. These locations would not be expected to contain sources of hazardous materials. However, workers could encounter hazardous materials during construction activities in areas that have not been investigated for the presence of such materials. Construction workers could also be exposed to hazards associated with inadvertent damage of other utility lines. Therefore, this impact would be* ***potentially significant****.*

The new untreated-water conveyance pipeline would be located almost entirely within existing roadway rights-of-way along the alignment of the existing pipeline connecting the Mallard Slough pumping plant to the Contra Costa Canal, along the alignment of the Contra Costa Canal, and within existing roadway rights-of-way in Clyde. A hazardous materials study, comprising a Phase I data review and Phase II field investigation (and laboratory testing), performed as part of the Multi-Purpose Pipeline Project (CCWD 2000) along the Contra Costa Canal alignment found that the detected chemical concentrations were below conservative screening concentrations at most of the test locations, indicating that there is no significant concern for risk to human health. However, at two locations, several metals exceeded the EPA's Preliminary Remediation Goals (PRGs) for residential or industrial soil (CCWD 2000). Based upon the available information, the potential for encountering hazardous material in the area of the Contra Costa Canal is considered low; nevertheless, it is possible that contaminated soil and groundwater may exist between sampling locations (CCWD 2000).

The new desalination treatment facility would be located on vacant land adjacent to and north of the Bollman WTP. Because this land is vacant and has not been used previously for industrial purposes, it is not anticipated that construction of this facility would encounter sources of hazardous materials. The new Mallard Slough intake and pumping plant would be constructed on CCWD land that is partially developed, at the site of the existing Mallard Slough facilities.

Project construction activities would not involve the demolition of any buildings, and thus would not expose workers to health risks from asbestos or lead-based paint. However, some of the untreated-water conveyance pipeline and the concentrate disposal pipeline would be routed through land that has not been previously developed, including land that is part of the Concord Naval Weapons Station. Due to the absence of confirmatory records searches for all of the project sites and because the available soil test data are of limited scope, it is assumed that hazardous materials may be present in these areas.

In addition, portions of the untreated-water conveyance pipeline would pass through areas where other pipelines and utilities are present, and during construction, workers

could be exposed to hazards associated with inadvertent damage of other lines if they are under high pressure or contain potentially hazardous materials (e.g., natural gas).

Because the potential exists for exposure of construction workers to currently unknown hazardous materials and to hazards associated with potential damage of existing utility lines during construction of the Desalination Alternative facilities, this impact would be potentially significant.

IMPACT 4.13-c (Alternative 4)	**Potential Wildfire Hazard.** *Facilities associated with the Desalination Alternative would not be located in a designated wildland fire area or a High Fire Hazard Severity Zone. Therefore, the project would not expose people or structures to significant risk of injury involving wildland fires. This impact would be* ***less than significant****.*

The Desalination Alternative facilities would not be located within a designated wildland fire area or a High Fire Hazard Severity Zone. The new untreated-water conveyance pipeline would be located almost entirely within existing rights-of-way along roadways and along the Contra Costa Canal alignment. Much of the pipeline route would be located within urban areas, where the risk of wildland fires is extremely low. Approximately 1.25 miles of pipeline construction would occur adjacent to a Moderate Fire Hazard Severity Zone according to CDF (2001). However, construction activities associated with the Desalination Alternative would not constitute a severe fire hazard, and emergency service providers in the vicinity of project construction activities have adequate capacity to serve the project should the need arise. The new desalination treatment facility and new concentrate disposal pipeline would be located within vacant, open land adjacent to a marsh, where the risk of wildland fires is low. Because implementation of the Desalination Alternative would not expose people or structures to significant risk of loss, injury, or death involving wildland fires, this impact would be less than significant.

Cumulative Impacts

Most construction projects, like the Desalination Alternative, would involve the storage, use, disposal, and transport of hazardous materials to varying degrees during construction and operation. Impacts related to these activities are considered less than significant under the Desalination Alternative because the storage, use, disposal, and transport of hazardous materials are extensively regulated by various Federal, State, and local agencies. It is assumed that those implementing other construction projects in the region (see Section 4.1.3, “Cumulative Impact Analysis” and Appendix F-1, “Local Development Projects Considered in Cumulative Impact Analysis”) would implement and comply with these existing hazardous materials regulations. Therefore, significant cumulative hazards to the public are not expected to occur.

Although construction of facilities for the Desalination Alternative has the potential to expose construction workers to currently unknown hazards in areas of construction ground disturbance, this impact would be site-specific and limited to the work force for the Desalination Alternative; it would not contribute to any cumulative impact.

For these reasons, the Desalination Alternative would not make a cumulatively considerable contribution to any significant cumulative impact related to hazardous materials.

Mitigation Measures

Mitigation Measure 4.13-b(1) (Alternative 4): Complete a Hazardous Materials Records Search and a Phase I Environmental Site Assessment for the Project Footprint, and Implement Appropriate Measures to Prevent the Exposure of Construction Workers to On-Site Hazardous Materials. Before the completion of final project design, CCWD shall have a hazardous materials records search completed for the project footprint and identify any areas of potential concern with regard to the potential presence of hazardous materials. In addition, CCWD shall ensure that a Phase I Environmental Site Assessment is performed by a qualified hazardous materials specialist for any areas that would be disturbed during construction that have not been previously investigated for the presence of hazardous materials or that were previously determined not to contain hazardous materials but that could have been contaminated subsequent to that determination. A written report on the findings of the assessment shall be provided to CCWD. If any potential hazards are identified in the report in the footprint of the project facilities, CCWD shall implement measures in accordance with Federal and State regulations, such as site cleanup or realignment of project facilities, to ensure that workers are not exposed to potential hazards.

Implementation of this mitigation would reduce the potential impact to a less-than-significant level.

Mitigation Measure 4.13-b(2) (Alternative 4): Reduce the Potential for Damage to Existing Utilities. This measure is identical to Mitigation Measure 4.12-a (Alternative 4) in Section 4.12, "Utilities and Service Systems." Implementation of this measure would reduce the potential for damage to utility lines and resulting hazards to construction workers to a less-than-significant level.

4.14 Visual Resources

This section focuses on aesthetic resources that may be affected by project elements. Effects of project construction on recreational uses are addressed in Section 4.15, "Recreation." Temporary effects of project construction on the noise environment are evaluated in Section 4.11, "Noise."

4.14.1 Affected Environment

4.14.1.1 Regulatory Setting

State

California Scenic Highway Program
In 1963, the California legislature created the Scenic Highway Program to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to the highways. The State regulations and guidelines governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. A highway may be designated as "scenic" depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the travelers' enjoyment of the view.

State Route (SR) 4 is the only State highway from which the proposed project site (i.e., Victoria Island and Byron Tract) would be visible. SR 4 is not an officially designated State scenic highway in this area, although one segment of SR 4 within Contra Costa County, between the intersection with SR 160 near Antioch and SR 84 near Brentwood, is eligible for scenic highway designation (California Department of Transportation 2005). Because this segment is 6 or more miles from the proposed project site, it would not be affected by the construction of new facilities and is not considered further in this evaluation. The intersection of SR 242 and SR 4 is in the vicinity of the Bollman Water Treatment Plant (WTP), the site for the new desalination treatment facility under the Desalination Alternative (see Exhibit 4.7-2 in Section 4.7, "Land Use"). Because of the highway's distance from the Desalination Alternative project sites, however, it would not be affected by construction of new facilities and is similarly not considered further in this evaluation.

Local

Contra Costa County

Scenic Routes and Corridors
Chapter 5, Transportation and Circulation Element, of the *Contra Costa County General Plan 2005–2020* (Contra Costa County 2005) identifies county-designated scenic routes

and corridors within Contra Costa County. A scenic route is defined as "a road, street, or freeway which traverses a scenic corridor of relatively high visual or cultural value." A scenic corridor is described as "usually much wider than the road right-of-way and extends to the contiguous areas beyond it," consisting of much of the adjacent area that can be seen from the road. According to the general plan, "controls should be applied to retain and enhance scenic qualities, restrict unsightly use of land, control heights of structures, and provide site design and architectural guidance along the entire scenic corridor."

SR 4 from I-80 near Hercules to Bay Point and from Antioch to the San Joaquin County line (including the segment that crosses Byron Tract and Victoria Island) is designated by Contra Costa County as a scenic highway. SR 242 is also designated as a scenic highway from near Pleasant Hill to its intersection with SR 4 in Concord. The intersection of SR 242 and SR 4 is in the vicinity of the Bollman WTP.

The Scenic Routes goal in the general plan is "to identify, preserve and enhance scenic routes in the county." The following related policies may be relevant to this visual resources analysis:

- Policy 5-34. Scenic corridors shall be maintained with the intent of protecting attractive natural qualities adjacent to various roads throughout the county.
- Policy 5-36. Scenic views observable from scenic routes shall be conserved, enhanced, and protected to the extent possible.

Scenic Resources
Chapter 9, Open Space Element, of the *Contra Costa County General Plan 2005–2020* (Contra Costa County 2005) identifies scenic resources within Contra Costa County. Specifically, the San Francisco Bay/Delta estuary system is identified as one of the two main scenic resources in Contra Costa County. The Scenic Resources map included in the General Plan identifies resources that should be treated as aesthetic opportunities, including areas that have been given a Scenic Waterways designation, the intent of which is "to draw attention to [their] scenic character for consideration when reviewing projects."

The shoreline adjacent to Mallard Slough is a designated Scenic Waterway, as is Old River.

The following general plan goals and policies for scenic resources may be pertinent to this evaluation:

- Goal 9-D. To preserve and protect areas of identified high scenic value, where practical, and in accordance with the Land Use Element map.
- Goal 9-F. To preserve the scenic qualities of the San Francisco Bay/Delta estuary system and the Sacramento-San Joaquin River/Delta shoreline.

San Joaquin County
The *San Joaquin County General Plan 2010* (San Joaquin County 1992) includes in its Resources Element an Open Space section with the following objective: "to preserve open space land for the continuation of commercial agricultural and productive uses, the enjoyment of scenic beauty and recreation, the protection and use of natural resources, and for protection from natural hazards."

The following are the pertinent parts of related policies that may be relevant to this analysis:

- Policy 10. Views of waterways, hilltops, and oak groves from public land and public roadways shall be protected.
- Policy 11. Outstanding scenic vistas shall be preserved and public access provided to them whenever possible.
- Policy 12. The county should recognize the roads shown in Figure VI-2 [in the general plan] as scenic routes and as valuable in enhancing the recreational experience for county residents and non-residents.

Scenic Routes, as defined by the general plan, in the vicinity of the proposed project site include SR 4 as it crosses Victoria Island.

Cities of Concord and Pittsburg
There are no designated scenic roadways within the City of Concord or within the City of Pittsburg or its sphere of influence.

4.14.1.2 Environmental Setting

Victoria Island/Byron Tract
Victoria Island and Byron Tract are in the agricultural region of the northwestern San Joaquin Valley and are bisected by SR 4, which provides access to the proposed project site from the east and west. Brentwood is the nearest city to the west and is located approximately 6 miles from the proposed project site in Contra Costa County. The community of Discovery Bay is about 1 mile west of Byron Tract, north of SR 4. Stockton is the nearest city to the east and is located approximately 11 miles from the proposed project site in San Joaquin County.

The regional landscape character is defined by expansive, flat agricultural lands, which, in long-range views from SR 4, appear to recede into the northern, eastern, and southern horizons. The eastern slope of Mount Diablo and the foothills that make up the Morgan Territory Regional Park are visible in medium-range views to the west and provide a dominant visual backdrop to the project area. A viewer looking west would have the accurate perception of being near the western edge of a large valley—in this case, California's Central Valley.

The landscape in the vicinity of the proposed project site is similarly dominated by agricultural uses completely contained within flood control features. The area has undergone extensive land reclamation and agricultural development activity to allow for

the production of commercial agricultural crops (mainly asparagus, alfalfa, and wheat). In addition to cultivated fields, local features in views of Victoria Island include Victoria Canal and the adjacent levees; irrigation canals and ditches alongside dirt roads, which serve as access to the fields and, occasionally, as separation between crops; agricultural support facilities (carport and a small group of structures providing farm employee housing); and irrigation pumps, siphons, and pipelines.

Victoria Island and Byron Tract are separated by Old River. CCWD's existing Old River intake and pump station facilities are located on the west bank of Old River on Byron Tract, which is similarly dominated by agricultural uses. Southwest of CCWD's Old River facility is an agricultural pump station, from which pipelines extend over the Old River east levee. Between SR 4 and the CCWD Old River facility is a private business with a large equipment yard. Transmission lines supported by wooden poles extend across both Victoria Island and Byron Tract. Metal-frame transmission towers also extend across Victoria Island.

Exhibits 4.14-1 through 4.14-4 present representative photographs of Victoria Island and Byron Tract.

Desalination Alternative Project Sites

The Bollman WTP site is north of the Concord city limits but within the city's sphere of influence, and is in a developed commercial/industrial area. SR 4 passes the site to the south. The Port Chicago Highway, a Contra Costa County scenic route, passes to the west and north of the site. The Bollman WTP site includes an existing treatment plant and ancillary facilities; paved, landscaped, and undeveloped areas; and Mallard Reservoir, a 3,000-acre-foot untreated-water storage reservoir, to the north of the plant, beyond which undeveloped marshland extends to the north to Suisun Bay. Light industrial and business park uses are to the east and south of the Bollman WTP facility. Views of much of the Bollman WTP site from adjacent roadways and properties to the south and east are obstructed by the landscaping on the southern edge of the WTP site and in the adjacent business park. To the west of the site is a "Tank Farm" associated with the nearby oil refineries. Large, squat, cylindrical tanks, colored in a variety of pastels, dot the low-lying hillside, dominating many short- and medium-range views of the area from Suisun Bay. Views from the vicinity of the plant site to the northwest are dominated by the medium-range presence of an oil refinery and its industrial, mechanized landscape.

The Mallard Slough intake and pump station site is north of the Bay Point area within a flat expanse of undeveloped marshland. The general vicinity of the area is characterized by open space with low-growing vegetation and a few trees, railroad lines, and clearings with makeshift campgrounds and trash scatters. The pump station is visible in medium-distance views from the backs of the nearest residences in Bay Point. Beyond the facility, one of the largest power plants in Northern California is also visible to the west, set amid undeveloped land. Hillsides in Solano County are visible in long-range views to the north and northeast of the site, beyond Suisun Bay, which is not visible.

Exhibits 4.14-5 and 4.14-6 present representative photographs of the Desalination Alternative project sites, specifically Bollman WTP and Mallard Slough intake and pump station.

View of Victoria Canal (potential intake locations) from the levee road on Victoria Island, facing so uthwest (April 18, 2005)

View of agricultural fields and private access roads at Victoria Island, facing northwest (April 18, 2005)

G 02110048.01 0014

Source: EDAW 2005

Representative Photographs from Victoria Island

EXHIBIT 4.14-1

View of Victoria Island agricultural fields, structures, and power lines from Byron Tract, facing east (April 18, 2005)

View of Victoria Island agricultural fields, structures, and power lines from a private access road approaching SR 4, facing east (April 18, 2005)

G 04110048.01 015

Source: EDAW 2005

Representative Photographs from Victoria Island/Byron Tract

EXHIBIT 4.14-2

View of Old River Intake and Pump Station from the levee road on Victoria Island, facing northwest (April 18, 2005)

View of Old River Bridge from the levee road on Victoria Island, facing northwest (April 18, 2005)

G 04110048.01 016

Source: EDAW 2005

Representative Photographs from Victoria Island/Byron Tract

EXHIBIT 4.14-3

View of Byron Tract and Discovery Bay (visible in distance) from the levee road, facing northwest (April 18, 2005)

View of Byron Tract agricultural fields and private access roads, facing west (April 18, 2005)

G 04110048.01 017

Source: EDAW 2005

Representative Photographs from Byron Tract

EXHIBIT 4.14-4

View from proposed site for new desalination treatment facility at Bollman WTP (shown at right), facing north towards Mallard Reservoir (April 18, 2005)

View of surrounding industrial land uses visible from Bollman WTP, facing northwest (April 18, 2005)

G 04110048.01 018

Source: EDAW 2005

Representative Photographs from Bollman WTP

EXHIBIT 4.14-5

View of Mallard Slough Intake and Pump Station, facing northeast (April 18, 2005)

View of surrounding land uses (residential an industrial) visible from Mallard Slough Intake and Pump Station, facing south (April 18, 2005)

G 04110048.01 019

Source: EDAW 2005

Representative Photographs from Mallard Slough Intake and Pump Station

EXHIBIT 4.14-6

4.14.2 Environmental Consequences

4.14.2.1 Methods and Assumptions

The aesthetic quality of an area is determined through the variety and contrasts of the area's visual features, the character of those features, and the scope and scale of the scene. The aesthetic quality of an area depends on the relationships between its features and their importance in the overall view. Evaluating scenic resources requires a method that objectively characterizes visual features, assesses their quality in relation to the visual character of the surrounding area, and identifies their importance to the individuals viewing them. This process is derived from established Federal procedures for visual assessment and is commonly used for a variety of project types.

Both natural and created features in a landscape contribute to its perceived visual quality. Landscape characteristics influencing visual quality include geologic, hydrologic, botanical, wildlife, recreation, and urban features. Several sets of criteria have been developed for defining and evaluating visual quality. A commonly used set of criteria includes the concepts of vividness, intactness, and unity. None of these is itself equivalent to visual quality; all three must be high to indicate high quality. These terms are defined as follows (Federal Highway Administration 1983):

- "Vividness" is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- "Intactness" is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements.
- "Unity" is the visual coherence and compositional harmony of the landscape considered as a whole.

The analysis of this study uses a qualitative descriptive method for characterizing and evaluating the visual resources of the areas that could be affected by the project. The quality of views of areas that could be affected by the Proposed Action and alternatives is evaluated based on the relative degree of vividness, intactness, and unity apparent in views and also on viewer sensitivity. Viewer sensitivity is a function of several factors, including the following:

- visibility of the landscape,
- proximity of viewers to the visual resources,
- frequency and duration of views,
- number of viewers,
- types of individuals and groups of viewers, and
- viewers' expectations.

The sensitivity of a view of the landscape is also determined by the extent of the public's concern for a particular view. Areas of high visual sensitivity are highly visible to the general public. Scenic highways, tourist routes, and recreation areas are considered more

visually sensitive than more urbanized locations. A determination finding that a potential visual impact has significance would be based on a change in visual character as determined by the obstruction of a public view, creation of an aesthetically offensive public view, or adverse changes to objects having aesthetic significance. A view's distance from landscape elements plays an important role in the determination of an area's visual quality. Landscape elements are considered higher or lower in visual importance based on their position relative to the viewer. Generally, the closer a resource is to the viewer, the more dominant, and therefore visually important, it is to the viewer.

4.14.2.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. An alternative was determined to result in a significant effect on visual resources if it would:

- have a substantial, demonstrable negative aesthetic effect on a scenic vista;
- substantially damage scenic resources including, but not limited to, scenic waterways, trees, rock outcroppings, and historic buildings within a State scenic highway;
- substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

4.14.2.3 No-Action Alternative

Under the No-Action Alternative, no new facilities would be constructed, and existing facilities would not be altered, expanded, or demolished. Implementation of the No-Action Alternative would not affect scenic vistas, scenic resources, or the existing visual character of the surrounding area, and would not create any additional source of light or glare. The No-Action Alternative would have no direct or indirect effect on visual resources and would not contribute to any cumulative impact.

4.14.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.14-a (Alternative 1)

Temporary Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character. *Construction activities associated with the Proposed Action could temporarily reduce the aesthetic qualities of views by introducing earthmoving equipment and other construction equipment, materials, work crews, and barges into the viewshed of motorists on SR 4, workers in nearby farming areas, recreationists on adjacent waterways, and residents of the area. However, most construction activities would be distant and/or shielded from most viewers. For these reasons, and because of the temporary nature of this effect, this impact would be* ***less than significant****.*

The major construction components of the Proposed Action would be levee modification at the intake and pump station site, installation of the intake and fish screen, construction of the pump station and associated facilities at the intake site, installation of the pipeline across Victoria Island and under Old River, and connection to the Old River conveyance system. Typical heavy construction equipment would be used throughout the construction area, and a construction labor force averaging about 75 to 100 (with a peak of 125) is expected to be present during an approximately 36-month construction period.

The presence and movement of heavy construction equipment and potential construction-related generation of dust could temporarily degrade the existing visual character and/or quality of the area. Most viewers of the construction areas would be travelers along SR 4, workers in nearby farming areas, occupants of a few scattered residences across Old River and Victoria Canal from Victoria Island, and recreationists on Old River and Victoria Canal. Of these groups, recreationists and residents are considered the most sensitive to aesthetic qualities. However, of these viewer groups, residents would be the farthest (at a distance of 1 mile or more) from Victoria Island, where most of the construction activity would take place. Recreationists' views of land-side construction would largely be blocked by the levees. Views of the construction areas from SR 4 would be brief and long distance, with normal agricultural activities in much of the foreground. Agricultural workers would have longer term views of construction areas but are not considered a sensitive viewer group.

The installation of the conveyance pipeline across Old River and installation of the fish screen at the proposed intake site on Victoria Canal would likely entail the use of barges that may be visible at times to any of these viewer groups. Barges are a common sight in Delta waterways and are not expected to have a substantial negative effect on the vividness, intactness, or unity of views.

For these reasons, and because of the temporary nature of this effect, this impact would be less than significant.

IMPACT 4.14-b (Alternative 1)

Long-Term Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character. *The proposed pump station and associated aboveground facilities would be the primary project facilities visible following construction. These facilities would be very distant from most viewers and would be similar in appearance to other Delta water intake and pumping facilities. Their presence would not substantially affect the vividness, intactness, or unity of views of the area for any viewer groups. This impact would therefore be* ***less than significant****.*

Of the new structures associated with the proposed intake and pump station at Victoria Canal, the motor control center and electrical substation, both located on a reconfigured levee, and new electrical lines would be the primary facilities visible after construction is completed. The facilities would be within the viewshed of travelers along SR 4, workers in nearby farming areas, occupants of distant residences, and recreationists on Old River and Victoria Canal. These views are of moderate to low vividness and have a high overall degree of intactness and unity, consisting mainly of agricultural, flood control, and water diversion features.

Of the major viewer groups, recreationists and residents are considered the most sensitive to aesthetic qualities. The facilities would be built up on the new setback levee, and thus would be somewhat visible above the levee when viewed from the nearest residences, about 1 mile from the new pump station to the southwest, and from the farm worker housing, approximately 1.5 miles to the north and northwest on Victoria Island. Recreationists' views of these facilities from Victoria Canal and Old River would be brief; the near-distance levee of Victoria Island would block most views of recreationists on Old River, with the exception of the new intake structure, which would be constructed on the levee face and would therefore be visible to recreationists on Old River. The structures would also be visible in long-distance views from SR 4. However, they would be located approximately 1.5 miles from SR 4, on which traffic travels at relatively high speeds. Structures viewed from this distance would appear as small features in the viewshed and would also be visible for only short durations to travelers on SR 4.

The project facilities would be constructed of materials and painted with color tones similar to those of the Old River Pump Station and other Delta facilities. The intake structure would be approximately 100 feet to 200 feet long, depending on the depth of the screen, which is anticipated to be 10 feet to 15 feet. The pump station and associated mechanical piping would occupy a footprint area approximately 140 feet long by 60 feet wide. Normal water surface elevations at the intake would vary with tide; however, the intake pumps would be designed to operate at high and low water levels. The intake/ pump station facilities would also include a smaller motor control center/maintenance building and an electrical substation, which would be an open area measuring approximately 120 feet by 80 feet surrounded by chain-link fencing.

The new structures that would be visible would be typical of existing facilities throughout the Delta that are a recognized and generally accepted part of the landscape. Within the context of the surrounding setting—an entirely developed agricultural environment containing elevated levees, water pumping facilities, and metal transmission lines—the proposed facilities would not have a substantial, demonstrable negative effect on the overall vividness or intactness of views or the unity of elements within those views. The Proposed Action would not substantially damage scenic vistas or scenic resources or degrade the existing visual character of the area. This impact would be less than significant.

IMPACT 4.14-c (Alternative 1)

Changes in Light or Glare. *Implementation of the Proposed Action would not create a new source of substantial light or glare that would affect day or nighttime views in the area. This impact would be* ***less than significant****.*

Equipment staging areas may be temporarily lit for security reasons during the construction period, and portions of the construction areas may need to be lit if construction work needs to be conducted at night. However, views of the construction areas from SR 4 and nearby residences would be largely shielded due to the proposed project site's distance from these sensitive receptors. For this reason, and because of the temporary nature of this effect, this impact would be less than significant.

The proposed new facilities would be constructed of materials that would not create a new source of substantial light or glare that would affect day or nighttime views in the area. New lighting would be installed as part of the new facilities for security and safety; however, directional shielding and other such measures would be implemented to minimize the encroachment of project-related lighting to nearby land uses. For this reason, and because of the proposed project site's distance from sensitive receptors, this impact would be less than significant.

Cumulative Impacts

The primary Delta activities that could contribute to cumulative impacts on visual resources in the alternative intake project area are related to CALFED's South Delta Improvements Program (SDIP) (see Section 4.1.3, "Cumulative Impact Analysis" and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis"). This program anticipates minor dredging in Middle River and several other channels, as well as in-channel construction of permanent operable barriers on Middle River (just south of Victoria Island Canal), Grantline Canal (southwest of Victoria Island), and Old River (south of the Clifton Court Forebay). Channel dredging proposed for Middle River and barrier construction operations on Middle River would result in the temporary presence of heavy equipment and barges that would be visible from waterways and some land-based vantage points. Depending on the specific timing of construction, impacts associated with SDIP and alternative intake construction activities could overlap in time. However, even so, the combined effect on visual resources would be less than significant because the activities would be distant from one another and temporary. There are no known projects that would have permanent features that would significantly degrade the character or quality of views in the vicinity of the proposed project site or create new sources of light or glare. Because of this and because the effects of the proposed alternative intake facilities on the character and quality of views would be minor, the Proposed Action would not contribute considerably to any significant cumulative impact.

Mitigation Measures

No mitigation is required.

4.14.2.5 Alternative 2, Indirect Pipeline Alternative

The direct, indirect, and cumulative impacts of Alternative 2 would be essentially the same as those described for the Proposed Action, although the pipeline alignment and, therefore, the specific construction-period areas of disturbance, would be somewhat different. The impacts of Alternative 2 on visual resources would be less than significant.

4.14.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 would be identical to those described for the Proposed Action. The impacts of Alternative 3 on visual resources would be less than significant.

4.14.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.14-a (Alternative 4)

Temporary Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character. *Construction activities associated with the Desalination Alternative would reduce the quality of views by introducing construction equipment, materials, and work crews into the views from nearby residences and the viewsheds of recreationists and motorists. However, the construction areas would be distant or shielded from most viewers, and construction activity would be temporary. For these reasons, this impact would be* ***less than significant****.*

The major construction components of the Desalination Alternative would be the new intake and pump station at Mallard Slough, untreated-water conveyance pipeline, desalination treatment facility at Bollman WTP, and concentrate disposal pipeline to Suisun Bay. Contractor construction equipment could include construction trailers, excavators, front-end loaders, a grader, and other heavy vehicles and equipment. The presence and movement of heavy construction equipment and construction-related generation of dust would have the potential to temporarily degrade the existing visual character and/or quality of portions of the Desalination Alternative project sites.

Much of the construction activity would take place in areas that are not highly visible to the nearest sensitive receptors (i.e., Mallard Slough, Bollman WTP, and most of the concentrate disposal pipeline corridor). A portion of the new concentrate disposal pipeline would extend into Suisun Bay, a designated scenic waterway that is visible to recreationists, and portions of the new untreated-water conveyance pipeline would be located in close proximity to residences in Bay Point. Although the sensitivity of recreationists and residents to adverse changes in views is high, the impact on these viewers is considered less than significant because of its temporary nature. Where construction activity would be adjacent to residences in the Bay Point community, it would be relatively short term in any location.

Because much of the construction activity would not be visible to many sensitive viewers and because of its temporary nature, this impact would be less than significant.

IMPACT 4.14-b (Alternative 4)

Long-Term Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character. *Implementation of the Desalination Alternative would not adversely affect a scenic vista, damage scenic resources, or substantially degrade the existing visual character or quality of the Desalination Alternative project sites and their surroundings. While the new facilities associated with this alternative would change the appearance of the Mallard Slough and Bollman WTP project sites, the new facilities that would be constructed aboveground would generally be consistent with existing land uses and would be constructed to blend in with existing facilities, and would not be important features in the views of sensitive viewer groups. This impact would therefore be* ***less than significant****.*

Implementation of the Desalination Alternative would involve the construction of a new intake and pump station at Mallard Slough, untreated-water conveyance pipeline,

desalination treatment facility at Bollman WTP, and concentrate disposal pipeline to Suisun Bay.

The new intake and pump station at Mallard Slough would be constructed directly adjacent to the existing Mallard Slough intake and pump station. The new facilities would occupy a similarly sized footprint and would be constructed of materials similar to those of the existing facilities. The existing Mallard Slough Pump Station would roughly double in size. No designated scenic roadways are nearby. Views of this area would be from residences at the edge of development in the Bay Point area.

The views of the existing area from Bay Point lack vividness, intactness, and unity. The area around the facility site is a broad expanse of open marshland. Industrial facilities are visible in the distance, and in the foreground and middle ground of the views from Bay Point are railroad tracks; fences; scattered trees and shrubs; makeshift campsites; and scattered, unauthorized trash heaps. Because of the presence of intervening features and the distance of the pump station site from the nearest residences, the new facilities would not be highly visible from Bay Point residences. Because of the low visibility of the new facility, the low quality of existing views of the area, and the fact that the new facility would blend with the character of the existing CCWD Mallard Slough intake and pump station, impacts of the new intake and pump station facility on views from Bay Point would not be significant.

The new untreated-water conveyance pipeline would extend through several different areas, including a residential neighborhood south of Mallard Slough, a portion of the Contra Costa Canal corridor, and a residential area east of Bollman WTP. The new pipeline would be installed underground and would therefore not be visible once construction is complete. Therefore, there would be no long-term effects of pipeline installation on visual resources.

The new desalination treatment facility at Bollman WTP would be constructed within the boundary of an existing water treatment plant site and would be mostly obscured from the inland property edge by existing buildings and landscaping. There would be no particularly sensitive viewer groups on the land side of the facility. Surrounding land uses are business and industrial, and the facility would not be visible from a scenic highway. The new facility would consist of an approximately 87,500-square-foot-structure within the existing Bollman WTP facility. The character and visual qualities of the new facility would be consistent with those of the surrounding business-industrial area and existing uses of the site. The new facility may be visible to boaters in long-distance views from Suisun Bay. However, these views are currently dominated by industrial facilities and development, with which the new facility would be consistent in character and style. Therefore, the presence of this facility would not change the character of the area or the quality of visual resources, and its impacts on visual resources would be less than significant.

The new concentrate disposal pipeline would be routed from Bollman WTP north to Suisun Bay. Similar to the new untreated-water conveyance pipeline, this new disposal pipeline would be installed underground and would therefore not be visible once

construction is complete. The discharge would consist of an outfall diffuser located approximately 2,000 to 2,500 feet from the shoreline. Although Suisun Bay is designated as a scenic waterway, this new pipeline would not be visible from the water surface, as it would be installed along Suisun Bay's floor and would terminate at a water depth of 50–75 feet. Therefore, the concentrate disposal pipeline would have no permanent impact on visual resources.

For the reasons stated above, this impact would be less than significant.

IMPACT 4.14-c (Alternative 4)

Changes in Light or Glare. *Implementation of the Desalination Alternative would not create a new source of substantial light or glare that would affect day or nighttime views. This impact would be* ***less than significant****.*

Construction of the new intake and pump station at Mallard Slough and the new desalination treatment facility at Bollman WTP would likely include some additional lighting. However, the additional lighting would not add substantially to the existing facility lighting. At both locations, existing foliage and landscaping in these areas would serve to screen the lighting from neighboring properties, which consist of marshland and distant residences at the Mallard Slough site and industrial and business park uses at the Bollman WTP site. There would be no new sources of light or glare associated with installation of the new untreated-water conveyance pipeline and concentrate disposal pipeline to Suisun Bay.

Equipment staging areas may be temporarily lit for security reasons during the construction period for the Desalination Alternative, and portions of the construction areas may need to be lit if construction work needs to be conducted at night. However, construction-related lighting would be temporary in any location.

Because construction lighting would be short term, and because permanent lighting of the new intake/pump station and desalination plant would be distant from the nearest viewers and shielded from most views, this impact would be less than significant.

Cumulative Impacts

There are no other planned projects within the viewshed of the Desalination Alternative facilities (see Section 4.1.3, "Cumulative Impact Analysis" and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis"), and no cumulative impacts on visual resources are anticipated. For this reason and because the Desalination Alternative facilities would not significantly affect views or visual resources, it is reasonable to conclude that this alternative would not contribute to a significant cumulative effect on visual resources.

Mitigation Measures

No mitigation is required.

4.15 Recreation

This section describes the existing recreational setting of the proposed project site and Desalination Alternative project sites, and analyzes the potential impacts of the Proposed Action and alternatives on recreational resources. Effects of project construction on aesthetic resources are addressed in Section 4.14, "Visual Resources."

4.15.1 Affected Environment

4.15.1.1 Regulatory Setting

There are no Federal or State recreation laws or policies that are relevant to the Proposed Action or alternatives. As described in Section 4.7, "Land Use," the Delta Protection Commission has developed a *Land Use and Resource Management Plan for the Primary Zone of the Delta* (Delta Plan) that addresses recreation, in addition to land uses and wildlife habitat, in the Primary Zone of the Delta, which includes Victoria Island. With regard to recreation, the plan guides local governments in promoting the development of facilities that will maintain public access to Delta recreational resources. In its comment letter during the scoping period for this EIR/EIS, the commission indicated that the proposed alternative intake and associated facilities would be consistent with the planned uses of the Delta Primary Zone (see Appendix A-1, "Public Scoping Report").

The *San Joaquin County General Plan* (1992) and *Contra Costa County General Plan* (2005) also contain general policies that broadly promote the protection of water-related resources, natural and wildlife resources, waterway navigability, and recreational resources in the Delta.

4.15.1.2 Environmental Setting

The following sections describe the existing recreational opportunities and facilities near the proposed project site, as well as the Desalination Alternative project sites.

Victoria Island/Byron Tract

Located in the southern part of the Delta, both Victoria Canal and Old River are popular boating, water-skiing, and fishing locations. Victoria Canal has 12 miles of navigable waterways and Old River has 42 miles. Old River (as well as Middle River, which can be accessed via Victoria Canal from areas near Clifton Court Forebay and farther south) is considered a boating route (California Department of Boating and Waterways 2002).

Recreational boating is the primary use of Victoria Canal and the portion of Old River at the proposed project site, but there are no boating facilities at Victoria Canal or Old River. The closest boating facilities are located at nearby marinas, including Lazy M Marina near Clifton Court Forebay, Discovery Bay Yacht Club off of Old River, and Union Point Resort on Middle River near Victoria Canal. Table 4.15-1 lists the facilities at each of these marinas. Boaters that use these marinas likely use Old River and Victoria

Canal as recreational boating sites or, particularly for larger cruising boats, as thoroughfares to facilities in northern parts of the Delta and Middle River.

Table 4.15-1
Marinas near Victoria Island and Byron Tract

Marina Name	Location	Number of Slips	Amenities
Discovery Bay Yacht Harbor	Discovery Bay off Old River	266	Restrooms, electricity, snack bar, mail/message, water, dry storage, pumpout, dock boxes, phones, launch ramp, ice, fuel dock, restaurant, showers, groceries, security, guest facilities, parking, canvas shop, boat supplies, water ski, boat brokerage
Union Point Resort	Middle River	None	Restrooms, some electricity, phones, ice, fuel dock, self-serve restaurant, day use docks only
Lazy M Marina	Italian Slough	Unknown	Launch ramp, gas, restrooms, outdoor storage, wet berths, snack bar, ice

Source: The Log 2005; Mygrant, pers. comm., 2005

Additionally, Old River and Victoria Canal are likely used as recreational boating areas and/or thoroughfares by the residential communities that are located approximately 1 mile away from the proposed intake site on an island south of Victoria Canal.

Water-skiing is also popular at both Victoria Canal and Old River, with heaviest use during summer. The south Delta has many sheltered and quiet waters due to the areas' position on the leeward side of the Diablo Range. This characteristic provides for excellent water-skiing opportunities. The *Sacramento-San Joaquin Delta Boating Needs Assessment* (California Department of Boating and Waterways 2002) identifies the portion of Old River between Woodward/North Victoria Canal and Victoria Canal, as well as Victoria Canal itself, as preferred water-skiing locations. The study also notes that organized water-ski groups tend to use the Discovery Bay area and other private facilities within the south Delta for their activities. The Widow Island Ski Club is located on Old River south of the existing Intake and Pump Station, and the Discovery Bay Wakeboard and Ski Center is located off of Old River north of the existing Intake and Pump Station. Both likely use Old River and Victoria Canal for their activities.

The *Sacramento-San Joaquin Delta Boating Needs Assessment* (California Department of Boating and Waterways 2002) identifies Old River as a preferred fishing site. Boat fishing is possible in Old River and Victoria Canal, and fishing spots are likely the best along the tule reeds located on the edges of Old River and down the center of Victoria Canal. Anglers can fish for several species including salmon, striped bass, largemouth bass, sturgeon, and catfish. For further details on fisheries resources at the proposed project site, refer to Section 4.3, "Delta Fisheries and Aquatic Resources."

Land-based activities such as hunting, picnicking, and shoreline fishing are not legal at Victoria Island and Byron Tract due to prohibition of public access to the surrounding levees by Reclamation Districts (RDs) 800 and 2040; therefore, these activities do not

occur on-site. There are no existing trails or hunting access points at the proposed project site. There is a community park located in nearby Discovery Bay, and a bike trail is proposed along State Route (SR) 4. The *San Joaquin County General Plan* (1992) does not list the proposed project site as a significant resource area for recreation.

Desalination Alternative Project Sites

Bollman WTP and the Mallard Slough Intake and Pump Station are both located on private properties that are fenced and restricted from public access. As such, recreation does not occur at these sites, including Mallard Reservoir, which is located adjacent to the Bollman WTP. No parks or existing trails are located within close proximity of these sites.

Due to an easement for public use in the waterway, boaters and boat anglers can travel up Mallard Slough to the log boom on the north side of the intake structure; however, few boaters use the Slough. There are no boating facilities on Mallard Slough. The nearest boating facilities include two marinas east of Mallard Slough, the Pittsburg Yacht Club and Pittsburg Marina, and one marina west of Mallard Slough, McAvoy Marina. Table 4.15-2 lists the number of slips and amenities at each marina. The nearest fishing facility is located at Riverview Park, which has a fishing platform, restrooms, and picnicking facilities.

Table 4.15-2
Marinas near Mallard Slough

Marina Name	Location	Number of Slips	Amenities
City of Pittsburg Marina	Suisun Bay/Sacramento River	649	Restrooms, electricity, water, laundry, pumpout, club house, dock boxes, launch ramp, ice, fuel dock, restaurant, showers, groceries, guest facilities, parking, bait store, haul-out
Pittsburg Yacht Club	Suisun Bay/Sacramento River	None	Guest docks, restrooms, showers, restaurant
McAvoy Harbor	Suisun Bay/Sacramento River	299	Restrooms, electricity, water, launch ramp, ice, fuel dock, security gate, parking, picnic area, snack bar, clubhouse, restaurant/cafe

Source: The Log 2005; Easley, pers. comm., 2005

Public shoreline access to Mallard Slough from the landside is prohibited, as discussed above. Although the Slough margin is fenced to restrict access from the shoreline, some illegal access occurs to fish from shore.

Recreational activities in the Delta, including Suisun Bay where the new concentrate disposal pipeline would terminate, include boating, sport fishing, and other water-based activities. Available facilities include marinas, city or county public access areas, and yacht or ski clubs. Most of the navigable waterways in the Delta are public, and most of the land is private, thus limiting land-based recreation in the Delta.

Parks and trails near the Desalination Alternative project sites include California Seasons Neighborhood Park (south of Mallard Slough), Ambrose Park, and the Delta De Anza Trail, among others (Figure 4.7-2 in Section 4.7, "Land Use," identifies the locations of these and other park facilities). California Seasons Park, located 0.5 mile from the Mallard Slough Intake and Pump Station, is 2.5 acres in size, with picnic facilities, play areas, and sports facilities. The park is operated by the Pittsburg Recreation Department and maintained by the Pittsburg Public Works Department. Ambrose Park is a 13-acre park with numerous facilities including a soccer field, baseball field, Olympic-sized swimming pool, changing rooms, showers, bathrooms, barbeques, picnic tables, covered picnic areas, playgrounds, and a horseshoe area. The park is owned and managed by the Ambrose Recreation and Park District. The Delta De Anza Trail is a paved multi-use hiking, bicycling, and equestrian trail that spans over 15 miles and is owned and maintained by East Bay Regional Parks District (EBRPD). The Delta De Anza Trail is a recreational and transportation corridor, connecting central and eastern Contra Costa County communities. There is a planned extension to the Delta De Anza Trail, which would extend near Mallard Reservoir. Numerous other neighborhood and community parks are located in the area.

4.15.2 Environmental Consequences

4.15.2.1 Methods and Assumptions

Recreation resources analyzed for this section include waterways, parks, trails, and other recreational resources potentially affected by any of the components of the Proposed Action or alternatives. This evaluation is based on a general understanding of the uses and seasonality of use at the proposed project site and Desalination Alternative project sites.

4.15.2.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. An alternative was determined to result in a significant effect on recreational resources if it would:

- increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

In addition, an alternative was determined to result in a significant effect on recreational resources if it would:

- substantially reduce recreational opportunities or substantially degrade recreational experiences.

Neither the Proposed Action nor any of the project alternatives would include recreational facilities or require the construction or expansion of recreational facilities. Therefore, the second significance threshold listed above is not relevant to this analysis.

4.15.2.3 No-Action Alternative

Under the No-Action Alternative, no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Implementation of the No-Action Alternative would neither temporarily nor permanently affect existing recreational resources, opportunities, or experiences. The No-Action Alternative would have no direct or indirect effect on recreational resources and would not contribute to any cumulative recreational impacts.

4.15.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.15-a (Alternative 1)

Temporary Changes in Recreational Opportunities during Project Construction. *Implementation of the Proposed Action could adversely affect recreation during construction activities if boating is restricted and/or construction noise affects the recreational experience of boaters. Although these temporary disturbances may affect the recreation experience for boaters, displaced recreational uses could be accommodated by other nearby waterways and facilities. For this reason, and because of the temporary nature of this effect, this impact would be* ***less than significant****.*

The major construction components of the Proposed Action would be levee modification at the intake and pump station site, installation of the intake and fish screen, construction of the pump station and associated facilities at the intake site, installation of the pipeline across Victoria Island and across Old River, and connection to the Old River Distribution System. Typical heavy construction equipment would be used throughout the construction area, and a construction labor force averaging about 75 to 100 is expected to be present during an approximately 36-month construction period.

Land-based activities such as hunting, picnicking, and shoreline fishing are not legal at Victoria Island and Byron Tract due to prohibition of public access to the surrounding levees by RDs 800 and 2040, and therefore do not occur. There are no existing trails or hunting access points at the proposed project site.

Several water-related recreational opportunities exist along Old River and Victoria Canal, including boating, water skiing, and boat fishing, and could be temporarily affected by construction activities associated with the Proposed Action, particularly by in-water construction activities associated with installation of the intake site and fish screen on Victoria Canal and the intake conveyance pipeline across Old River.

In-water construction activities are described in Section 3.4.3, “Project Construction.” During construction of the new intake and fish screen on Victoria Canal, the north channel would be closed to public access for several hundred feet on either side of the intake. A barge would likely be used and could restrict the navigable waterway width. However, it is anticipated that the channel on the south side of the tule strip along the

center of the channel would remain unobstructed during construction. No speed or wake restrictions are anticipated. Overall, disturbance would be temporary, and recreationists could adapt to such disturbance by using other nearby areas that provide similar recreational opportunities.

Construction activities associated with installation of the new conveyance pipeline across Old River would involve either tunneling or crossing over the levees. If the second construction option is selected, a barge may be needed to complete construction activities and could restrict the navigable waterway width. CCWD would post notices at the three nearby marinas; alert the Widow Island Ski Club and Discovery Bay Wakeboard and Ski Center; and post signage (and buoys if necessary) near access points to Victoria Canal alerting boaters of construction activities, duration/schedule, contact person, and any necessary closures (and alternate routes/waterways).

Regardless of boating restrictions, construction noise would likely negatively affect the recreational setting, in turn negatively affecting the recreational experience and causing boaters, especially boat anglers, to avoid this area during loud construction periods. Although these temporary disturbances may affect the recreation experience for boaters, displaced recreational uses could be accommodated by other nearby waterways and facilities in the Delta. For this reason, and because of the temporary nature of this effect, this impact would be less than significant.

IMPACT 4.15-b (Alternative 1)

Long-term Changes in Recreation Opportunities Resulting from the Proposed Action. *Operation of the Proposed Action would not be expected to permanently affect existing water-related recreational opportunities (e.g., boating, water skiing, and boat fishing along Victoria Canal or Old River). This impact would therefore be* ***less than significant****.*

Once project construction is completed, Victoria Canal and Old River would generally be restored to their existing conditions and water-related recreation would continue.

The new intake fish screen on Victoria Canal would be expected to align "flush" with the existing top of the levee, so that the new structure would not protrude into the Canal. A new buoy line would be installed around the Victoria Canal intake to keep large debris, boaters, etc. away from the station and would extend approximately 15–25 feet in a semi-circle around the intake. As the channel width (on the north side from the tule brush in the center) is about 150 feet wide, boating access through both the north and south sides of the channel would not be substantially restricted.

Changes in water levels are not expected to be substantial enough such that recreation would be affected (see Section 4.2, "Delta Water Resources," for further details related to water levels). No long-term impacts to fisheries, and thus recreational boat fishing, are expected to result from the Proposed Action (see Section 4.3, "Delta Fisheries and Aquatic Resources," for further details related to fisheries).

As the Proposed Action would not permanently degrade or diminish existing water-related recreational opportunities along Victoria Canal and Old River, this impact would be less than significant.

Cumulative Impacts

No other projects described in Section 4.1, "Approach to the Environmental Analysis," in the vicinity of the proposed project site are expected to noticeably increase demand for recreational facilities, substantially affect recreational opportunities, or substantially degrade recreational experiences on Victoria Canal and Old River during the construction period for the proposed project facilities. CALFED's South Delta Improvements Program (SDIP) would result in the construction of permanent barriers in several south Delta channels and some channel dredging that could cause temporary impacts to in-water recreational activities, primarily boating, water skiing, and fishing, at these locations. Even if the Alternative Intake Project and SDIP channel improvements were constructed simultaneously, however, the large number of other unaffected waterways in the south Delta would serve the needs of recreationists in the Delta. Any disturbances that may affect the recreation experience for boaters would be temporary, and displaced recreational uses could be accommodated by other nearby waterways and facilities. Therefore, the Proposed Action would not result in a cumulatively considerable contribution to any significant cumulative impacts related to recreation.

Mitigation Measures

No mitigation is required.

4.15.2.5 Alternative 2, Indirect Pipeline Alternative

The direct, indirect, and cumulative impacts of Alternative 2 would be essentially the same as those described above for the Proposed Action. The impacts of Alternative 2 on recreational resources would be less than significant.

4.15.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 would be essentially the same as those described above for the Proposed Action. The impacts of Alternative 3 on recreational resources would be less than significant.

4.15.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.15-a (Alternative 4)

Temporary Changes in Recreational Opportunities during Project Construction. *Implementation of the Desalination Alternative could adversely affect recreation during construction activities, especially along the corridors for the new untreated-water conveyance pipeline and concentrate disposal pipeline, which would be adjacent to some local parks and trails. Water-based recreation could be affected at Suisun Bay during construction of the new concentrate disposal pipeline. Although construction activities would result in temporary disturbances to recreation, displaced recreational uses could be accommodated by other nearby facilities. For this reason, and because of the temporary nature of this effect, this impact would be* ***less than significant****.*

4.15 Recreation

The major construction components of the Desalination Alternative would be the new intake and pump station at Mallard Slough, untreated-water conveyance pipeline, desalination treatment facility, and concentrate disposal pipeline to Suisun Bay. Contractor construction equipment could include construction trailers, excavators, front-end loaders, a grader, and other heavy vehicles and equipment. Typical heavy construction equipment would be used throughout the construction area, and a construction labor force of about 10 to 150 is expected to be present during an approximately 30-36-month construction period.

Bollman WTP and the Mallard Slough Intake and Pump Station are both located on private properties than are fenced and restricted from public access. Consequently, recreation does not occur at these sites, including Mallard Reservoir, which is located adjacent to the Bollman WTP. No parks or existing trails are located within close proximity of these sites. Due to an easement for public use in the waterway, boaters and boat anglers can travel up Mallard Slough to the log boom on the north side of the intake structure; however, very few boaters have been seen in the Slough. There are no boating facilities on Mallard Slough.

The presence and movement of heavy construction equipment and construction-related generation of noise and dust would have the potential to temporarily degrade the existing recreational experience at or near the Desalination Alternative project sites, especially those adjacent to parks and trails. Any construction-related disturbances would be temporary. Due to the linear progression of construction work, it is expected that heavy construction activity would not be focused on any one area for the entire period. Further, numerous local parks and trails are located in the vicinity of the Desalination Alternative project sites and could be used by recreationists during construction.

As part of a traffic-control plan for this project, CCWD would coordinate with Contra Costa County, EBRPD, Ambrose Recreation District, and the Cities of Pittsburg and Concord to implement safe alternative bicycle and pedestrian access routes during construction. CCWD would provide temporary trail rerouting on adjacent streets during construction activities. CCWD would require its contractor to maintain the identified alternative bicycle and pedestrian access during construction by including such provisions in the construction contract.

Water-related recreational opportunities exist in the Delta near the Desalination Alternative project sites, including boating, fishing, and other water-based activities, and could be temporarily affected by construction activities, particularly in-water construction activities associated with the installation of the new concentrate disposal pipeline, which would extend into Suisun Bay.

In-water construction activities are described in Section 3.7.4, “Construction of the Desalination Alternative.” Construction activities associated with installation of the new concentrate disposal pipeline would involve dredging to create a trench for installing the pipeline along the existing bottom contour. Although safety buoys would be used and a barge would likely be needed, minimal impacts to the existing navigable width of the waterway would occur due to the Bay’s considerable expanse. No speed or wake

restrictions are anticipated. Overall, this would represent an inconvenience to recreationists, but would be temporary, and recreationists could adapt by using other nearby areas that provide similar recreational opportunities.

CCWD would post notices at nearby marinas and post signage (and buoys if necessary) near access points to Suisun Bay and the Mallard Slough area alerting boaters of construction activities, duration/schedule, contact person, and any closures (and alternate routes/waterways).

Although these temporary disturbances may affect the recreation experience for recreationists, displaced recreational uses could be accommodated by other nearby facilities. For this reason, and because of the temporary nature of this effect, this impact would be less than significant.

IMPACT 4.15-b (Alternative 4)

Long-term Changes in Recreation Opportunities Resulting from the Desalination Alternative. *Operation of the Desalination Alternative would not be expected to permanently affect existing land-based or water-related recreational opportunities at or near the Desalination Alternative project sites. This impact, therefore, would be* ***less than significant****.*

At completion of construction, Suisun Bay and Mallard Slough would be restored to pre-construction conditions. CCWD would ensure that all disturbed trails, bicycle lanes, and pedestrian areas are also restored to their pre-construction condition, to the extent consistent with pipeline operations. No parks or trails near the Desalination Alternative project sites would be permanently affected.

No long-term impacts to fisheries, and thus recreational fishing, are expected to result from the Desalination Alternative (see Section 4.3, "Delta Fisheries and Aquatic Resources," for further details related to fisheries).

As the Desalination Alternative would not permanently degrade or diminish existing recreational opportunities at or near the Desalination Alternative project sites, this impact would be less than significant.

Cumulative Impacts

No other projects described in Section 4.1, "Approach to the Environmental Analysis," in the vicinity of the Desalination Alternative project sites are expected to noticeably increase demand for recreational facilities or affect the availability or enjoyment of recreational opportunities at Suisun Bay and along the corridors for the new untreated-water conveyance pipeline and concentrate disposal pipeline during the construction period for the project facilities. Any disturbances that may affect the recreation experience would be temporary, and displaced recreational uses could be accommodated by other nearby facilities. Therefore, the Desalination Alternative would not result in a cumulatively considerable contribution to any significant cumulative impacts related to recreation.

Mitigation Measures

No mitigation is required.

4.16 Cultural Resources

This section includes an evaluation of the potential impacts on cultural resources that could result from project implementation. Cultural resources may include archaeological traces such as early Native American occupation sites and artifacts, historic-era buildings and structures, and places used for traditional Native American observances or places with special cultural significance. These materials can be found at many locations on the landscape, and along with prehistoric and historic human remains and associated grave-goods, are protected under various Federal, State, and local statutes, including Section 106 of the National Historic Preservation Act.

4.16.1 Affected Environment

Cultural resources may include prehistoric period sites, historical period sites, and areas of sacred and traditional concern to Native American tribes and other ethnic groups. An assessment of cultural resources that may be affected by implementation of the Proposed Action or alternatives is provided in the confidential technical report *Cultural Resources Survey for the Contra Costa Water District's Alternative Intake Project, Contra Costa and San Joaquin Counties, California* (EDAW 2006), on file at Reclamation's Sacramento office.

4.16.1.1 Regulatory Setting

Federal

Section 106 of the National Historic Preservation Act of 1966 (NHPA) and its implementing regulations (36 CFR 800, as amended in 1999) require Federal agencies to consider the effects of their undertakings, or those they fund or permit, on properties that may be eligible for listing, or that are listed in, the National Register of Historic Places (NRHP). The 36 CFR Part 60.4 regulations describe the criteria to evaluate cultural resources for inclusion in the NRHP. Cultural resources can be significant on the national, state, or local level. Such resources are required to retain integrity and must exhibit an association with broad patterns of our history, be associated with an important person, embody a distinctive characteristic, or yield information important to prehistory or history. These criteria are described more fully in Section 4.16.2.2 below.

The 36 CFR Part 800 regulations, implementing Section 106, call for considerable consultation with the State Historic Preservation Officer (SHPO), Indian tribes, and interested members of the public throughout the process. The four principal steps are:

1. Initiate the Section 106 process (36 CFR Part 800.3).

2. Identify historic properties, resources eligible for inclusion in the NRHP (36 CFR Part 800.4).

3. Assess the effects of the undertaking to historic properties within the area of potential effect (APE) (36 CFR Part 800.5).

4. Resolve adverse effects (36 CFR Part 800.6).

Adverse effects to historic properties are often resolved through preparation of a memorandum of agreement (MOA) developed in consultation between Reclamation, the SHPO, Indian tribes, and interested members of the public. The Advisory Council on Historic Preservation (ACHP) is also invited to participate. The MOA describes stipulations that treat the historic property to mitigate adverse effects.

The American Indian Religious Freedom Act (AIRFA) of 1978 is also applicable. This act established "the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions…including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites (P.L. 95-431)."

State

CEQA includes provisions that specifically address the protection of cultural resources. These protections are described below in Section 4.16.2.2, Significance Criteria." The Office of Historic Preservation (OHP), headed by the SHPO, is responsible for administration of Federally mandated and State-mandated historic preservation programs in California. As noted above, Federal agencies must initiate consultation with the SHPO as part of the NHPA Section 106 review process. The State Historical Resources Commission, also headed by the SHPO, determines the eligibility of historic and archaeological resources for listing on the NRHP and the California Register of Historic Resources (CRHR). The eligibility criteria for listing in the CRHR are similar to those for NRHP listing but focus on importance of the resources to California history and heritage. The criteria are described in Section 4.16.2.2 below.

The Native American Heritage Commission identifies and catalogs places of special religious or social significance to Native Americans and known graves and cemeteries of Native Americans on private lands, and performs other duties regarding the preservation and accessibility of sacred sites and burials and the disposition of Native American human remains and burial items.

4.16.1.2 Environmental Setting

A detailed description of the prehistoric setting of the general project area, and ethnographic and historical contexts of the proposed project site and Desalination Alternative project sites are included in *Cultural Resources Survey for the Contra Costa Water District's Alternative Intake Project, Contra Costa and San Joaquin Counties, California* (EDAW 2005).

Victoria Island/Byron Tract Project Site

Ethnographic Context

The Northern Valley Yokuts occupied the proposed project area, that is, the land on each side of the San Joaquin River from the Delta to south of Mendota. Yokuts' occupation of

the northern parts of the range may be relatively recent, as linguistic evidence points toward an earlier Miwok occupation. Euro-American contact with the Northern Valley Yokuts began with infrequent excursions by Spanish explorers in the late 1700s to early 1800s. Many Yokuts were lured or captured by missionaries and scattered among the various missions. However, major impacts on the native peoples of the region came with the malaria epidemic of 1833, and the influx of Europeans during the gold rush era further reduced the population.

Historical Context
The proposed project site is situated on what was originally the *Paso del Pescadero* land grant. The development of agriculture in this region began in the 19th century, and both San Joaquin and Contra Costa Counties are still considered agriculturally rich regions in California.

Land reclamation, an integral part of agriculture, began as early as 1849 in the Delta with the construction of levees around Grand Island. Land reclamation in the project vicinity was initiated by the Tide Land Reclamation Company, which partially reclaimed Union Island, of which Victoria Island was once a part, before selling it in 1875. By winter 1876, approximately 45 miles of levees were under construction. Land reclamation of Byron Tract began with a 4.5-foot levee along Old River in 1870–1874. Flooding in 1875 led to the enlargement of the levee to the south in 1877; however, it would be several years later (ca. 1900) before the land would be fully reclaimed.

Desalination Alternative Project Sites

Ethnographic Context
The Chupcan tribelet of the Bay Miwok occupied the south shore of Suisun Bay extending from Port Chicago to the mouth of Marsh Creek on the west, with a tribelet center at Antioch (Bennyhoff 1977, Levy 1978). Permanent villages were usually surrounded by a number of temporary and seasonal camps. Politically autonomous, the groups of 50–500 individuals followed an annual round of subsistence activities focused on the gathering of botanical, riparian, and aquatic resources. Trade was common with other groups in the region, the Central Valley, and Sierra Nevada.

Historical Context
The historic period began with Spanish explorations, which were followed by the founding of presidios, missions, and towns (1769–1821). As opposed to land ownership by the Crown, later rule by Mexico stressed individual ownership of the land, and vast tracts of mission lands were granted to individuals. While some of the Desalination Alternative project sites are located within ungranted lands, others are situated within the *Rancho Monte del Diablo*, which includes parts of Clyde and Concord, and *Rancho Los Medanos*, which includes Pittsburg and part of Antioch. Subdivision and development of the ranchos began in the 19th century with the growth in population. Early historic agricultural activities dominated the economy during the early period and into contemporary times. Additional development of the area primarily resulted from regional railroad connections, which provided transportation for agricultural and industrial

commodities. In recent decades, an agrarian land-use pattern has been replaced by housing developments, military bases, commercial centers, and light industrial facilities.

Cultural Resource Study Methodology and Findings

Cultural resource investigations for the Victoria Island and Byron Tract project site consisted of a staged approach that included Native American consultation, pre-field research, field surveys, and resource documentation. All aspects of the cultural resource study were conducted in accordance with the *Secretary of the Interior's Guidelines for Identification of Cultural Resources* (48 CFR 44720-23).

Native American Consultation

Implementing regulations for Section 106 require that Federal agencies identify potentially affected Indian tribes that might have knowledge of sites of religious and cultural significance in the APE (36 CFR 800.3[f][2]). If any such properties exist, the regulations require that Federal agencies invite Indian tribes to participate in the Section 106 process as consulting parties. In accordance with Section 106 requirements, and prior to conducting fieldwork, EDAW consulted with the Native American Heritage Commission (NAHC). Responses from the NAHC indicated that a record search of the sacred land files did not indicate the presence of Native American cultural resources or areas of cultural sensitivity in the immediate vicinity of the Victoria Island/Byron Tract APE or the Desalination Alternative APE (i.e., near the proposed project site or the Desalination Alternative project sites). Input from the NAHC-designated Native American contacts for San Joaquin and Contra Costa Counties was also solicited. One telephone response, from Ohlone representative Katherine Erolinda Perez, was received with regard to the Victoria Island/Byron Tract APE. Ms. Perez expressed concern regarding the overall sensitivity of the Delta area for containing early Native American resources. No response has been received to date regarding the Desalination Alternative APE.

Pre-Field Research

EDAW's research into cultural resource issues for the Proposed Action and alternatives began with a records search of pertinent cultural resource information conducted at the Northwest and Central California Information Centers (NWIC and CCIC). The records search included review of the California Historical Resources Information System (CHRIS), the NRHP (National Park Service 1996), the California Register of Historical Resources (CRHR) (State of California 1976), numerous other State and county historic resource listings, and historic plat maps and U.S. Geological Survey (USGS) maps.

Previous Archaeological Investigations

The files maintained at the NWIC and CCIC illustrated previously conducted archaeological investigations that occurred within one-half mile of the proposed project site. A list of past investigations directly related to the Victoria Island/Byron Tract area is presented in Table 4.16-1, and a list of investigations conducted in the area of the Desalination Alternative project sites is presented in Table 4.16-2.

Table 4.16-1
Previous Cultural Resource Investigations of the Victoria Island/Byron Tract Area

Report Title	Author and Date
Sacramento-San Joaquin Delta, California, Historical Resources Overview	Owens 1991
A Class III Archeological Survey of the South Delta Water Management Program Area, San Joaquin and Contra Costa Counties, California	West 1994
Cultural Resources Inventory of Caltrans District 10, Rural Conventional Highways, Volume I	Leach-Palm et al. 2004a
Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways, Volume III	Rosenthal and Meyer 2004
Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways, Volume II	Leach-Palm et al. 2004b
Source: Data compiled by EDAW in 2005	

Table 4.16-2
Previous Cultural Resource Investigations in the Vicinity of the Desalination Alternative Project Sites

Report Title	Author and Date
Archaeological Reconnaissance of the Mason Industrial Park, Contra Costa County, California	Baker 1981
Cultural Resources Evaluations for the Pittsburgh-Antioch Alternatives Analysis, Contra Costa County, California	Chavez and Woodbridge 1988
Archaeological Resources Inventory for Los Vaqueros Water Conveyance Alignments, Contra Costa County, California	Bramlette et al. 1991
Cultural Resources Overview, Naval Weapons Station, Concord, Contra Costa County, California	Self et al. 1993
Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project	Hatoff et al. 1995
East/Central Contra Costa County Wastewater Management Plan, California, Cultural Resources Survey	Busby 1976
Class II Archaeological Survey of the Contra Costa Canal, Contra Costa County, California	West and Welch 1996
Cultural Resources Survey Naval Weapons Station (NWS), Concord Port Terminal Operations and Administration Building, Contra Costa County, California	Carbone and Woodman 1997
Archaeological Inventory, Proposed Warehouse Locations D-F, G North and G South, Naval Weapons Station, Concord, Contra Costa County, California	Busby 1997
Archaeological Survey Report, 05-CCO, Delta De Anza Trail (Caltrans)	Guedon and Busby 1996
Cultural Resource Inventory Report for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Pittsburg to Sacramento, California	Jones & Stokes 1999

Table 4.16-2
Previous Cultural Resource Investigations in the Vicinity of the Desalination Alternative Project Sites

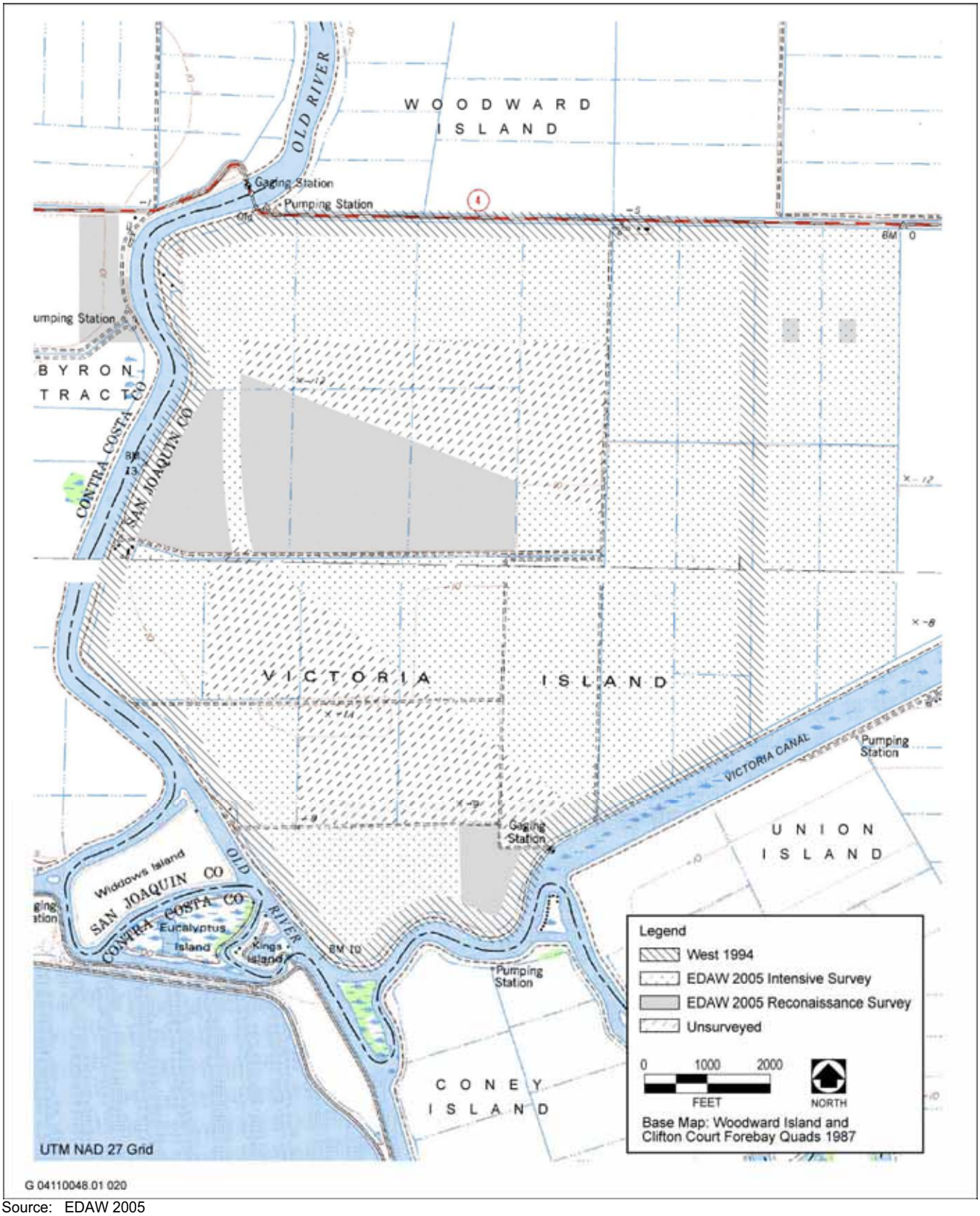
Report Title	Author and Date
Contra Costa County Water Multipurpose Pipeline Project, Environmental Documentation Study, Cultural Resources Review (letter report)	Busby 1997
Cultural Resources Assessment of the Mallard Slough Pump Station Project, Bay Point, Contra Costa County, California	Peak and Associates 1998
Historic Property Survey Report/Finding of Effect, Contra Costa Water District Rollman Flocculation and Sedimentation Upgrade Project, 2015 Bates Avenue, Concord, Contra Costa County	Busby et al. 2000
Historic Resources Evaluation Report, Proposed Interstate 680 / State Route 4 Interchange, Contra Costa County, California	JRP Historical Consulting Services 2003a
Historical Resources Evaluation Report, Replacement of the Somersville Road Bridge over the Contra Costa Canal	JRP Historical Consulting Services 2003b
Source: Data compiled by EDAW in 2005	

Victoria Island/Byron Tract

The work conducted by Owens (1991) did not include any field surveys but consisted of an overview of historical resources based upon archival research. James West (1994) conducted field investigations for the South Delta Water Management Program, which included a section of the levee along the east side of Old River and the north side of Victoria Canal, as well as a survey within the proposed project site (specifically, in the area where the new pipeline would be located). This survey is depicted in Exhibit 4.16-1. Recent work conducted for Caltrans (Leach-Palm et. al 2004a, 2004b; Rosenthal and Meyer 2004) occurred directly adjacent to and north of the area for the new pipeline. None of these studies identified resources at the proposed project site; however, one site that is eligible for NRHP listing, the bridge on State Route (SR) 4 spanning Old River, is listed on the CRHR.

Desalination Alternative Project Sites

Large portions of the Desalination Alternative project sites and their surroundings have been subjected to previous investigations that have documented a total of four resources that may be affected by the Desalination Alternative. These resources are the Contra Costa Canal, which is considered eligible for NRHP listing under Criterion A (JRP Historical Consulting Services 2003a); the bridge on Canal Road west of Bailey Avenue in Bay Point that crosses the Contra Costa Canal, which has also been determined to be eligible for NRHP listing as a contributing element to the canal (JRP Historical Consulting Services 2003b); the Old Mallard Slough Pump Station, which was found not eligible for the CRHR (Peak and Associates 1998); and a short segment of the Central Pacific Railroad (now Union Pacific Railroad), which has been determined to be eligible for listing in the NRHP under Criterion A (Jones & Stokes 1999).



Source: EDAW 2005

Cultural Resources Field Survey Map

EXHIBIT 4.16-1

Field Survey Results
EDAW archaeologists conducted an intensive field survey of the accessible portions of the proposed project site in June 2005. This survey incorporated pedestrian transects spaced no greater than 50 feet. Encountered cultural resources were recorded utilizing global positioning system (GPS) technology and documented on California Department of Parks and Recreation (DPR) Series 523 Primary records.

Two isolated cultural resources were documented within the Victoria Island property; these consist of a single obsidian biface fragment and a widely dispersed scatter of early to mid-20th century debris. Neither of these resources is considered significant according to the criteria of eligibility for listing either on the NRHP or in the CRHR. No resources were documented within the Byron Tract property, although a complete examination of the ground surface was precluded by heavy crop cover consisting of recently mown hay. Heavy crop cover also prevented a complete survey of portions of Victoria Island lands primarily within the area of the direct pipeline alignment corridor. It is important to note that while relatively few cultural resources were documented during the intensive survey, significant resources could be present in subsurface contexts. Given the agriculturally altered and uniform nature of the present-day topography, it is not possible to predict whether or where such resources could be encountered during project-related ground-disturbing activities. Exhibit 4.16-1 shows those portions of the proposed project site on Victoria Island that were subjected to intensive field surveys and those that were subjected to reconnaissance-level surveys due to heavy crop cover.

Field surveys of the Desalination Alternative project sites, most of which are developed sites, were not conducted for this study.

4.16.2 Environmental Consequences

4.16.2.1 Methods and Assumptions
The assessment of impacts of project construction activities was conducted using the significance criteria presented below. Existing information sources cited above and field survey results were used as the baseline data upon which to analyze project effects.

4.16.2.2 Significance Criteria
CEQA and NHPA criteria were used to determine the significance of impacts on cultural resources.

Under CEQA, the thresholds for determining the significance of impacts are based on the environmental checklist in Appendix G of the State CEQA Guidelines. An alternative is determined to result in a significant effect on cultural resources if it would:

- cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5 of the State CEQA Guidelines;

- cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5 of the State CEQA Guidelines; or
- disturb any human remains, including those interred outside of formal cemeteries.

Section 15064.5 generally defines historical resources as (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR; (2) a resource included in a local register of historical resources or identified as significant in a historical resource survey; and (3) any other object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant provided the lead agency's determination is supported by substantial evidence. A substantial adverse change in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired.

A cultural resource may be eligible for listing on the CRHR if it:

1) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2) is associated with the lives of persons important in our past;

3) embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of an important creative individual or possesses high artistic values; or

4) has yielded, or may be likely to yield, information important in prehistory or history.

Section 15064.5 generally defines a significant archaeological site as one that is a historical resource or one that meets the definition of a unique archaeological resource in Public Resources Code section 21083.2.

Under the NHPA and the 36 CFR Part 800 regulations, the criteria for assessing adverse effects on cultural resources is guided by the specific legal context of the site's significance as set out in Section 106 of the NHPA (16 USC 470), as amended. A property may be listed in the NRHP if it meets criteria for evaluation defined in 36 CFR 60.4:

> The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess a artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history.

Most prehistoric archaeological sites are evaluated with regard to Criterion d of the NRHP, which refers to site data potential. Such sites typically lack historical documentation that might otherwise adequately describe their important characteristics. Archaeological methods and techniques are applied to gain an understanding of the types of information that may be recovered from the deposits. Data sought are those recognized to be applicable to scientific research questions or to other cultural values. For example, shellfish remains from an archaeological deposit can provide information about the nature of prehistoric peoples' diet, foraging range, exploited environments, environmental conditions, and seasons during which various shellfish species were taken. These are data of importance to scientific research that can lead to the reconstruction of prehistoric life-ways. Some archaeological sites may be of traditional or spiritual significance to contemporary Native Americans or other groups, particularly those sites that are known to contain human burials.

Site integrity is also a consideration for the NRHP eligibility of an archaeological locale. The aspects of prehistoric resources for which integrity is generally assessed include location, setting design, workmanship, feeling, and association. These may be compromised to some extent by cultural and post-depositional factors (e.g., highway construction, erosion, bioturbation, etc.), yet the resource may still retain its integrity for satisfying Criterion d if the important information residing in the site survives. Conversely, archaeological materials such as shell may not be present in sufficient quantity or may not have adequate preservation for accurate identification. Thus, their potential as data to address important research questions is significantly reduced. Assessment of these qualities is particularly important for archaeological properties where the spatial relationships of artifacts and features are necessary to determine the patterns of past human behavior.

4.16.2.3 No-Action Alternative

No ground-disturbing activities would occur as a result of this alternative. Consequently, no indirect or direct impacts on cultural resources would occur.

There are no direct or indirect impacts expected from the No-Action Alternative; therefore, there would be no incremental contributions to any cumulative impact to cultural or historic resources.

4.16.2.4 Alternative 1, Direct Pipeline Route (Proposed Action)

Significant cultural resource impacts could result only from construction-related effects; project operations would not have any effects on cultural resources.

Direct and Indirect Impacts

IMPACT 4.16-a (Alternative 1)

Damage to or Destruction of Previously Undiscovered Cultural Resources on the Project Site. *The entire project site could not be surveyed because of ground conditions. Significant cultural resources could be present in these areas, and could be damaged by construction. Construction of the proposed project facilities could also damage or destroy previously unknown significant or potentially significant buried archaeological resources in areas that were included in the field survey. This direct impact would be* ***potentially significant****.*

The proposed project site is located in the Delta region, where significant prehistoric and historic-era cultural resources have been documented. Cultural resource investigations conducted to date have not identified the presence of any significant or potentially significant cultural resources on the proposed project site. However, portions of the site could not be surveyed for this study because of heavy crop ground cover, especially along the direct pipeline alignment (see Exhibit 4.16-1). Although not expected, given the results of the field survey and the records searches, significant cultural resources could be present in these areas and could be damaged by construction.

In addition, there is a potential for unrecorded significant cultural resources to be unearthed or otherwise discovered during ground-disturbing construction activities in areas that were covered in the field survey. Damage to or destruction of previously unidentified significant cultural resources would be a significant impact. Because there is the potential for such damage to occur, this impact would be potentially significant.

IMPACT 4.16-b (Alternative 1)

Discovery of Human Remains during Construction. *Buried human remains could be encountered during project construction, causing damage to or destruction of such remains. This direct impact would be* ***potentially significant****.*

While no evidence for prehistoric or early historic interments was found in the proposed project site in surface contexts, this does not preclude the existence of buried human remains. California law recognizes the need to protect historic era and Native American human burials, skeletal remains, and items associated with Native American interments from vandalism and inadvertent destruction. The procedures for the treatment of Native American human remains are contained in California Health and Safety Code Section 7050.5 and Section 7052 and California Public Resources Code Section 5097.

It is possible that previously unknown buried human remains could be unearthed and damaged or destroyed during excavation activities associated with the Proposed Action, such as grading, preparation and use of staging areas, excavation of the borrow areas, and stockpiling. Damage to or destruction of human remains during project construction or other project-related activities would be considered significant. Because there is potential for such damage to occur, this direct impact would be potentially significant.

Cumulative Impacts

Construction activities associated with the Proposed Action have the potential to adversely affect previously unknown cultural and historic resources. Mitigation included below would be implemented to address potential direct effects on these resources.

Because no known historic or archaeological resources exist on the project site, the project would not be expected to contribute to any cumulative effects on similar types of cultural resources. Therefore, the Proposed Action would not make a cumulatively considerable contribution to any significant effect on cultural or historic resources.

Mitigation Measures

Mitigation Measure 4.16-a(1) (Alternative 1): Survey Previously Unexamined Areas before the Beginning of Any Project–Related Ground Disturbance in These Areas, and Implement Further Mitigation as Necessary.

Before the beginning of any project construction activity that could affect the previously unsurveyed portions of the project site, qualified archaeologists shall survey all portions of the site that were not examined during intensive surveys for the current effort. These areas include portions of the direct pipeline alignment (see Exhibit 4.16-1). The survey shall be conducted during a time when vegetation can be reduced or cleared from the affected area, so the natural ground surface can be examined for traces of prehistoric and/or historic-era cultural resources. Surveys of these areas would not be necessary if it is determined that they would not be affected by any project construction-related activity, including equipment staging or material stockpiling.

If the survey reveals the presence of cultural resources on the project site, the procedures outlined in Mitigation Measure 4.16-a(2) (Alternative 1) shall be followed.

Implementation of this measure would reduce the potential impacts on resources in previously unsurveyed areas to a less-than-significant level.

Mitigation Measure 4.16-a(2) (Alternative 1): Restrict Ground Disturbance and Implement Measures to Protect Archaeological Resources if Discovered during Surveys or Ground-Disturbing Activities.

If unrecorded cultural resources (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, structure/building remains, etc.) are encountered during surveys of previously unexamined areas where ground disturbance is planned or during project-related ground-disturbing activities, all ground-disturbing activities shall be restricted from being conducted within a 100-foot radius of the find. A qualified archaeologist shall identify the materials, determine their possible significance according to NRHP and CEQA (including CRHR) criteria, and formulate appropriate measures for their treatment, which shall be implemented by CCWD and its contractors. Potential treatment methods for significant and potentially significant resources may include, but would not be limited to, no action (i.e., resources determined not to be significant), avoidance of the resource through changes in construction methods or project design, and implementation of a program of testing and data recovery, in accordance with all applicable Federal and State requirements.

Implementation of this mitigation measure would ensure proper identification and treatment of any significant cultural resources uncovered as a result of project-related ground disturbance and would reduce the potential impact resulting from inadvertent damage or destruction of unknown cultural resources during construction to a less-than-significant level.

Mitigation Measure 4.16-b (Alternative 1): Stop Potentially Damaging Work if Human Remains Are Uncovered During Construction, Assess the Significance of the Find, and Pursue Appropriate Management.

California law recognizes the need to protect interred human remains, particularly Native American burials and associated items of patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code §7050.5 and §7052 and California Public Resources Code §5097.

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, all such activities within a 100-foot radius of the find shall be halted immediately and CCWD's designated representative shall be notified. CCWD shall immediately notify the county coroner and a qualified professional archaeologist. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). CCWD's responsibilities for acting upon notification of a discovery of Native American human remains are identified in detail in the California Public Resources Code Section 5097.9. CCWD or its appointed representative and the professional archaeologist shall contact the Most Likely Descendent (MLD), as determined by the NAHC, regarding the remains. The MLD, in cooperation with the property owner and the lead agencies shall determine the ultimate disposition of the remains.

With implementation of these actions, any adverse impact would be reduced or eliminated. Therefore, this mitigation measure would reduce the direct impact to a less-than-significant level.

4.16.2.5 Alternative 2, Indirect Pipeline Route

The direct, indirect, and cumulative impacts of Alternative 2 would be essentially the same as those described for the Proposed Action. Implementation of the mitigation described for the Proposed Action would reduce any potentially significant impacts to less-than-significant impacts.

4.16.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 would be identical to those described for the Proposed Action. Implementation of the mitigation measures described for the Proposed Action would reduce any potentially significant impacts to less-than-significant impacts.

4.16.2.7 Alternative 4, Desalination Alternative

Significant impacts could result only from construction-related effects; project operations would not have any effects on cultural resources.

Direct and Indirect Impacts

IMPACT 4.16-a (Alternative 4)

Damage to or Destruction of Previously Undiscovered Cultural Resources on the Project Sites. *The Desalination Alternative project sites have not been surveyed for cultural resources for this study. Significant cultural resources could be present in these areas and could be damaged by construction. This direct impact would be* ***potentially significant****.*

Field surveys for cultural resources were not conducted for this study at the Desalination Alternative project sites. The Desalination Alternative facilities would be sited in several urbanized areas and some undeveloped areas. Some of the latter have been investigated for the presence of cultural resources during previous studies. However, portions of the Desalination Alternative project sites have not been surveyed. Significant undiscovered cultural resources could be present in these areas, and could be damaged by construction. Damage to or destruction of significant cultural resources during construction would be considered significant. Because there is the potential for such damage to occur, this impact would be potentially significant.

IMPACT 4.16-b (Alternative 4)

Damage to or Destruction of Unknown Human Remains during Construction. *Buried human remains could be discovered during project construction, causing damage to or destruction of such remains. This direct impact would be* ***potentially significant****.*

This impact would be essentially the same as Impact 4.16-b (Alternative 1). It is possible that undiscovered buried human remains could be unearthed and damaged or destroyed during excavation activities associated with the Proposed Action, such as grading, preparation and use of staging areas, excavation of the borrow areas, and stockpiling. Damage to or destruction of human remains during project construction or other project-related activities would be considered significant. Because there is potential for such damage to occur, this direct impact would be potentially significant.

IMPACT 4.16-c (Alternative 4)

Damage to or Destruction of Documented Cultural Resources. *Four cultural resources have been identified at or near Desalination Alternative project sites. The Central Pacific Railroad (now Union Pacific Railroad) as a whole is eligible for listing in the NRHP under Criterion A, but has been substantially modified in the project vicinity and would not be affected by the project. The Contra Costa Canal and a bridge crossing the canal in the project vicinity are eligible for listing but would not be affected by the construction of the project facilities. This direct impact would be* ***less than significant****.*

Previous investigations have identified four cultural resources at or adjacent to the Desalination Alternative project sites: the existing Mallard Slough pump station, the route of the Central Pacific Railroad, the Contra Costa Canal, and a bridge crossing the canal in Bay Point. The existing Mallard Slough pump station was found not to be eligible for CRHR listing (Peak and Associates 1998). Therefore, although construction of the

Desalination Alternative facilities would permanently change the appearance of the pump station, this would not be a significant cultural resource impact. The route of the Central Pacific Railroad (now Union Pacific Railroad) as a whole has been determined to be eligible for listing in the NRHP under Criterion A (Jones & Stokes 1999); however, the segment at or adjacent to the Desalination Alternative project sites has been extensively upgraded and modified, thereby adversely affecting the historic fabric and precluding it from being considered as a contributing element of an NRHP-eligible site. For this reason and because construction of project facilities would not affect this resource, implementation of the Desalination Alternative would not have a significant cultural resource effect with regard to this resource. The Contra Costa Canal and the bridge across the canal on Canal Road west of Bailey Avenue in Bay Point were determined to be eligible for NRHP listing. Pipeline installation would temporarily disturb the land along a portion of the alignment of the Contra Costa Canal without affecting the long-term appearance or function of the canal itself or the bridge at Canal Road. Therefore, the project would not cause a substantial adverse change in the significance of these resources. Because the Desalination Alternative would not cause a substantial adverse change in the significance of any historical or archaeological resource, this direct impact would be less than significant.

Cumulative Impacts

Construction activities associated with the Desalination Alternative have the potential to affect previously unknown cultural and historic resources. Mitigation included below would be implemented to address potential direct effects on these resources and would reduce these impacts to less-than-significant levels.

Because no known historic or archaeological resources would be affected by the Desalination Alternative, the alternative would not be expected to contribute to any cumulative effects on similar types of cultural resources. Therefore, the Desalination Alternative would not make a cumulatively considerable contribution to any significant effect on cultural or historic resources.

Mitigation Measures

Mitigation Measure 4.16-a(1) (Alternative 4): Survey Previously Unexamined Areas before the Beginning of Any Project–Related Ground Disturbance in These Areas, and Implement Further Mitigation as Necessary.

Qualified archaeologists shall survey all portions of the Desalination Alternative project sites that would be subjected to any surface disturbance from project construction activities that have not previously been surveyed. The survey shall be conducted before activities associated with project construction are initiated. If the survey reveals the presence of cultural resources on a project site, Mitigation Measure 4.16-a(2) (Alternative 4) shall be implemented.

Implementation of this measure would reduce the potential impacts on resources in previously unsurveyed areas to a less-than-significant level.

Mitigation Measure 4.16-a(2) (Alternative 4): Restrict Ground Disturbance and Implement Measures to Protect Archaeological Resources if Discovered during Surveys or Ground-Disturbing Activities.
This mitigation measures is the same as Mitigation Measure 4.16-a (2) (Alternative 1) described for the Proposed Action. Implementation of this mitigation measure would reduce potentially significant impacts resulting from inadvertent damage or destruction of unknown cultural resources during construction to a less-than-significant level.

Mitigation Measure 4.16-b (Alternative 4): Stop Potentially Damaging Work if Human Remains Are Uncovered During Construction, Assess the Significance of the Find, and Pursue Appropriate Management.
This mitigation measures is the same as Mitigation Measure 4.16-b (Alternative 1) described for the Proposed Action. This mitigation would reduce the direct impact to a less-than-significant level.

4.17 Paleontological Resources

This section includes an evaluation of the potential impacts on paleontological resources (the fossil remains of prehistoric animals and plants) that could result from project implementation.

4.17.1 Affected Environment

4.17.1.1 Regulatory Setting

The Antiquities Act of 1906, as amended (PL 59-209; 34 Stat. 225; 16 USC 431–433), is the earliest and most basic legislation for protecting cultural resources on Federal lands. It provides misdemeanor-level criminal penalties to control unauthorized uses. Appropriate scientific uses may be authorized through permits, and materials removed under a permit must be permanently preserved in a public museum. The 1906 Act is broader in scope than the 1979 Archaeological Resources Protection Act, which partially supersedes it. Uniform regulations at 43 CFR Part 3 implement the Act.

Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (43 CFR 3), "objects of antiquity" has been interpreted to include fossils by several Federal agencies. Permits to collect fossils on lands administered by Federal agencies are authorized under this Act, and projects involving Federal lands require permits for both paleontological resource evaluation and mitigation efforts. This Act would apply to portions of the Desalination Alternative, which would cross federal lands.

There are no State or local plans, policies, regulations, and laws related to paleontological resources that apply to the Proposed Action or alternatives.

4.17.1.2 Environmental Setting

Victoria Island and that portion of Byron Tract surrounding the existing Old River intake facilities (including the Byron Tract staging area) are composed of Holocene (10,000 BC) flood basin deposits referred to as the "Dos Palos Alluvium" by Wagner et al. (1987) and Lettis (1982).

The Desalination Alternative project facilities would be located within the following sedimentary deposits, as mapped by Helley and LaJoie (1979):

- The existing Mallard Slough intake and pump station are located in "Qhbm" sediments referred to as Holocene bay mud, composed of unconsolidated water-saturated dark plastic carbonaceous clay and silty clay.

- The existing Bollman WTP is located in "Qhaf" sediments composed of fine-grained Holocene alluvium composed of plastic, moderately- to poorly-sorted carbonaceous silt and clay.
- The new untreated-water conveyance pipeline would be located in sediments denoted as "Qham," medium-grained Holocen alluvium, and "Qpa," late Pleistocene (70,000 to 10,000 years BC) alluvium composed of irregularly interbedded clay, silt, sand, and gravel from older stream channels and terraces.
- The new desalination treatment facility site (near Mallard Reservoir) would also be located in "Qhaf" sediments.
- The new concentrate disposal pipeline to Suisun Bay would be located on "Qpa" sediments consisting, in this location, primarily of fresh-water marsh deposits.

4.17.2 Environmental Consequences

4.17.2.1 Methods and Assumptions

A stratigraphic inventory and paleontological resource inventory were completed to develop a baseline paleontological resource inventory of the proposed project site and surrounding area by rock unit, and to assess the potential paleontological productivity of each rock unit. For the stratigraphic inventory, geologic maps and reports covering the geology of the proposed project site and surrounding area were reviewed to determine the exposed rock units and to delineate their respective distributions in the area. Published and unpublished geological and paleontological literature was reviewed to document the number and locations of previously recorded fossil sites from rock units exposed in and near the proposed project site and the surrounding region, as well as the types of fossil remains each rock unit has produced. The literature review was supplemented by an archival search conducted at the University of California, Museum of Paleontology (UCMP) in Berkeley, California, on June 10, 2005.

4.17.2.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its effects. An alternative was considered to have a significant effect on a paleontological resource if it would:

- destroy a unique paleontological resource or site or unique geologic feature.

A paleontologically important rock unit is one that has a high rating for potential paleontological productivity and is known to have produced unique, scientifically important fossils. The potential paleontological productivity rating of a rock unit exposed at a project site refers to the abundance and densities of fossil specimens and/or

previously recorded fossil sites in exposures of the unit in or near the proposed project site.

4.17.2.3 No-Action Alternative

No ground-disturbing activities would occur as a result of this alternative. Consequently, no indirect or direct impacts on paleontological resources would occur, and the No-Action Alternative would make no incremental contributions to any cumulative impact on paleontological resources.

4.17.2.4 Alternatives 1, 2, and 3

Construction activities in any portion of Victoria Island as well as the eastern portion of Byron Tract would take place in sediments referable to the Dos Palos Alluvium, which is composed of Holocene flood basin deposits. To be considered a fossil, by definition, an object must be more than 10,000 years old. Therefore, construction activities associated with the Proposed Action, Alternative 2, or Alternative 3 would have no direct or indirect impacts on paleontological resources, and would not contribute to any cumulative effect on paleontological resources.

4.17.2.5 Alternative 4, Desalination Alternative

Significant impacts could result only from construction-related effects; project operations would not have any effects on paleontological resources.

Direct and Indirect Impacts

IMPACT 4.17-a (Alternative 4)

Potential Disturbance of Paleontological Resources During Earth-Moving Activities. *Because portions of the facilities and pipelines associated with the Desalination Alternative would be constructed within a paleontologically sensitive rock unit, construction activities in these areas could damage previously unknown fossil resources. This direct impact would be* ***potentially significant****.*

The Desalination Alternative project sites associated with Holocene alluvium (Qham and Qhaf) would not be located on sediments that contain fossils. However, some of the Desalination Alternative facilities would be constructed on areas of late Pleistocene alluvium (Qpa), which is a well-known paleontologically sensitive rock unit that has yielded fossils of continental vertebrate fauna including camel, bison, horse, ground sloth, and mammoth, among others (Helly and LaJoie 1979; Jefferson 1991a and 1991b; Lundelius et al. 1983; Savage 1951; Stirton 1939).

Results of a paleontological record search at the U.C. Berkeley Museum of Paleontology indicated several recorded vertebrate fossil localities within the immediate vicinity of the new untreated-water conveyance pipeline. The closest recorded vertebrate fossil site within Pleistocene alluvium is UCMP locality V4505, approximately 0.5-mile south of the Contra Costa Canal near Port Chicago. This site yielded remains from a Rancholabrean-age *Cynodesmus* (a large, hyena-like animal), tapir, and horse. Additional vertebrate fossil sites in Pleistocene alluvium have been recorded along the Contra Costa Canal and the Mokelumne Aqueduct near Pittsburg and Antioch (UCMP localities V91184, V6030, and V6007). However, because those portions of the proposed untreated-water conveyance pipeline that would be constructed within Pleistocene

alluvium would be located entirely within the existing Contra Costa Canal right-of-way, any fossil remains that may have been present would already have been affected by construction of the existing canal. Thus, the potential for construction of the new untreated-water conveyance pipeline to disturb paleontological resources would be less than significant.

The new concentrate disposal pipeline would be located on Pleistocene alluvium. Results of a paleontological record search at the U.C. Berkeley Museum of Paleontology indicated several recorded vertebrate fossil localities within the immediate vicinity of the desalination treatment facility site and the concentrate disposal pipeline alignment. The closest recorded vertebrate fossil sites within Pleistocene alluvium are UCMP localities V1359 and V1363, approximately 1.5 miles west of the concentrate disposal pipeline alignment and 3 miles north of the desalination treatment facility site between Waterfront Road and Suisun Bay. These two sites yielded eight different fossil specimens from a Rancholabrean-age horse and ground sloth. UCMP locality V6628, approximately 3 miles west of the desalination treatment facility site, on the west side of Interstate (I) 680, yielded fossils from a Rancholabrean-age mammoth. UCMP locality 5705, approximately 3 miles southwest of the desalination treatment facility site, on the south side of SR 4, yielded fossil specimens from a Rancholabrean-age ground sloth. Additional recorded vertebrate fossil sites within Pleistocene alluvium are located along both sides of I-680, both north and south of the desalination treatment facility site (UCMP V6838, V70117, V78027, V6006, and V4701). Thus, the Pleistocene alluvium would be considered a paleontologically sensitive rock unit, and there is potential for construction activities to disturb any paleontological resources they contain. This direct impact would be potentially significant.

Cumulative Impacts

Results of a paleontological record search at the U.C. Berkeley Museum of Paleontology indicated numerous vertebrate fossil remains in the vicinity of the Desalination Alternative project sites. Portions of the Desalination Alternative project sites are located within a rock formation that has a higher probability than others to yield paleontological resources (Pleistocene alluvium) and is considered paleontologically sensitive. Because the probability that individual projects would encounter paleontological resources depends on the specific rock formation that would be affected, which is different at every location, implementation of any of the related projects and other development within the region (see Section 4.1.3, “Cumulative Impact Analysis” and Appendix F-1, “Local Development Projects Considered in Cumulative Impact Analysis”) is not considered to result in significant adverse cumulative impacts on paleontological resources. The Desalination Alternative would not make an incremental contribution to any cumulative impact on paleontological resources.

Mitigation Measures

Mitigation Measure 4.17-a (Alternative 4): Conduct Construction Worker Personnel Education and Perform Construction Monitoring.

Excavation and grading of the Desalination Alternative project sites (specifically for the desalination treatment facility and the concentrate disposal pipeline) could result in damage

to unknown fossil sites. To ensure that construction activities do not directly or indirectly damage fossil resources, the following paleontological resource protection measures shall be implemented by CCWD and/or its construction contractor:

- Before initiating construction activities related to pipelines and buildings, construction personnel involved with earth-moving activities shall be informed of the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction activities, and proper notification procedures should fossils be encountered. This worker training shall be prepared and presented by a qualified paleontologist or archeologist.

- Before initiating construction activities, a qualified paleontologist shall be retained to design and implement a paleontological resource mitigation program during project-related earth-moving activities, which shall include a requirement for notification of the Contra Costa County Planning Division in the event that paleontological resources are discovered. The mitigation plan may include a field survey, emergency discovery procedures (including the requirement that all construction shall stop within a 100-foot radius of the find), sampling and data recovery procedures, arrangements for museum storage coordination for any specimen recovered, and a report of findings. The paleontologist (or qualified archaeologist) shall monitor earth-moving construction activities at the desalination treatment facility site and along the concentrate disposal pipeline alignment, with the exception of areas underlain by artificial fill or in areas where exposed sediment will be buried but not otherwise disturbed.

Implementation of this mitigation would reduce potentially significant impacts associated with paleontological resources to a less-than-significant level.

4.18 Socioeconomic Effects

This section addresses potential local socioeconomic effects from implementation of the Proposed Action or project alternatives. This section focuses on potential long-term effects on agricultural productivity and related regional employment, income, and fiscal impacts. Although Alternative 2, the Indirect Pipeline Alternative, could affect some seasonal farmworker housing on Victoria Island, any such housing would be relocated locally as necessary and none of the project alternatives would displace residents; therefore, no significant adverse population and/or housing effects would occur.

4.18.1 Affected Environment

4.18.1.1 Regulatory Setting

There are no laws, regulations, or specific local policies applicable to socioeconomics.

4.18.1.2 Environmental Setting

The environmental setting addresses existing socioeconomic conditions in San Joaquin and Contra Costa Counties from a regional (county) perspective. Under the Proposed Action and project alternatives (with the exception of the Desalination Alternative), the potential impacts on farmland would occur primarily in San Joaquin County, where the new intake and pipeline would be located on Victoria Island. Physical impacts in Contra Costa County would be minimal. Therefore, the focus of this analysis is on agricultural activity in San Joaquin County.

San Joaquin County

Based on its geographic location in the Central Valley and proximity to the San Francisco-Oakland Bay Area (to the west) and Sacramento region (to the north), San Joaquin County is characterized by a mix of rural/agricultural and urban land uses. The current (2005) population in San Joaquin County is approximately 653,500 people, an increase of 2.7% from the previous year (Department of Finance 2005). San Joaquin County's economy is supported primarily by the *Trade, Transportation, and Utilities* sector, which accounted for 21.1% of total industry employment (210,000 jobs) in the County in 2002 (Economic Development Department 2003a). Other significant economic sectors in the County include *Government* (19.1%), *Education and Health Services* (11.1%), and *Manufacturing* (10.0%). Agricultural employment accounted for 16,000 jobs in 2002 (or 7.6% of the county job base), a decrease of 6.4% from 1998. Per-capita personal income in San Joaquin County in 2003 was $24,397, and total farm labor and proprietor's income was roughly $320.7 million (Bureau of Economic Analysis 2003a, 2003b).

The approved 2004–05 San Joaquin County budget is $974.2 million (San Joaquin County 2005). Of that total, property and other taxes account for approximately $96.0 million (9.9%) and $34.1 million (3.5%) of available revenue sources, respectively. The

assessed value of properties subject to property taxes in the County totaled $42.8 billion in 2004–05, which is assessed at the current base property tax rate in the County (and across California) of 1% (Board of Equalization 2005). (Note: additional assessments may be made for special districts, bond financing, etc., depending on location.) Taxable sales in San Joaquin County totaled nearly $8.2 billion in 2003–04, with the County receiving approximately $13.7 million in sales/use tax revenue during that timeframe (Board of Equalization 2005).

San Joaquin County is a leading producer of agricultural commodities in California. In 2003, the gross value of agricultural production (without timber) in San Joaquin County totaled $1.49 billion, an increase of 10.4% relative to 2002, and ranking it sixth among California counties (California Agricultural Statistics Service [CASS] 2004a). The ten leading agricultural products, by gross value, produced in San Joaquin County in 2003 were (in descending order): milk ($256.6 million), grapes ($175.2 million), almonds ($126.0 million), tomatoes ($118 million), cherries ($109.9 million), walnuts ($96.4 million), nursery-woody ornamentals ($59.6 million), apples ($53.6 million), eggs ($51.6 million), and hay ($50.5 million) (CASS 2004a). In 2003, San Joaquin County was the State's largest producer of a number of agricultural products, including walnuts, cherries, apples, asparagus, corn grain, and cucumbers. The total value of asparagus grown in San Joaquin County in 2003 was $42.6 million (CASS 2004a).

Contra Costa County

Contra Costa County has been a rapidly urbanizing region, and is one of the nine counties that comprise the San Francisco-Oakland Bay Area. It is the ninth most populous county in California with a current (2005) population of 1,020,900 people (Department of Finance 2005). The economy of Contra Costa County, including the Cities of Pittsburg and Concord, is closely integrated with Alameda County to the south, and together these counties make up the Oakland Metropolitan Statistical Area (MSA). The total industry employment in the Oakland MSA in 2002 was 1,045,700 jobs (Economic Development Department 2003b). Similar to San Joaquin County, the largest economic sector in the Oakland MSA is *Trade, Transportation, and Utilities* (19.5%), followed by *Government (*17.7%), and *Professional and Business Services* (14.5%). Agriculture represents a relatively smaller economic activity in this region, providing less than 0.3% of the jobs in the Oakland MSA. In Contra Costa County, alone, the per-capita income level in 2003 was $43,957, and total farm labor and proprietor's income was approximately $60.0 million (Bureau of Economic Analysis 2003c, 2003d).

4.18.2 Environmental Consequences

4.18.2.1 Methods and Assumptions

This analysis is based on information on regional socioeconomic conditions and agricultural production in the project area obtained from a number of data sources including, but not limited to: the California Economic Development Department, California Department of Finance, San Joaquin Agricultural Commissioner, California Agricultural Statistics Service, and the 2000 U.S. Census. Project impacts are discussed qualitatively and focus on potential changes in agricultural production associated with

implementation of the Proposed Action or alternatives and associated changes in economic and fiscal conditions, primarily in San Joaquin County. Local agricultural production and values can be highly variable on a site-specific basis, annually, and over the long-term. Consequently, it would be speculative to estimate specific local agricultural production and values; the focus of this analysis was on regional effects.

4.18.2.2 Significance Criteria

CEQA and NEPA recognize economic or social effects as significant environmental impacts when they indirectly result in significant physical changes to the environment. For purposes of this analysis, an alternative was determined to result in a significant socioeconomic effect if it would:

- result in a loss of agricultural production and value that would have a substantial adverse economic effect in the local or regional area in which the facilities are located such that substantial quantities of agricultural land would be taken out of production in addition to those directly affected by the project.

4.18.2.3 No-Action Alternative

Under the No-Action Alternative, no new facilities would be constructed, and no agricultural lands would be temporarily or permanently removed from production or experience production decreases as a result of facility siting. Agricultural operations in the project area would continue similar to current conditions. Therefore, the ongoing economic and fiscal benefits of agricultural production in the project area would be expected to continue at existing levels. Specifically, agricultural employment, income, and property and sales tax revenues associated with project lands would not be affected. No adverse socioeconomic effects would occur either locally or regionally. Further, the No-Action Alternative would not contribute to any cumulative socioeconomic impacts.

4.18.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

Direct and Indirect Impacts

IMPACT 4.18-a (Alternative 1)

Potential Permanent Decrease in Local Economic Activity and Fiscal Revenues. *Implementation of the Proposed Action would permanently convert approximately 6–8 acres of active farmland to nonagricultural use, resulting in a permanent loss of agricultural commodity values and a related decrease in agricultural employment, income, and tax revenue associated with agricultural production. Because the amount of converted farmland and lost revenue would be small, the economic and fiscal effects would be minor, and the socioeconomic impact on a local and regional scale would be* ***less than significant****.*

Generally, agricultural production generates a range of economic and fiscal benefits related to the value of commodities that are produced. First, there are direct employment and income benefits for farm proprietors and their employees. Farm proprietors are self-employed and receive income directly from commodity sales. They also employ and pay wages to farm employees as part of their operating expenses. Second, agricultural production generates tax revenue for local jurisdictions and the Federal/State government in the form of property taxes on agricultural land, sales taxes on the cost of production

inputs (e.g., fertilizers, equipment, etc.), and income taxes paid on agricultural income. Further, agricultural production indirectly generates additional economic and fiscal benefits as the money spent on agricultural inputs and wages spent by farm proprietors/employees circulates through the local economy; this process is commonly referred to as the "multiplier effect."[1]

It is estimated that the Proposed Action would permanently remove approximately 6–8 acres of active farmland from agricultural production in San Joaquin County (see Section 4.8, "Agriculture," for calculations of agricultural land conversion and a description of Prime Farmland and Farmland of Statewide Importance affected by the project). The Proposed Action would be designed, however, to limit the acreages of active farmland that would be permanently removed, and agricultural and socioeconomic effects were considered in siting project features and during preliminary project design. As outlined in Section 4.8, "Agriculture," the pipeline would be designed in a manner to allow agricultural practices to continue on Victoria Island with only temporary interruption of certain fields during project construction.

While it could be assumed that the specific agricultural commodities grown on the proposed project site (i.e., asparagus, alfalfa, and wheat) in the absence of the Proposed Action could remain the same as existing conditions, this is somewhat speculative because crop patterns can change substantially over time. Moreover, specific crop values can vary significantly on an annual or longer basis. It can be reasonably concluded, however, that implementation of the Proposed Action would result in only a very minor loss of agricultural production in San Joaquin County that would have virtually no effect on regional crop values. This relatively minor effect would not be expected to lead to additional loss of agricultural land elsewhere due to socioeconomic impacts.

Assuming that the value of agricultural commodities primarily represents production costs, which includes taxable goods/equipment and wages, and a profit margin for the farm proprietor, the loss in crop value annually would potentially decrease agricultural employment and income/wages (unless other employment opportunities exist in the region), taxable sales, and related tax revenues. The extent of farm proprietor income lost would be directly related to current commodity prices and operating expenses, which fluctuate annually. When evaluated in the context of the agricultural-based income and employment totals in San Joaquin County, it is estimated that the loss of agricultural production attributed to the Proposed Action would result in a negligible loss in personal income and jobs in San Joaquin County. In fact, it is quite possible that there would be no permanent loss in personal income and jobs in San Joaquin County whatsoever from implementing the Proposed Action.

[1] The multiplier effect refers to the indirect and induced economic benefits that result from money circulating throughout the economy. Indirect economic effects refer to changes in employment and income resulting from the iterations of industries purchasing from other industries that are caused by the direct final demand changes. Induced economic effects refer to changes in employment and income in all local industries caused by the expenditures of new household income generated by the direct and indirect economic effects.

Overall, the loss of agricultural acreage attributed to the Proposed Action would be minor in comparison with the more than half-million acres of active cropland in San Joaquin County and in comparison with Delta farming in general. Based on the relatively small proportion of affected agriculture lands, the Proposed Action is not expected to result in any substantial displacement of agricultural workers, and any associated loss in employment income and tax revenues would be negligible. Therefore, this impact would be less than significant.

IMPACT 4.18-b (Alternative 1)

Temporary Economic and Fiscal Impact. *Construction of the Proposed Action could disrupt agricultural operations on land surrounding the construction area, resulting in a temporary loss of economic and fiscal benefits associated with agricultural production. Because the potential loss of these benefits would be very small and would be temporary, construction-related effects on socioeconomic resources would be* ***less than significant****.*

In addition to the permanent socioeconomic effects described in Impact 4.18-a (Alternative 1) above, construction activities associated with the proposed construction activities would temporarily affect additional areas of agricultural land over a 36-month construction period. The temporary staging areas for construction parking, access roads, and the temporary stockpiling of excavated soils and storage of construction equipment and materials would temporarily occupy approximately 35–50 acres of land on Victoria Island and up to 1 acre of land on Byron Tract. An additional corridor, approximately 200 feet wide along the entire length of the pipeline, would also be needed for temporary construction access during pipeline installation; the area of this pipeline corridor would total approximately 160–285 acres. (Although the pipeline corridor would diagonally cross agricultural land in active use, the presence of the buried pipeline would not preclude farming over the pipeline alignment; therefore, this is considered a temporary impact.) In addition to the temporary direct disturbance of land, construction of the proposed facilities could limit access to, and disrupt cultivation of, some adjacent fields. In total, it is conservatively estimated that during construction of the Proposed Action, agricultural production may be temporarily suspended on approximately 200–470 acres on Victoria Island during the pipeline construction period.

Based on these parameters, the temporary direct loss in agricultural values would represent a small percentage of the County's total crop value. These relative values, and the corresponding effects on agricultural income, employment, and tax revenues, would be similar in nature to the effects described above under Impact 4.18-a (Alternative 1), and are considered minor. Further, because these disturbances would be temporary and the affected land could be returned to agricultural use after construction has ended, this impact is considered less than significant.

Cumulative Impacts

Implementation of the Proposed Action concurrently with other projects within the same geographic context (see Section 4.1.3, "Cumulative Impact Analysis" and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis") could convert farmland to nonagricultural use and reduce income from agricultural production. However, future projects, such as commercial development, would provide new

employment opportunities, replace income lost in the agricultural sector with income from other sectors of the economy, and provide new sources of sales, income, and property tax revenue. It would be speculative to attempt to determine the significance of cumulative economic and fiscal impacts. Given the minor socioeconomic effect of the Proposed Action, it can be concluded that the Proposed Action would not make a considerable contribution to any significant cumulative socioeconomic impact.

Mitigation Measures

No mitigation measures are required.

4.18.2.5 Alternative 2, Indirect Pipeline Alternative

Direct and Indirect Impacts

Under Alternative 2, the types of economic and fiscal impacts of the project would be similar to those described for the Proposed Action except that the amount of agricultural land temporarily affected by the alternative pipeline alignment during construction (and subject to purchase or right-of-way acquisition) would be less.

It is estimated that under this alternative, a total of approximately 6–8 acres of agricultural land could be permanently removed from production. Therefore, the long-term, permanent economic effects of Alternative 2 (in terms of a loss in crop production) would be the same as the Proposed Action, which would also permanently convert approximately 6–8 acres of agricultural land to non-agricultural use. As with the Proposed Action, the pipeline would be designed in a manner to allow agricultural practices to continue on Victoria Island with only temporary interruption of certain fields during project construction.

Temporary crop production effects would be less than those under the Proposed Action. Alternative 2 would result in approximately 155–305 acres of agricultural lands temporarily affected during construction, while the Proposed Action would result in temporary effects to approximately 200–470 acres of agricultural lands. Because much of the estimated acreage subject to potential disruption during construction is currently used for access roads and/or is bordered by existing drainage ditches on the perimeter of existing fields, the net effect of Alternative 2 is a reduction in the acreage subject to temporary disruption of farming operation, as compared to the Proposed Action. These effects would continue to account for only a minor portion of the total economic and fiscal benefits generated by the County's agricultural sector.

Further, similar to the Proposed Action, it is not expected that the effect on short- and long-term agricultural production would result in the substantial displacement of agricultural workers, and any associated loss in employment income would be considered negligible. Overall, economic and fiscal impacts are considered less than significant under Alternative 2.

As described for the Proposed Action, Alternative 2 would not make a considerable contribution to any significant cumulative socioeconomic impact.

4.18.2.6 Alternative 3, Modified Operations Alternative

The direct, indirect, and cumulative impacts of Alternative 3 would be identical to those described for the Proposed Action. All socioeconomic impacts would be less than significant.

4.18.2.7 Alternative 4, Desalination Alternative

Development of the Desalination Alternative would consist of facilities within urban and open space lands that do not contain agricultural lands. Therefore, there would be no change in agricultural production and no impacts on agricultural operations, income, employment, or related tax revenues would occur. The Desalination Alternative would directly add approximately 10 jobs to the local economy. The economic and fiscal consequences of this alternative would be small both locally and regionally. Further, the Desalination Alternative would not contribute to any cumulative socioeconomic impact.

4.19 Environmental Justice

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low Income Populations (1994), includes the following agency responsibilities in regard to addressing environmental justice in minority and low-income populations:

> To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands. [Section 1-101]

This section addresses environmental justice issues for the Proposed Action and alternatives. Socioeconomic effects of the project are discussed in Section 4.18, "Socioeconomic Effects," and the project's potential for growth-inducement is discussed in Section 4.20, "Growth-Inducing Effects."

4.19.1 Affected Environment

4.19.1.1 Regulatory Setting

Federal

Executive Order 12898
The purpose of EO 12898 is to identify and address the disproportionate placement of adverse environmental, economic, social, or health impacts from Federal actions and policies on minority and/or low-income communities. This order requires that impacts on minority or low-income populations be taken into account during preparation of environmental and socioeconomic analyses of projects or programs that are proposed, funded, or licensed by Federal agencies.

In addition to the direction referenced above, EO 12898 requires the following:

- Each Federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to

discrimination under, such programs, policies, and activities, because of their race, color, or national origin. [Section 2-2]

- Each Federal agency shall work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public. [Section 5-5(c)]

In addition, the presidential memorandum accompanying the EO states that "(e)ach Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA of 1969."

Two documents provide some measure of guidance to agencies required to implement the EO. The first is the *Environmental Justice Guidance Under the National Policy Act*, published by the Council on Environmental Quality (CEQ). The second document, the *Final Guidance for Incorporating Environmental Justice Concerns* published in the U.S. Environmental Protection Agency's (EPA's) NEPA Compliance Analysis, serves as a guide for incorporating environmental justice goals into preparation of environmental impact statements under NEPA. These documents provide specific guidelines for determining whether there are any environmental justice issues associated with a proposed Federal project.

State

There are no State plans, policies, regulations, or laws related to environmental justice that are applicable to the Proposed Action or alternatives.

4.19.1.2 Environmental Setting

For purposes of an environmental justice screening, race, ethnic origin, and poverty status were obtained for San Joaquin and Contra Costa Counties and the Cities of Concord and Pittsburg. Most of the data collected is based on the 2000 U.S. Census, which, for purposes of this analysis, is considered "existing conditions." In the following discussions, the term "minority" is used to represent all non-Caucasian ethnic groups.

San Joaquin County

The population of San Joaquin County in 2000 was 563,598 residents, living mostly in urbanized areas. Approximately 244,000 people (43% of the county population) live in Stockton and approximately 190,000 people (34% of the county population) live in Tracy, Manteca, Ripon, Lodi, Lathrop, and Escalon. The remaining 23% of San Joaquin County's population lives in the more sparsely occupied unincorporated areas (U.S. Census 2000).

Table 4.19-1 shows San Joaquin County's population distribution by racial and ethnic groups, as identified in the 2000 census. As shown, 58.1% of the county's residents identify themselves as Caucasian, lower than the statewide average of 59.5%. The percentage of San Joaquin County residents identifying themselves as being of Hispanic origin (30.5%) is slightly lower than the statewide average (32.4%) (U.S. Census 2000).

Table 4.19-1 San Joaquin County Population Distribution by Race and Ethnicity (2000 data)		
Race/Ethnicity	**Number of Individuals**	**Percentage**
Caucasian	327,607	58.1
Black	37,689	6.7
American Indian/Eskimo/Aleut	6,377	1.1
Asian or Pacific Islander	66,238	11.7
Multiple Races or Other Race	125,687	22.3
Hispanic Origin	172,073	30.5
Source: U.S. Census Bureau 2000 Note: Percentage values do not equal 100% of the County's population due to multi-race reporting.		

The 2000 U.S. Census data show that the 1999 per capita income in the county was $17,365, with about 17.7% of individuals in 1999 earning below the poverty level (California Employment Development Department 2005).

Contra Costa County

The population of Contra Costa County in 2000 was about 949,000. Approximately 13% of the population (about 122,000 people) live in Concord and approximately 6% (57,000 people) live in Pittsburg.

Table 4.19-2 shows Contra Costa County's population distribution by racial and ethnic groups as identified in the 2000 census. As shown, 65.5% of the county's residents identify themselves as Caucasian, significantly higher than the statewide average of 59.5%. The percentage of Contra Costa County residents identifying themselves as being of Hispanic origin (17.7%) is considerably lower than the statewide average (32.4%) (U.S. Census 2000).

Table 4.19-2 Contra Costa County Population Distribution by Race and Ethnicity (2000 data)		
Race/Ethnicity	**Number of Individuals**	**Percentage**
Caucasian	621,490	65.5
Black	88,813	9.4
American Indian/Eskimo/Aleut	5,830	0.6
Asian or Pacific Islander	107,459	11.3
Multiple Races or Other Race	125,224	13.2
Hispanic Origin	167,776	17.7
Source: U.S. Census Bureau 2000 Note: Percentage values do not equal 100% of the County's population due to multi-race reporting.		

Tables 4.19-3 and 4.19-4 show population distribution by racial and ethnic groups for the Cities of Concord and Pittsburg, respectively. Concord has a lower percentage of minority (non-Caucasian) populations than Contra Costa County as a whole (see

Table 4.19-2), while Pittsburg has a higher percentage of minority (non-Caucasian) populations.

Table 4.19-3
City of Concord Population Distribution by Race and Ethnicity (2000 data)

Race/Ethnicity	Number of Individuals	Percentage
Caucasian	86,114	70.7
Black	3,706	3.0
American Indian/Eskimo/Aleut	929	0.8
Asian or Pacific Islander	12,050	9.9
Multiple Races or Other Race	18,981	15.6
Hispanic Origin	26,560	21.8

Source: U.S. Census Bureau 2000
Note: Percentage values do not equal 100% of the County's population due to multi-race reporting.

Table 4.19-4
City of Pittsburg Population Distribution by Race and Ethnicity (2000 data)

Race/Ethnicity	Number of Individuals	Percentage
Caucasian	24,712	43.5
Black	10,724	18.9
American Indian/Eskimo/Aleut	423	0.7
Asian or Pacific Islander	7,670	13.5
Multiple Races or Other Race	13,240	23.3
Hispanic Origin	18,287	32.2

Source: U.S. Census Bureau 2000
Note: Percentage values do not equal 100% of the County's population due to multi-race reporting.

The 1999 per capita income reported for Contra Costa County was $30,615, with about 9.7% of individuals in 1999 earning below the poverty level (California Employment Development Department 2005). For Concord, the 1999 per capita income was $24,727, with 9.3% below the poverty line. The per capita income reported for Pittsburg was $18,241, with 17.2% below the poverty level (U.S. Census 2000).

Victoria Island /Byron Tract

Population Density
Census data were not collected for the Victoria Island/Byron Tract project site because of its existing land use type. As described in Section 4.7, "Land Use," and Section 4.8, "Agriculture," Victoria Island consists entirely of agricultural uses. No permanent residences are located on the island south of SR 4, and the population density on the island and adjoining agricultural fields is less than 1,000 residents per square mile (U.S. Census 2000). Two small, temporary (seasonal) farm worker housing units are located

south of SR 4 and house temporary farm workers, who are likely of non-Caucasian (minority) ethnic status and have income below the poverty level.

Byron Tract is similar to Victoria Island in that it consists entirely of and is surrounded by agricultural uses. The property also includes public/semi-public uses at the proposed project site (i.e., the CCWD Old River intake and pump station). No temporary (seasonal) or permanent residences exist within or adjacent to the proposed project site on Byron Tract. Population density is also less than 1,000 residents per square mile in the area (U.S. Census 2000). As there is no population at the Byron Tract proposed project site, racial distribution and income level are not relevant.

Desalination Alternative Project Sites

The Desalination Alternative project sites are located within Contra Costa County. Some of these sites are located within the spheres of influence for the Cities of Pittsburg and Concord (see Section 4.7, "Land Use," for a discussion of the spheres of influence of these cities).

Population Density

The new intake and pump station at Mallard Slough would be located within a census block in an open space area with a population density of zero. Approximately 0.25 mile west of the site, the census block has a population density less than 1,000 persons per square mile. The Bollman Water Treatment Plant (WTP) is located in a business/industrial area, and the new concentrate disposal pipeline would pass through uninhabited marshland.

More than half (approximately 57%) of the new untreated-water conveyance pipeline alignment would be in census blocks with population densities of zero (Claritas 2004). These areas are near the Mallard Slough intake and pump station, along part of the Contra Costa Canal, and the western portion of the alignment is along the Mokelumne Aqueduct. The remainder of the alignment (approximately 43%) would pass through census blocks with population densities of 1,000 persons per square mile or greater (Claritas 2004). These areas are concentrated in the communities of Bay Point and Clyde.

Racial Distribution

Of the portion of the new untreated-water pipeline alignment where population density exceeds zero, about 74% would cross census blocks with a minority population of 25%–50%; these are primarily in Bay Point (Claritas 2004). Approximately 23% would cross census blocks with 50%– 75% minority populations; these are in Bay Point and Clyde. Less than 3% of the alignment along Siino West Avenue in Bay Point (see Exhibit 3.7-4 in Chapter 3, "Alternatives, Including the Proposed Action") is located in a census block with a minority population range of 75–100% (Claritas 2004).

Income Level

Of the portion of the new untreated-water pipeline alignment where population density exceeds zero, about 63% is in census blocks in which 17–27% of the population is below the poverty level; these blocks are all in Bay Point. Another 14% of the alignment, also in Bay Point, would cross census block groups where 9–17% of the population is below poverty level. The remainder (within Clyde and along the westernmost portion of the

alignment near Mallard Reservoir) would be in areas where the population below poverty is 0–9% (Claritas 2004).

4.19.2 Environmental Consequences

4.19.2.1 Methods and Assumptions

According to CEQ and EPA guidelines established to assist Federal and State agencies, the first step in conducting an environmental justice analysis is to define minority and low-income populations. Based on these guidelines, a minority population is present in a project area if: (1) the minority population of the affected area exceeds 50%, or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. By the same rule, a low-income population exists if the project area consists of 50% or more people living below the poverty threshold, as defined by the U.S. Census Bureau, or is significantly greater than the poverty percentage of the general population or other appropriate unit of geographic analysis. The second step of an environmental justice analysis requires a finding of a high and adverse impact. The CEQ guidance indicates that when determining whether the effects are high and adverse, agencies are to consider whether the risks or rates of impact "are significant (as employed by NEPA) or above generally accepted norms." The final step requires a finding that the impact on the minority or low-income population be disproportionately high and adverse. While none of the published guidelines define the term "disproportionately high and adverse," the CEQ includes a non-quantitative definition stating that an effect is disproportionate if it appreciably exceeds the risk or rate to the general population.

The following population characteristics are considered in this analysis:

- race and ethnicity as described in the 2000 census; and
- per capita income as it relates to the poverty level.

The relevant data were obtained from the U.S. Census and California Department of Finance. U.S. Census data are presented at the census block group level.

In this analysis, a census block with a non-Caucasian population over 50% is considered to have a minority population. Low-income areas are defined as census block groups in which the percentage of the population below poverty status exceeds the average poverty level of each jurisdiction (9.7% for Contra Costa County, 9.3% for Concord, and 17.2% for Pittsburg). A densely populated census block is one in which there are more than 1,000 residents per square mile.

Any adverse human health and environmental effects of the Proposed Action and alternatives on a community, including a minority or low-income population, would occur in association with construction activities, as project operations would have no substantial adverse environmental effects. Therefore, the discussions below focus on populations that could be affected by construction activities.

4.19.2.2 Impact Evaluation Criteria

To make a finding that disproportionately high and adverse effects would likely fall on the minority or low-income population, three conditions must be met simultaneously: (1) there must be a minority or low-income population in the impact zone; (2) a high and adverse impact must exist; and (3) the impact must be disproportionately high and adverse on the minority or low-income population.

4.19.2.3 No-Action Alternative

Under the No-Action Alternative, no physical changes to the environment would occur. The proposed facilities would not be constructed, and existing CCWD facilities would continue to be operated as under current conditions. Because no physical activities would occur, there would be no potential for harm or disturbance to minority and low-income communities. The No-Action Alternative would have no direct or indirect effect on environmental justice and would not contribute to any cumulative impact.

4.19.2.4 Alternative 1, Direct Pipeline Alternative (Proposed Action)

The proposed project site consists of actively farmed agricultural lands and CCWD's existing Old River intake and pump facility. No permanent residences are located on the island south of SR 4; the nearest permanent residences are located approximately 0.5 mile northwest of the Byron Tract portion of the project site in Discovery Bay, which is not considered a low-income or minority community. There are no minority or low-income communities in the vicinity of the proposed project site. Two small, temporary (seasonal) farm worker housing units are located south of SR 4 and house temporary farm workers, who are likely of non-Caucasian (minority) ethnic status and have income below poverty level. The Proposed Action would not displace these housing units.

The Proposed Action, therefore, would not cause a disproportionately high and adverse impact on minority or low-income populations or contribute to any cumulative disproportionately high and adverse impact on such populations. No adverse impact would occur.

Improved water quality offered by the Proposed Action would have a potential benefit for CCWD's lower income customers, because these customers are often more affected by high salinity in water, due to the high costs of replacing water heaters, using bottled water, and other measures to address high salinity levels in potable water.

4.19.2.5 Alternative 2, Indirect Pipeline Alternative

Although Alternative 2 could affect the seasonal farm employee housing on Victoria Island (located immediately adjacent to the indirect pipeline route), any such housing would be avoided or relocated as necessary. No residents would be displaced. As described for the Proposed Action, Alternative 2 would not cause a disproportionately high and adverse impact on minority or low-income populations or contribute to any cumulative disproportionately high and adverse impact on such populations. No impact would occur.

4.19.2.6 Alternative 3, Modified Operations Alternative

The construction impacts of Alternative 3 would be identical to those of the Proposed Action. As described for the Proposed Action, Alternative 3 would not cause a disproportionately high and adverse impact on minority or low-income populations or contribute to any cumulative disproportionately high and adverse impact on such populations. No impact would occur.

4.19.2.7 Alternative 4, Desalination Alternative

Direct and Indirect Impacts

IMPACT 4.19-a (Alternative 4)

***Potential Disproportionate Effects on Minority and Low-Income Populations**. In the areas of dense population along the untreated-water conveyance alignment, a majority of the construction activity would occur in low-income residential areas. However, the construction activity in any specific area would be short term and would not constitute a disproportionately high and adverse impact on the population of these areas. This impact would therefore be **less than significant**.*

The new untreated-water conveyance pipeline would be installed through densely populated census blocks of Bay Point and Clyde. Construction methods and effects of construction would be similar along the entire alignment in these areas. Within the densely populated census blocks, approximately 23% of the pipeline alignment would pass through census blocks with a minority population (i.e., where more than 50% of the population is minority), and 77% would pass through blocks that do not meet the definition for minority population. Adverse construction effects, therefore, would not disproportionately affect a minority population. However, approximately 63% of the construction activity would be in census blocks where the percentage of the population below poverty is greater than 9.7%, the threshold for the average poverty level in Contra Costa County. (The Contra Costa County threshold is used rather than the higher threshold of 17.2% for Pittsburg to provide a more conservative evaluation).

Although more construction activity with potential to adversely affect individuals would occur among a low-income population, the activity is not expected to result in a high and adverse impact because of their short-term nature. Residences near the construction activity would be subject to construction-related effects, including increased noise, dust, and traffic disruptions. However, the impacts in any particular location (e.g., on a particular residential block) would be short term (possibly lasting a few weeks in any one location), and construction would take place when most residents are not expected to be at home. Therefore, it is concluded that these construction activities would not constitute a disproportionately high and adverse impact on a low-income population, either directly or cumulatively. This impact is therefore less than significant.

Cumulative Impacts

As described above, some of the Desalination Alternative project facilities would be located in areas of dense population (along the untreated-water conveyance alignment) and a majority of the construction activity would occur in low-income residential areas. However, the construction activity in any specific area would be short term and would not constitute a high and adverse impact on the population of these areas. There are no

other known projects anticipated in the vicinity of the Desalination Alternative project sites that would result in disproportionate effects on minority and low-income populations (see Section 4.1.3, "Cumulative Impact Analysis" and Appendix F-1, "Local Development Projects Considered in Cumulative Impact Analysis"). Therefore, the Desalination Alternative would not contribute to cumulative impacts related to environmental justice issues.

Mitigation Measures

No mitigation is required.

4.20 Growth-Inducing Effects

This section defines growth-inducing impacts and evaluates the potential for the Proposed Action and alternatives to directly or indirectly induce growth.

The format of this section differs from other resource sections in this EIR/EIS because there are no specific thresholds from which to measure potential impacts. Rather, the significance is in how growth could lead to physical environmental impacts in the various resource areas (e.g., reduced air quality, increased traffic, demand for public services, changes in land uses, etc.). Growth in itself does not have physical environmental impacts and is thus not treated as an environmental resource.

4.20.1 Affected Environment

4.20.1.1 Regulatory Setting

State

The State CEQA Guidelines (§15126[d]) require that an EIR evaluate the growth-inducing impacts of a proposed action. Growth-inducing impacts are described in §15126.2(d) as follows:

> [T]he ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth…. Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects…. [In addition,] the characteristics of some projects…may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Included in this definition are public works projects that would remove obstacles to population growth. Direct growth inducement would result if a project, for example, involved the construction of new housing. Indirect growth inducement would result if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises), involved a construction effort with substantial short-term employment opportunities that would indirectly stimulate the need for additional housing and services, or removed an obstacle to housing development.

Growth inducement may lead to adverse environmental impacts if the induced growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected and thus would lead to adverse physical effects

that might not occur otherwise. Local land use plans provide for land use development patterns and growth policies that encourage orderly urban development supported by adequate urban public services such as water supply, roadway infrastructure, sewer services, and solid waste services. A project that would induce "disorderly" growth (i.e., growth that would conflict with the local land use plans) could indirectly cause additional adverse environmental impacts and other public services impacts.

Local

San Joaquin and Contra Costa Counties have land use jurisdiction over development in the vicinity of the proposed project site (i.e., Victoria Island and Byron Tract), and Contra Costa County has jurisdiction over development in the vicinity of the Desalination Alternative project sites. The new facilities associated with the Desalination Alternative would also be located within the spheres of influence of the Cities of Concord and Pittsburg. The growth management policies of these agencies are summarized below.

San Joaquin County

The *San Joaquin County General Plan* (adopted July 29, 1992 and amended July 2002) contains objectives, policies, and implementation measures that provide for future growth in a manner that preserves the natural and rural assets of the county and fosters coordination with the cities. The county's growth accommodation objective is to ensure that there is an adequate amount of land planned for urban development to accommodate the projected population growth in areas where the appropriate levels of service are or can be made available.

Contra Costa County

The Growth Management Element of the *Contra Costa County General Plan 2005–2020* (January 2005) establishes a long-range program that will match the demand for public facilities to serve new development with plans, capital improvement programs, and development impact mitigation programs. The Growth Management Element establishes traffic level of service standards and complies with the Contra Costa Transportation Improvement and Growth Management Program (Measure C), approved by voters in 1988. The element also sets performance standards for fire, police, parks, sanitary facilities, water service, and flood control, and is closely tied to other General Plan elements, including Land Use, Transportation and Circulation, Public Facilities/Services, and Conservation.

City of Concord

The *City of Concord General Plan* (adopted by City Council July 26, 1994 and amended in April 1, 2003) includes a Growth Management Element that balances the demands for public facilities generated by new development with plans, capital improvement programs, and development mitigation programs. The Growth Management Element establishes traffic level of service standards and is consistent with the requirements of the Contra Costa Transportation Improvement and Growth Management Program (Measure C), approved by voters in 1988. The element also sets performance standards for parks, fire, police, sanitary facilities, water service, and flood control.

City of Pittsburg
The Growth Management Element of the *City of Pittsburg General Plan* (amended through December 2004) provides a framework to ensure balance between new urban development and public facilities. The Growth Management Element establishes traffic level of service standards, in accordance with the Contra Costa Transportation Improvement and Growth Management Program (Measure C), approved by voters in 1988. This element also sets performance standards for other public services and facilities, including police, fire, parks, and utilities.

4.20.1.2 Environmental Setting

Population projections for San Joaquin County are not provided below, as neither the Proposed Action nor the alternatives would result in direct or indirect growth in San Joaquin County, which is not in CCWD's service area.

Regional Population Growth Projections

The Association of Bay Area Governments (ABAG) prepares and periodically updates population and employment forecasts for the San Francisco Bay Area, including Contra Costa and San Joaquin Counties. Public agencies use the ABAG forecasts to assist in planning for adequate transportation and other infrastructure (including water and wastewater services), as well as air quality management. ABAG relies on data from the national census, State Department of Finance, and planning agencies in preparing population and employment forecasts for the counties and the incorporated cities within each county.

As shown in Table 4.20-1, the population within CCWD service area is anticipated to increase from approximately 468,400 (in 2005) to approximately 553,300 (in 2020), an 18% increase. Also shown for comparison are the population forecasts for all of Contra Costa County.

Table 4.20-1
Population Projections for Contra Costa County and CCWD Service Area

Year	Contra Costa County	CCWD Service Area[1]
2000	948,816	431,700
2005	1,013,200	468,400
2010	1,071,700	507,100
2015	1,129,300	530,200
2020	1,185,200	553,300

Source: ABAG 2003; CCWD 1998
[1] Note: The population projections for the CCWD Service Area do not include all of Brentwood.

4.20.2 Environmental Consequences

To assess the growth-inducement potential of the Proposed Action and alternatives, it must be determined whether construction and/or operation would directly or indirectly support economic or population growth or residential construction. The No-Action Alternative would have no effect on either the physical or economic environment. Therefore, the No-Action Alternative is not discussed further in this section.

Because the Proposed Action and alternatives would not involve the construction of new housing, they would not be directly growth inducing.

Construction activities would generate short-term employment opportunities that would have the potential to indirectly stimulate the need for additional housing and services during the construction period, which would last approximately 36 months. The construction labor force is estimated to average about 75 to 100 people over the total construction period for the Proposed Action and Alternatives 2 and 3, with peak staffing close to 125 people. The labor force for the Desalination Alternative (Alternative 4) could be as much as 150 people at times. Because of the limited number and type of new jobs that would be generated and the temporary nature of those jobs, it is anticipated that the new jobs would be filled using the existing local employment pool. Existing available housing in San Joaquin and Contra Costa Counties would easily accommodate any workers who relocate from outside the area, if needed.

Project operations and maintenance necessary for the Proposed Action and alternatives would require a minimal number of new workers. The new intake and pump station at either Victoria Canal (Proposed Action and Alternatives 2 and 3) or Mallard Slough (Alternative 4) would be unstaffed, and CCWD personnel would monitor the station via telemetry as well as through regular inspections. Up to two new workers might be hired by CCWD to assist in the maintenance and operation of these new facilities. Under Alternative 4, a staff of 10 or fewer would be added at the Bollman WTP site to operate the new desalination treatment facility.

A variety of factors indirectly influence business, residential, and population growth in the region (e.g., the general plans and policies of the counties and cities, the availability of utility services, public schools, and transportation services). The availability of water is one of the primary public services needed to support urban development, and a service capacity deficiency could constrain future development.

The basic project purpose is to protect and improve the quality of water delivered to CCWD's untreated- and treated-water customers. The Proposed Action and alternatives would all meet this purpose without increasing the total amount of water delivered to customers. Neither the Proposed Action nor any of the project alternatives would result in an increase in CCWD's delivered water supply or remove or reduce water supply as a constraint to growth. Therefore, the Proposed Action and alternatives would not result in indirect growth-inducement.

4.21 Summary of Impacts

4.21.1 Overview of the Environmental Effects of the Alternatives

Table 4.21-1, "Summary of the Environmental Effects of the Alternatives," summarizes the potential environmental effects of the project alternatives and the No-Action Alternative.

Table 4.21-1
Summary of the Environmental Effects of the Alternatives

Environmental Effect	No-Action	Alternative 1: Proposed Action	Alternative 2: Indirect Pipeline	Alternative 3: Modified Operations	Alternative 4: Desalination
Delta Water Resources					
Long-term changes in Delta water supplies	-	LTS	LTS	LTS	LTS
Long-term changes in Delta water quality that cause violations of Delta water quality standards	-	LTS	LTS	LTS	LTS
Long-term changes that result in substantial water quality degradation that would adversely affect beneficial uses or substantially change Delta user's operations	-	LTS	LTS	LTS	LTS
Long-term changes in Delta water levels	-	LTS	LTS	LTS	LTS
Delta Fisheries and Aquatic Resources					
Intake construction and increased sedimentation, turbidity, and contaminants	-	LTS	LTS	LTS	-
Underwater sound pressure impact from cofferdam installation	-	LTS (m)	LTS (m)	LTS (m)	-
Potential chemical spill during construction	-	LTS (m)	LTS (m)	LTS (m)	-
Potential fish and macroinvertebrate stranding during dewatering of the cofferdam	-	LTS (m)	LTS (m)	LTS (m)	-
Aquatic habitat loss at intake structure site along Victoria Canal shoreline	-	LTS	LTS	LTS	-

4.21 Summary of Impacts

Table 4.21-1
Summary of the Environmental Effects of the Alternatives

Environmental Effect	No-Action	Alternative 1: Proposed Action	Alternative 2: Indirect Pipeline	Alternative 3: Modified Operations	Alternative 4: Desalination
Hydraulic modifications to habitat in Victoria Canal and adjacent to the proposed intake	-	LTS	LTS	LTS	-
Fish losses through entrainment and impingement at CCWD intakes (direct/cumulative)	-/-	B/-	B/-	B/-	LTS (m)/ LTS (m)
Effects on Delta fisheries and aquatic habitat as indicated by changes in key hydrologic indicators	-	LTS	LTS	LTS	-
Periodic maintenance dredging and associated effects on fish	-	LTS	LTS	LTS	-
Saline discharges from the new concentrate disposal pipeline	-	-	-	-	LTS (m)
Earth Resources					
Risk of geologic hazards	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Project-related erosion hazards	-	LTS	LTS	LTS	LTS (m)
Local Hydrology and Water Quality					
Temporary degradation of surface water quality (direct/cumulative)	-/-	LTS (m)/ LTS (m)	LTS (m)/ LTS (m)	LTS (m)/ LTS (m)	LTS (m)/-
Potential contribution of new facilities to flooding	-	LTS	LTS	LTS	LTS (m)
Change in local flooding potential as a result of levee modifications	-	LTS	LTS	LTS	-
Terrestrial Biological Resources					
Potential fill of jurisdictional waters of the United States and loss of sensitive habitat	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Potential loss of special-status plants	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Effects on giant garter snake	-	LTS (m)	LTS (m)	LTS (m)	-
Effects on greater sandhill crane	-	LTS	LTS	LTS	-
Effects on Swainson's hawk, white-tailed kite, northern harrier, and other raptors	-	LTS (m)	LTS (m)	LTS (m)	-
Effects on burrowing owl	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Effects on western pond turtle	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)

Table 4.21-1
Summary of the Environmental Effects of the Alternatives

Environmental Effect	No-Action	Alternative 1: Proposed Action	Alternative 2: Indirect Pipeline	Alternative 3: Modified Operations	Alternative 4: Desalination
Effects on California horned lark and loggerhead shrike	-	LTS	LTS	LTS	-
Effects on tricolored blackbird	-	LTS (m)	LTS (m)	LTS (m)	-
Potential effects to NCCP terrestrial habitat types	-	LTS (m)	LTS (m)	LTS (m)	-
Potential cumulative effects on terrestrial special-status species and habitats	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Disturbance/removal of habitat for California clapper rail, California black rail, and salt marsh harvest mouse	-	-	-	-	LTS (m)
Effects on northern harrier, white-tailed kite, and other raptors	-	-	-	-	LTS (m)
Effects on habitat for common yellowthroat, Suisun song sparrow, and loggerhead shrike	-	-	-	-	LTS
Long-term effects of the brine discharge into Suisun Bay	-	-	-	-	LTS (m)
Land Use					
Conflicts with existing land use goals and policies	-	-	-	-	LTS
Agriculture					
Permanent conversion of Prime Farmland and Farmland of Statewide Importance (direct/cumulative)	-/-	SU/SU	SU/SU	SU/SU	-/-
Conflicts with agricultural zoning or Williamson Act Contracts	-	LTS	LTS	LTS	-
Transportation and Circulation					
Temporary and long-term traffic increase (direct/cumulative)	-/-	LTS/LTS	LTS/LTS	LTS/LTS	LTS/LTS
Temporary traffic and emergency service delays and access restrictions	-	LTS	LTS	LTS	LTS (m)
Temporary increase in traffic hazards	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Temporary disruptions to rail operations	-	-	-	-	LTS
Temporary disruptions to transit service	-	-	-	-	LTS (m)

4.21 Summary of Impacts

Table 4.21-1
Summary of the Environmental Effects of the Alternatives

Environmental Effect	No-Action	Alternative 1: Proposed Action	Alternative 2: Indirect Pipeline	Alternative 3: Modified Operations	Alternative 4: Desalination
Air Quality					
Short-term construction criteria air pollutant emissions (direct/cumulative)	-/-	SU/SU	SU/SU	SU/SU	LTS (m)/SU
Long-term operational (regional) criteria air pollutant emissions	-	LTS	LTS	LTS	LTS
Long-term operational (local) mobile-source carbon monoxide emissions	-	LTS	LTS	LTS	LTS
Exposure of sensitive receptors to toxic air contaminants	-	LTS	LTS	LTS	LTS
Exposure of sensitive receptors to odorous emissions	-	LTS	LTS	LTS	LTS
Noise					
Short-term construction noise	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Long-term increases in noise	-	LTS	LTS	LTS	LTS
Exposure of sensitive receptors to or generation of excessive ground-borne vibration or noise	-	LTS	LTS	LTS	LTS
Utilities and Service Systems					
Disruption of utility services during construction	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Increases in energy consumption	-	LTS	LTS	LTS	LTS
Increases in solid waste generation	-	LTS	LTS	LTS	LTS
Hazardous Materials					
Potential creation of a public health hazard	-	LTS	LTS	LTS	LTS
Potential hazardous materials exposure	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Potential wildfire hazard	-	LTS	LTS	LTS	LTS
Visual Resources					
Temporary visual effects	-	LTS	LTS	LTS	LTS
Long-term visual effects	-	LTS	LTS	LTS	LTS
Changes in light or glare	-	LTS	LTS	LTS	LTS
Recreation					
Temporary or long-term recreation effects	-	LTS	LTS	LTS	LTS

Table 4.21-1
Summary of the Environmental Effects of the Alternatives

Environmental Effect	No-Action	Alternative 1: Proposed Action	Alternative 2: Indirect Pipeline	Alternative 3: Modified Operations	Alternative 4: Desalination
Cultural Resources					
Damage to/destruction of undiscovered cultural resources	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Discovery of human remains	-	LTS (m)	LTS (m)	LTS (m)	LTS (m)
Damage to/destruction of documented cultural resources	-	-	-	-	LTS
Paleontological Resources					
Disturbance of paleontological resources	-	-	-	-	LTS (m)
Socioeconomic Effects					
Potential permanent decrease in local economic activity and fiscal revenues	-	LTS	LTS	LTS	-
Temporary economic and fiscal impact	-	LTS	LTS	LTS	-
Environmental Justice					
Potential disproportionate effects on minority and low-income populations	-	-	-	-	LTS
Growth-Inducing Effects					
Direct and indirect growth-inducing effects	-	-	-	-	-

- = no impact
B = beneficial or potentially beneficial impact
LTS = less-than-significant impact
LTS (m) = significant or potentially significant impact that would be less than significant with mitigation
SU = significant impact, despite mitigation (i.e., significant and unavoidable)

The potential adverse and beneficial effects of the Proposed Action, the Indirect Pipeline Alternative, and the Modified Operations Alternative are generally the same. Therefore, the number and magnitude of potential environmental impacts are generally similar for these project alternatives.

Following is a summary of the main points of comparison between the environmental effects of the alternatives for each resource area:

Delta Water Resources: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to the following: long-term changes in Delta water supplies; long-term changes in Delta water quality that cause violations of Delta water quality standards; long-term changes that result in substantial water quality degradation that would adversely affect beneficial uses or substantially change Delta users' operations; and long-

term changes in Delta water levels. Similarly, the Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would not substantially contribute to any cumulatively considerable impact related to Delta water resources.

The No-Action Alternative would not result in direct or indirect effects on water supply, water quality, or water levels for other Delta water users and would not contribute to any adverse cumulative water resource effects; however, CCWD currently does not meet its water quality objectives under all Delta conditions and operational modeling results indicate that under the No-Action Alternative, CCWD's ability to meet its delivered chloride objective under future conditions would decrease in comparison with existing conditions, average delivered salinity would increase, and the periods during which CCWD cannot meet its Board-adopted delivery objectives would be more frequent and of longer duration.

Delta Fisheries and Aquatic Resources: The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would adversely affect fisheries and aquatic resources during construction by potentially resulting in underwater sounds pressure impacts, potential chemical spills, and fish and macroinvertebrate stranding. All of these construction-related effects are expected to be reduced to a less-than-significant level with mitigation. The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would result in a beneficial impact with respect to net fish losses through entrainment and impingement because more pumping would be relocated from Rock Slough through the Alternative Intake Project. This benefit would be greatest under the Modified Operations Alternative because it would enable CCWD to relocate up to half of the current Rock Slough diversions to the screened Old River conveyance system in the near-term (compared to 30% reduction in Rock Slough intake diversions with the Proposed Action). The Desalination Alternative would result in a potentially significant direct and cumulative impact because of saline discharges from the new concentrate disposal pipeline; this impact would be reduced to a less-than-significant level through mitigation.

The No-Action Alternative would have no impact on fisheries and aquatic resources.

Earth Resources: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant impacts related to geologic hazards resulting from seismically induced or soil-related structural failure of proposed facilities. Completion of a design-level geotechnical study would reduce these impacts to a less-than-significant level.

The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would result in less-than-significant impacts related to soil erosion, while the Desalination Alternative would result in a potentially significant soil erosion impact; this impact would be reduced to a less-than-significant level with mitigation.

The No-Action Alternative would have no impact on earth resources.

Local Hydrology and Water Quality: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant impacts related to the temporary degradation of surface water quality as a result of construction activity; these impacts would be reduced to a less-than-significant level with the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative also have the potential to make a cumulatively considerable contribution to temporary water quality degradation if constructed simultaneously with some South Delta Improvements Program (SDIP) construction activities; however, coordination with SDIP constriction activity to minimize simultaneous in-water construction and cumulative water quality effects would reduce this cumulative impact to a less-than-significant level.

The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would result in less-than-significant impacts related to the potential contribution of project facilities to flooding, while the Desalination Alternative would result in a potentially significant flooding impact associated with the addition of impervious surfaces at the Bollman Water Treatment Plant site; this impact would be reduced to a less-than-significant level with the preparation of a drainage study and implementation of the resulting recommendations.

The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would result in less-than-significant impacts related to changes in local flooding potential as a result of levee modifications. Construction at the intake/pump station site on Victoria Canal has the potential to weaken the local levee system and increase the possibility of flooding of Victoria Island. However, the levee construction method and planned improvements to the levee at the location of the intake site would ensure that levee stability would be increased over existing conditions. The Desalination Alternative would have no impact related to levees.

The No-Action Alternative would have no impact on local hydrology and water quality.

Terrestrial Biological Resources: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative are expected to result in less-than-significant direct and cumulative impacts (with mitigation) to jurisdictional waters of the United States, sensitive habitat, and special-status wildlife and plant species. The No-Action Alternative would have no impact on terrestrial biological resources.

Land Use: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and No-Action Alternative would have essentially no impact related to conflicts with land use goals, policies, and regulations. Land use effects of the Desalination Alternative would be less than significant.

Agriculture: The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would permanently convert approximately 6–8 acres of Prime Farmland and Farmland of Statewide Importance in San Joaquin County to non-

agricultural uses, resulting in a significant and unavoidable direct and cumulative impact. The primary difference in effect between the Proposed Action and the Indirect Pipeline Alternative is that the Indirect Pipeline Alternative would reduce the acreage subject to temporary disruption of farming operations as compared to the Proposed Action. Under the Proposed Action (and Modified Operations Alternative), approximately 200–470 acres of farmland would be temporarily affected (i.e., during project construction), while under the Indirect Pipeline Alternative, approximately 155–305 acres would be temporarily affected. The No-Action Alternative and the Desalination Alternative would have no impact on agriculture.

Transportation and Circulation: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to temporary and long-term increase in traffic on local roadways.

With respect to temporary traffic and emergency vehicle delays and access restrictions, the Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative, which would be constructed in a mainly rural area, would result in less-than-significant impacts, while the Desalination Alternative, with components in urban areas, would result in a potentially significant impact, which would be reduced to a less-than-significant level with the preparation and implementation of a traffic control and safety assurance plan.

The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant temporary increases in traffic hazards on local roadways; these impacts would be reduced to less-than-significant levels with the preparation and implementation of a traffic control and safety assurance plan.

With respect to temporary disruptions to rail operations and transit service, the Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would have no impacts. The Desalination Alternative would result in a less-than-significant impact related to temporary disruptions to rail operations, and a potentially significant impact related to temporary disruptions to transit service, which would be reduced to a less-than-significant level with coordination with transit providers.

The No-Action Alternative would have no impact on transportation and circulation.

Air Quality: The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would result in significant direct and cumulative impacts related to the generation of short-term construction criteria air pollutant emissions. Implementation of San Joaquin Valley Air Pollution Control District (SJVAPCD) and Bay Area Air Quality Management District (BAAQMD) measures, these impacts would be reduced, but not to a less-than-significant level. These impacts are therefore considered significant and unavoidable. Similarly, the Desalination Alternative would result in a significant impact related to the generation of short-term construction criteria air pollutant emissions; however, this alternative would be constructed entirely in Contra

Costa County and would be subject only to BAAQMD significance thresholds. In accordance with BAAQMD guidance, this direct impact would be reduced to a less-than-significant level with implementation of the BAAQMD measures. However, even with implementation of the BAAQMD measures, the Desalination Alternative construction emissions would make a cumulatively considerable contribution to a significant air quality impact.

The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to the following: generation of long-term operational (regional) criteria air pollutant emissions, generation of long-term operational (local) mobile-source carbon monoxide emissions, exposure of sensitive receptors to toxic air contaminants, and exposure of sensitive receptors to odorous emissions.

The No-Action Alternative would have no impact on air quality.

Noise: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant impacts related to the generation of short-term construction noise. These impacts would be reduced to less-than-significant levels with use of feasible noise-control devices on construction equipment and adherence to a construction schedule that minimizes construction noise during noise-sensitive times of the day.

The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to the following: long-term increases in noise, and exposure of sensitive receptors to or generation of excessive ground-borne vibration or noise.

The No-Action Alternative would have no impact on noise.

Utilities and Service Systems: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant impacts related to the temporary disruption of utility services during construction; these impacts would be reduced to less-than-significant levels with implementation of mitigation measures to ensure that existing utilities are not damaged and service disruptions do not occur.

The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to increases in energy consumption and solid waste generation.

The No-Action Alternative would have no impact on utilities and service systems.

Hazardous Materials: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to the potential creation of a public health hazard through the use of hazardous materials and a potential wildfire hazard.

4.21 Summary of Impacts

The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant impacts related to the potential exposure of construction workers and CCWD personnel to hazardous materials; these impacts would be reduced to less-than-significant levels with coordination with the applicable landowners and land managers to ensure that temporary construction workers and CCWD personnel are not exposed to harmful levels of pesticides from adjacent agricultural practices.

The No-Action Alternative would have no impact on hazardous materials.

Visual Resources: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to temporary and long-term changes in scenic vistas, scenic resources, and existing visual character, and changes in light and glare.

The No-Action Alternative would have no impact on visual resources.

Recreation: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in less-than-significant impacts related to temporary and long-term changes in recreation opportunities.

The No-Action Alternative would have no impact on recreation.

Cultural Resources: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and Desalination Alternative would result in potentially significant impacts related to the following: damage to or destruction of undiscovered cultural resources, and discovery of human remains during construction; these impacts would be reduced to less-than-significant levels with mitigation.

There are no documented cultural resources on the alternative intake project site. Therefore, the Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would have no impacts related to documented cultural resources. The Desalination Alternative would have a less-than-significant impact related to previously documented cultural resources.

The No-Action Alternative would have no impact on cultural resources.

Paleontological Resources: Because no known paleontological resources are present at the Victoria Island/Byron Tract project site, the Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would have no impacts related to paleontological resources.

The Desalination Alternative would have a potentially significant impact related to paleontological resources, which would be reduced to a less-than-significant level with implementation of construction worker personnel education and construction monitoring

The No-Action Alternative would have no impact on paleontological resources.

Socioeconomic Effects: The Proposed Action, Indirect Pipeline Alternative, and Modified Operations Alternative would have less-than-significant impacts related to a potential permanent decrease in local economic activity and fiscal revenues, and a temporary economic and fiscal impact.

The Desalination Alternative and the No-Action Alternative would have no impacts on socioeconomic effects.

Environmental Justice: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, and No-Action Alternative would have no impacts related to environmental justice issues.

The Desalination Alternative would have a less-than-significant impact related to potential disproportionate effects on minority and low-income populations.

Growth-Inducing Effects: The Proposed Action, Indirect Pipeline Alternative, Modified Operations Alternative, Desalination Alternative, and No-Action Alternative would not result in direct or indirect growth inducement.

4.21.2 Less-than-Significant Impacts

Based on the environmental resource evaluations presented in Chapter 4.0, "Affected Environment and Environmental Consequences," of this EIR/EIS, the Proposed Action or alternatives would result in various less-than-significant effects, identified above in Table 4.21-1.

4.21.3 Adverse Environmental Effects that cannot be Reduced to a Less-than-Significant Level

NEPA requires that an EIS include a discussion of those adverse environmental effects that cannot be avoided through project redesign, mitigation measures, or the selection of an environmentally superior alternative. Similarly, the State CEQA Guidelines require a discussion of the significant environmental effects which cannot be avoided if the Proposed Action is implemented. In this EIR/EIS, these impacts are identified as significant and unavoidable.

Based on the environmental resource evaluations presented in Chapter 4.0, "Affected Environment and Environmental Consequences," of this EIR/EIS, the Proposed Action or alternatives would result in adverse environmental effects that cannot be reduced to a less-than-significant level to the following resource areas, as identified above in Table 4.21-1:

- Agriculture: permanent direct and cumulative impact of conversion of approximately 6–8 acres of Prime Farmland and Farmland of Statewide Importance (Alternatives 1–3); and

- Air Quality: short-term direct and/or cumulative construction emissions of criteria air pollutants (Alternatives 1–4).

4.21.4 Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

NEPA requires that an EIS include a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity.

The following discussion addresses how the Proposed Action would affect the short-term use and the long-term productivity of the environment. In general, "short-term" is used here to refer to the construction period, while "long-term" refers to the operational life of the Proposed Action and beyond.

Construction of the Proposed Action would result in short-term construction-related impacts such as interference with local traffic and circulation, limited air emissions, increase in ambient noise levels, dust generation, disturbance of wildlife, etc. These impacts would be temporary, occurring only during construction, and are not expected to alter the long-term productivity of the natural environment.

The Proposed Action would also assist in the long-term productivity of the environment by protecting and improving delivered water quality to CCWD customers and reducing diversion-related entrainment and impingement effects on Delta fisheries. These long-term beneficial effects of the Proposed Action would outweigh the potentially significant short-term impacts to the environment resulting primarily from project construction.

4.21.5 Irreversible and Irretrievable Commitments of Resources

NEPA requires that an EIS include a discussion of the irreversible and irretrievable commitments of resources which may be involved should the project be implemented. Similarly, the State CEQA Guidelines require a discussion of the significant irreversible environmental changes which would be involved in the project should it be implemented.

The irreversible and irretrievable commitment of resources is the permanent loss of resources for future or alternative purposes. Irreversible and irretrievable resources are those that cannot be recovered or recycled or those that are consumed or reduced to unrecoverable forms. The Proposed Action and alternatives, with the exception of the No-Action Alternative, would result in the irreversible and irretrievable commitment of energy and material resources during project construction, operation, and maintenance, including the following:

- construction materials, including such resources as rocks, wood, concrete, glass, roof shingles, and steel;
- human labor for project construction, operation, and maintenance;
- land area committed to new/expanded project facilities; and
- energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that would be needed for project construction, operation, and maintenance.

The use of these nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region.

Additionally, implementation of the Proposed Action or alternatives would result in the loss of wetlands and agricultural land, as detailed below.

Under Alternatives 1, 2, and 3, it is anticipated that permanent impacts to wetlands from project facilities, such as from the installation of riprap below the ordinary high water mark (OHWM) of Victoria Canal, would be a very small fraction of the total acreage present (see Section 4.6, "Terrestrial Biological Resources," for additional detail). Because of its substantially longer pipeline route, Alternative 2 has the potential to affect greater acreages of waters of the United States (as compared with the Proposed Action and Alternative 3) because of crossing more irrigation ditches.

Potential effects to wetlands that would occur with implementation of Alternative 4 have not been quantified because a wetland delineation has not been prepared for Alternative 4; however, based on the reconnaissance field visit and aerial photo interpretation, it is likely that Alternative 4 would result in the fill of jurisdictional waters of the United States. Mitigation measures have been identified to reduce impacts to wetlands, which may include the preparation of a conceptual wetlands mitigation plan, which would quantify the total jurisdictional acreage lost, and describe creation/replacement ratios for acres filled, annual success criteria, potential mitigation sites, and monitoring and maintenance requirements (see Mitigation Measure 4.6-a [Alternative 1]).

Approximately 6–8 acres of Prime Farmland and Farmland of Statewide Importance at Victoria Island would be permanently removed from agricultural use by the proposed intake/pump station that is associated with the Proposed Action and Alternatives 2 and 3.