4.7 Land Use

This section presents an analysis of potential land use impacts that would result from implementation of the Los Vaqueros Reservoir Expansion Project. The section includes a description of existing conditions, the associated regulatory framework (including applicable land use policies), significance criteria, and environmental impact analysis.

4.7.1 Affected Environment

Regulatory Setting

Federal

Federal Aviation Administration

The Federal Aviation Administration (FAA) is the branch of the U.S. Department of Transportation with regulatory responsibility for civil aviation. It is responsible for establishing policies and regulations to ensure the safety of the traveling public. The FAA oversees publicly owned airports that are open to the public and airports that receive federal funding.

FAA Advisory Circular 150/5200-33B addresses hazardous wildlife attractants on or near airports (FAA, 2007). This Advisory Circular is intended to provide guidance on siting certain land uses that have the potential to attract potentially hazardous wildlife to a public-use airport or its vicinity. The FAA Advisory Circular recommends against "land use practices that attract or sustain populations of hazardous wildlife within the vicinity of airports or cause movement of hazardous wildlife onto, into, or across the approach or departure airspace, aircraft movement area, loading ramps, or aircraft parking area of airports." The Advisory Circular recommends a separation distance of 5,000 feet between potential hazardous wildlife attractants and aircraft movement areas at facilities that support piston-powered aircraft, and a 10,000-foot distance between potential hazardous wildlife attractants and airports that support turbine-powered aircraft. The separation distance recommendation extends to 5 statute miles for approach-departure areas. For projects that are outside the 5,000 or 10,000-foot criteria but within 5 statute miles of the airport's air operations area, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine whether such changes in land use would create potential wildlife hazards to aircraft operations.

FAA is also responsible for enforcing the Federal Aviation Regulation (FAR) Part 77, Objects Affecting Navigable Airspace, which provides guidance for the height of objects that may affect normal aviation operations. Tall structures, construction cranes, trees, or high terrain on or near airports may constitute hazards to aircraft. Through the FAA regulatory review process, implementing agencies or project proponents submit design plans for proposed projects in the vicinity of airports for FAA to evaluate whether the project or its construction has the potential to interfere with normal aviation operations and create safety hazards for air travelers and those on the ground.

State

State Lands Commission

The State Lands Commission has jurisdiction over 4.5 million acres of land held in trust for Californians. The State Lands Commission's jurisdiction includes a 3-mile-wide section of tidal and submerged land next to the coast and offshore islands, including bays, estuaries, and lagoons. It also includes the waters and underlying beds of more than 120 rivers, lakes, streams, and sloughs. The State holds these lands for the public trust purposes of water-related commerce, navigation, fisheries, recreation, and open space. The State Lands Commission may grant dredging permits and issue land use leases for construction and operation of facilities within its jurisdiction. It does not have a comprehensive use plan for these lands but manages them according to state laws and regulations.

Of the areas where facilities could be sited under the proposed project, the commission's jurisdiction includes Old River, at the location of the existing Old River Intake and Pump Station and proposed new Delta Intake and Pump Station. Contra Costa Water District (CCWD) currently has a lease for the existing Old River Intake Facility, and a new lease would be required for a new Delta Intake and Pump Station. In addition, construction and operation of these facilities may require obtaining a General Permit from the State Lands Commission.

Land Use and Resource Management Plan for the Delta

The Delta Protection Act of 1992 established the Delta Protection Commission, a state entity created to plan for and guide the conservation and enhancement of the natural resources of the Delta while also sustaining agriculture and meeting increased recreational demand. The Delta Protection Act defines a Primary Zone, which is the principal jurisdiction of the Delta Protection Commission. The act requires the Delta Protection Commission to prepare and adopt a management plan for the Delta, which must meet specific goals.

In 1995, the Delta Protection Commission adopted the *Land Use and Resource Management Plan for the Delta*. Local general plans within the Primary Zone must be consistent with the management plan, and subsequent project approvals must be consistent with those general plans (Delta Protection Commission, 1995). No existing or proposed Los Vaqueros Reservoir Expansion facilities are within the Primary Zone of the Delta.

The Secondary Zone is the area outside the Primary Zone and within the "Legal Delta"; the Secondary Zone is not within the planning area of the Delta Protection Commission, but the Delta Protection Commission may comment on development projects within the Secondary Zone in the event that a project in the Secondary Zone could affect lands within the Primary Zone. Lands within the Secondary Zone are subject to the land use authority of local government. The Land Use section of the *Land Use and Resource Management Plan for the Delta* includes the following policies and land use recommendations related to development and activities within the Secondary Zone of the Delta:

> *P-8*. Local government policies regarding mitigation of adverse environmental impacts under the California Environmental Quality Act may allow mitigation beyond county boundaries,

if acceptable to reviewing fish and wildlife agencies, for example in approved mitigation banks. Mitigation in the Primary Zone for loss of agricultural lands in the Secondary Zone may be appropriate if the mitigation program supports continued farming in the Primary Zone.

R-5. To the extent possible, any development in the Secondary Zone should include an appropriate buffer zone to prevent impacts of such development on the lands in the Primary Zone. Local governments should consider needs of agriculture in determining such a buffer.

The Utilities and Infrastructure section of the *Land Use and Resource Management Plan for the Delta* includes the following policy related to development and activities within the Secondary Zone of the Delta:

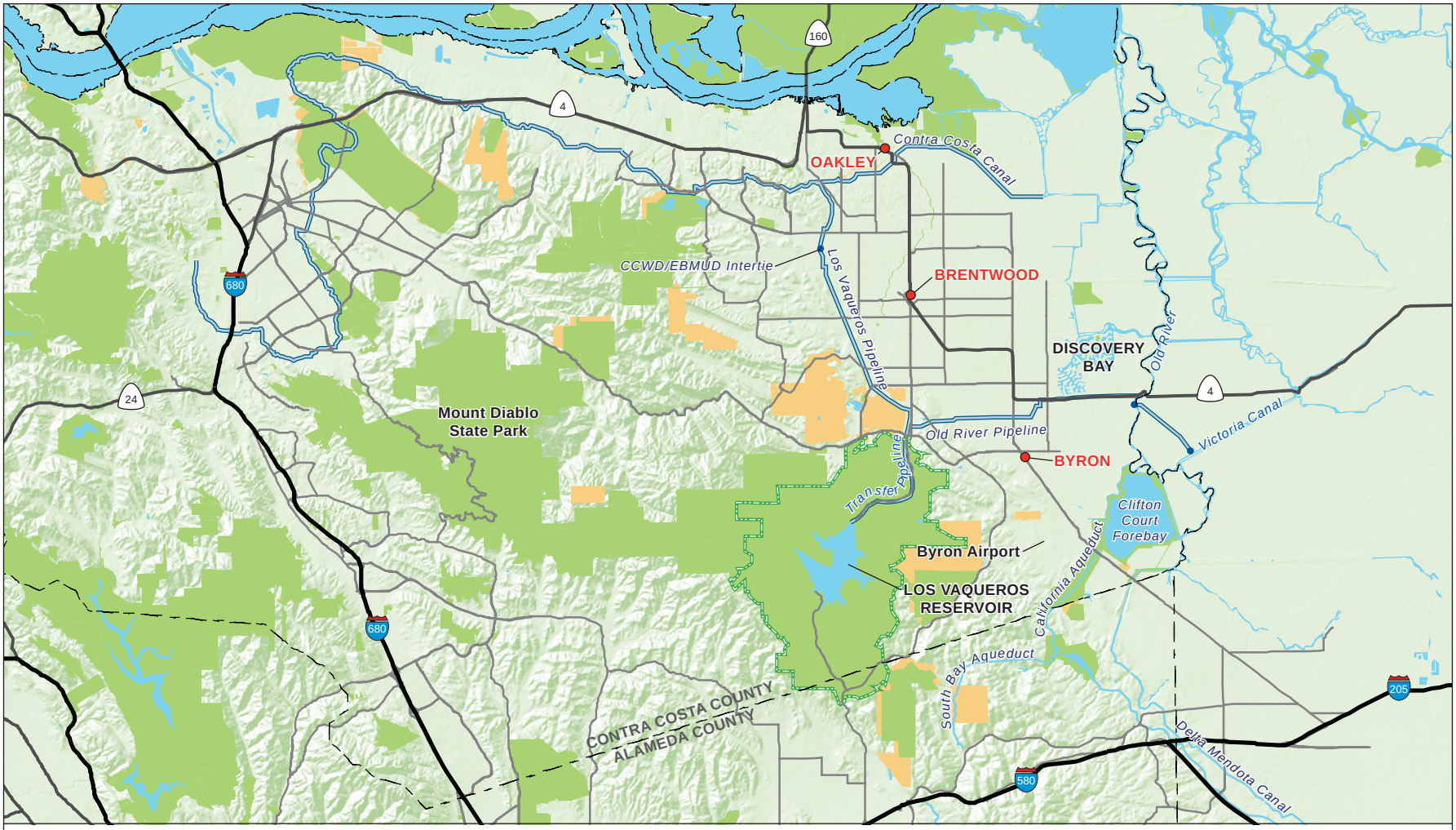
P-1. Impacts associated with construction of transmission lines and utilities can be mitigated by locating new construction in existing utility or transportation corridors, or along property lines, and by minimizing construction impacts. Before new transmission lines are constructed, the utility should determine whether an existing line has available capacity. To minimize impacts on agricultural practices, utility lines shall follow edges of fields. Pipelines in utility corridors or existing rights-of-way shall be buried to avoid adverse impacts to terrestrial wildlife. Pipelines crossing agricultural areas shall be buried deep enough to avoid conflicts with normal agricultural or construction activities. Utilities shall be designed and constructed to minimize any detrimental effect on levee integrity or maintenance (DWR, 1995).

Proposed project facilities within the Secondary Zone of the Delta include Delta Intake Facilities (both the existing Old River Intake and Pump Station and the new Delta Intake and Pump Station); most of the Delta-Transfer Pipeline; most of the Western Power Supply facilities including a potential Western Substation under Power Option 1 (Western Only); and the portion of the Transfer-Bethany Pipeline closest to the California Aqueduct (Eastside Option).

Local

As a special district that provides public utility services, CCWD is typically exempt (under Government Code Section 53091 et seq.*)* from local zoning and building ordinances. In addition, Sections 53091 and 53096 of the code exempt the location or construction of facilities for the production, generation, storage, treatment, or transmission of water from regulation under local zoning ordinances and (according to case law) general plans. There may be other local plans and regulations with which the proposed action and alternatives would need to be in compliance. Under other Government Code sections (Sections 65401 and 65402), CCWD is required to report to the local planning jurisdiction (i.e., city or county) any land acquisition or disposal, or the construction of any public building or structure, if a locally adopted general plan or part thereof is applicable to the proposed activity. The affected city or county has a period to review, comment, and make a determination of whether a proposed activity is consistent with its general plan; however, CCWD's Board of Directors can overrule this determination by a four-fifths vote.

Throughout this Environmental Impact Statement/Environmental Impact Report (EIS/EIR), local planning documents and relevant policies are discussed to provide additional information to the public, other agencies, and decision-makers, although these plans and policies may not be directly applicable to CCWD and the proposed project. **Figure 4.7-1** shows the communities in the vicinity of the Los Vaqueros Expansion Project.



SOURCE: USGS, 1993 (base map); Contra Costa County, 2005; and ESA, 2007

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Figure 4.7-1
Communities in the Vicinity of the
Los Vaqueros Expansion Project

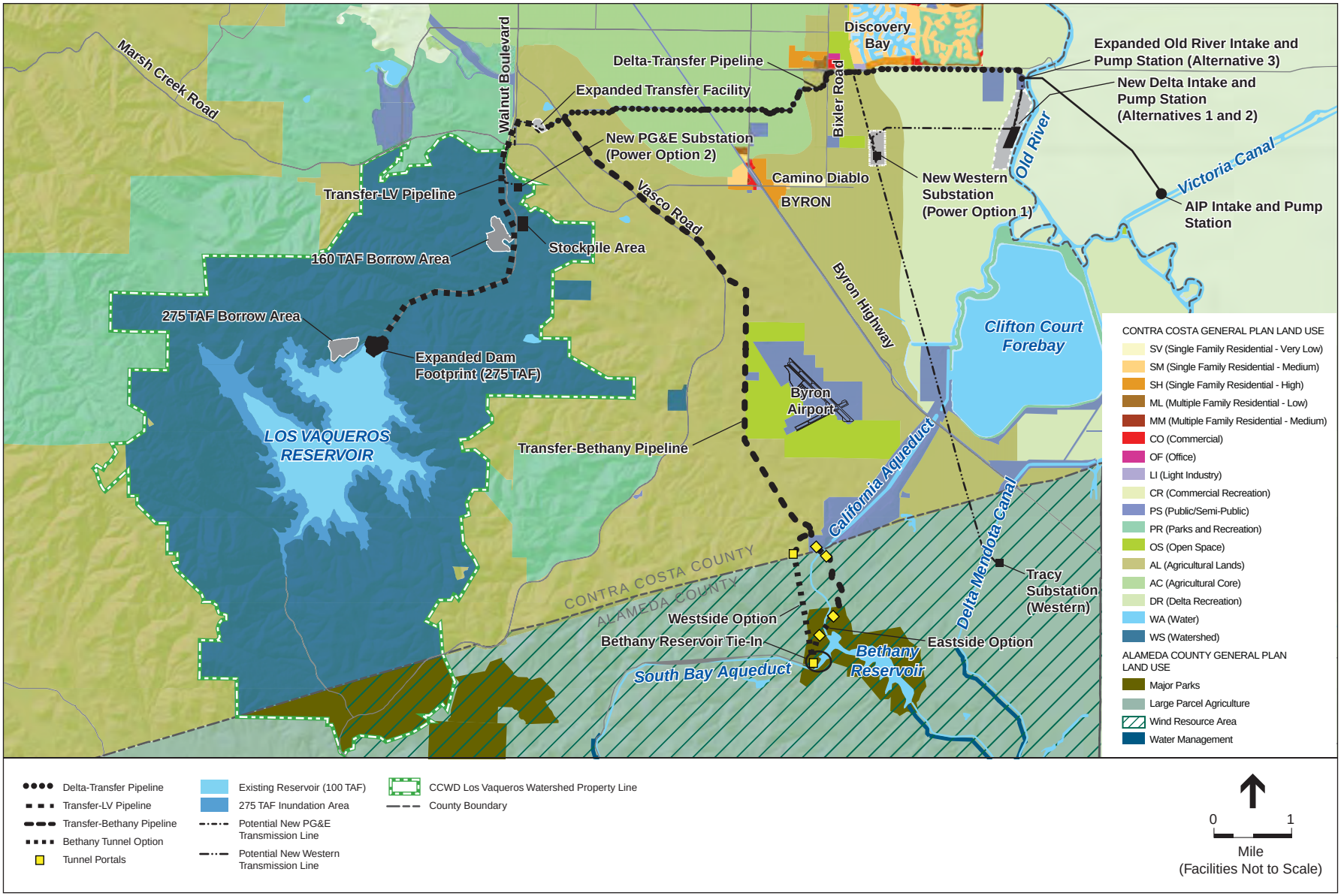
Contra Costa County General Plan

The Contra Costa County General Plan identifies goals, policies, and implementation measures related to the future development of unincorporated areas of the county. The General Plan provides overall policy direction as well as providing adopted land use policies specific to the East County Area and to the Southeast County Area (a part of the East County Area). The East County geographic area covers the eastern quarter of the county, which includes all proposed project components, while the Southeast County area covers the Los Vaqueros Watershed and also east and south to the county line (Contra Costa County, 2005a). Although the East County Area covers the northern portion of the project area, East County Area policies address land development near Oakley and in the Primary Zone of the Delta, and do not include topics relevant to the proposed project; therefore, policies for the East County Area are not discussed further in this EIS/EIR.

Adopted Southeast County Area policies in the General Plan address protection of natural and cultural resources that lie within the planning area for CCWD (Policy 3-70) and Los Vaqueros Reservoir (Policy 3-73). The full text of these policies is provided in Appendix E-2 of this EIS/EIR. Land use categories in the project area within Contra Costa County include Watershed, Agricultural Lands, Agricultural Core, Delta Recreation, Parks and Recreation, and Public/Semi-Public. These six categories are described below. Additional Southeast County Area policies include the preservation of agricultural and watershed areas for public uses, while allowing other uses in the area such as wind energy farms, mineral extraction, and reservoirs (Policy 3-68). Policy 3-69 indicates that pipelines and transmission lines are considered generally consistent with planned agricultural areas, subject to specific project review and county land use policies.

All anticipated project facilities would be outside of the county's Urban Limit Line (ULL). The ULL, which includes the unincorporated towns of Byron and Discovery Bay, is an established boundary beyond which no urban land uses can be established. The ULL ensures that non-urban agricultural, open space and other areas are preserved. **Figure 4.7-2** shows both the Contra Costa County General Plan and Alameda County "East County Area Plan (ECAP): A Portion of the Alameda County General Plan" land use designations for the project area (see subsection on ECAP below). ECAP serves as the general plan policy document for the area of Alameda County where a portion of the Transfer-Bethany Pipeline would be located.

Watershed. The Watershed designation primarily covers land owned by the two major water suppliers in Contra Costa County: the East Bay Municipal Utility District and CCWD. CCWD lands surrounding Los Vaqueros Reservoir are designated in the general plan as Watershed (see Figure 4.7-2). The purpose of the Watershed designation is to protect public water supplies. Uses within Watershed areas include public water supplies stored in reservoirs, such as the Los Vaqueros Reservoir. To safeguard such reservoirs, uses in Watershed areas are limited to livestock grazing; intensive agriculture that does not rely on pesticides or other chemical fertilizers; passive, low-intensity recreational uses such as hiking and biking; and small-scale commercial uses that support picnicking, boating, and fishing activities on the adjacent reservoirs (Contra Costa County, 2005a).



SOURCE: USGS, 1993 (base map); Alameda County, 2002; and ESA, 2008

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Figure 4.7-2

General Plan Land Uses

Proposed project facilities in the Watershed designation include the Los Vaqueros Reservoir Expansion/Dam Modifications with its Appurtenant Facilities (i.e., spillway, inlet-outlet works, and hypolimnetic oxygenation System), reservoir inundation areas, and borrow areas. Most of the Transfer-LV Pipeline, the westernmost electrical facilities (including a potential PG&E substation under Power Supply Option 2 [Western & PG&E]), and all CCWD recreational facilities (Marina Complex, Interpretive Center, hiking trails, access, and other facilities) are also in watershed-designated areas. Temporary construction facilities in the watershed designated area include staging areas and a stockpile area.

Agricultural Lands. The Agricultural Lands designation covers most of the privately owned rural lands in the county that are not composed of prime soils or located in or near the Delta. The purpose of the Agricultural Lands designation is to preserve and protect lands capable of and generally used for the production of food, fiber, and plant materials. This land use designation is not intended to exclude or limit other types of agricultural, open space, or non-urban uses. Additionally, allowable uses identified for lands under the Agricultural Core, Delta Recreation and Resources, Watershed, Parks and Recreation, and Open Space designations are allowed within Agricultural Lands. This includes water supply reservoirs and supporting pipelines and transmission lines (subject to specific project review) which are also allowed under the Watershed designation. The maximum allowable density in this category is one dwelling unit per 5 acres. Within Contra Costa County, a large portion of the area east of the Los Vaqueros administrative watershed boundary is designated as Agricultural Land. Much of this land is hilly and used for grazing livestock or for dry-grain farming.

Proposed Conveyance Facilities within the Agricultural Lands designated area include portions of the Delta-Transfer Pipeline; all of the Transfer Facility Expansion area; part of the Transfer-LV Pipeline; and the large majority of the Transfer-Bethany Pipeline to the Alameda County border. Proposed electrical supply facilities in the Agricultural Lands designated area include transmission lines and a potential Western Substation under Power Option 1 (Western Only) as well as some of the transmission lines under Power Option 2 (Western & PG&E).

Agricultural Core. The Agricultural Core designation applies to agricultural lands that are composed primarily of prime (Class I or II) soils, as identified by the Land Use Capability Classifications of the Natural Resources Conservation Service. Prime soils are considered to be the very best soils for farming a wide variety of crops. Lands designated as Agricultural Core lie to the east of the city of Brentwood, west of the town of Discovery Bay, and north of the town of Byron. Much of the land in this designation is being actively cultivated with intensive row crops.

The purpose of the Agricultural Core designation is to preserve and protect the county's farmlands that are the most capable of, and that are generally used for, the production of food, fiber, and plant materials. The Agricultural Core designation helps maintain economically viable, commercial agricultural units by requiring a higher minimum parcel size than the Agricultural Lands designation. Minor subdivisions and "ranchette" housing development are specifically discouraged.

The uses that are allowed in the Agricultural Core designation are generally the same as those allowed in the Agricultural Lands designation. The County General Plan discourages the placement of public roadways or new utility corridors that would adversely affect the viability of Agricultural Core lands, if economically feasible alternatives exist (Contra Costa County, 2005a).

Proposed project facilities within the Agricultural Core designation include a portion of the Delta-Transfer Pipeline and power transmission lines which will follow the same alignment as the pipeline. Both the Delta-Transfer Pipeline and the powerlines will be in an existing utility easement along State Route 4 (SR 4) or other existing roadway, and would not necessitate a new utility corridor.

Delta Recreation and Resources. The Delta Recreation and Resources land use designation encompasses the islands and adjacent lowlands of the San Joaquin–Sacramento Delta. In the vicinity of the proposed project, Delta Recreation and Resources lands are east and south of the town of Discovery Bay, extending south to Clifton Court Forebay. Delta Recreation and Resources lands are also east and south of Clifton Court Forebay. Much of the land designated as Delta Recreation and Resources is currently in agricultural production.

The Delta Recreation and Resources designation was created to balance the recreational opportunities in the area with the need to allow only low-intensity uses that will not subject residents or visitors to the flood dangers associated with the Delta. Agriculture and wildlife habitat are considered the most appropriate uses in the area; limited recreation uses that do not conflict with the predominant agricultural and habitat uses are also allowed.

Uses that may be allowed through the issuance of a land use permit include: marinas, shooting ranges, duck and other hunting clubs, campgrounds, and other outdoor recreation complexes. Conditional uses allowed on Delta Recreation and Resources lands are limited to uses that do not rely on urban levels of service or infrastructure (i.e., need a public water or sewer system) and that will not draw large numbers of people to flood-prone areas (Contra Costa County, 2005a).

Proposed project facilities within the Delta Recreation and Resources designation include the new Delta Intake and Pump Station, the eastern portion of the Delta-Transfer Pipeline, and a small portion of the transmission line under Power Option 1 (Western only).

Parks and Recreation. The Parks and Recreation designation includes publicly owned city, county, CCWD, and regional park facilities. Public and privately owned golf courses are also designated as Parks and Recreation.

Allowable uses in the Parks and Recreation land use designation are passive and active recreation-oriented activities and associated commercial uses such as snack bars and restaurants. This General Plan designation does not allow new privately owned residences or commercial uses or the subdivision of land (Contra Costa County, 2005a).

Less than 1 acre of a temporary construction easement for the Transfer-LV Pipeline would extend into Parks and Recreation designated land next to Walnut Boulevard.

Public/Semi-Public. The Public and Semi-Public land use designation includes properties owned by public governmental agencies (i.e., CCWD), public transportation corridors, and privately owned transportation. Allowable land uses include transportation and utility corridors, such as railroads, PG&E lines, and pipelines. This General Plan category allows a wide variety of public and private uses. Private residences, private commercial uses, and the subdivision of land are not considered compatible with this designation (Contra Costa County, 2005).

Proposed project facilities within the Public/Semi-Public land use designation include the existing Old River Intake and Pump Station, a small portion of the Delta-Transfer Pipeline, and possibly a portion of the Transfer-Bethany Pipeline under its Eastside Option, near the California Aqueduct. The Byron Airport, a county-owned general aviation airport, also occurs under this designation.

Alameda East County Area Plan – A Portion of the Alameda County General Plan

The ECAP was adopted in 1994 and most recently updated in 2002 as a portion of Alameda County's General Plan. The purpose of the ECAP is to present a clear statement of Alameda County's intent concerning future development and resource conservation within East County. East County (formerly called the Livermore-Amador Valley Planning Unit) encompasses 418 square miles of eastern Alameda County and includes the cities of Dublin, Livermore, Pleasanton, and a portion of Hayward as well as surrounding unincorporated areas. The planning area extends from the Pleasanton/Dublin ridgeline on the west to the San Joaquin County line on the east, and from the Contra Costa County line on the north to the Santa Clara County line on the south.

ECAP's primary goal is to "clearly delineate areas suitable for urban development and open space areas for long-term protection of natural resources, agriculture, and public safety." It implements its stated purpose through emphasis on use of land outside of urban growth boundaries for non-urban purposes (Alameda County, 2002). Other goals pertain to the protection of regionally significant open space (Open Space Goal), the maximization of long-term productivity of East County's agricultural resources (Agriculture Goal), the protection of watershed lands from the direct and indirect effects of development (Watershed Goal), and the protection of biological and scenic resources (Biological Resources and Scenic Viewsheds Goals) (Alameda County, 2002). These goals and policies are listed in Appendix E-1 of this EIS/EIR.

The geographic area of the ECAP includes the southernmost portion of the two Transfer-Bethany Pipeline alignment options (Westside Option and Eastside Option). Both Transfer-Bethany Pipeline Options cross ECAP land areas designated Large Parcel Agriculture, Major Parks, and Wind Resource Area, all defined below. The Los Vaqueros Reservoir Expansion Project is outside of the ECAP Urban Growth Boundary.

Large Parcel Agriculture. This land use designation permits agricultural uses, agricultural processing facilities, limited agricultural support service uses, secondary residential units, visitor-serving commercial facilities, recreational uses, public and quasi-public uses, solid waste landfills and related waste management facilities, quarries, wind farms, and related facilities, utility corridors, and similar uses compatible with agriculture (Alameda County, 2002). Portions of both potential Transfer–Bethany Pipeline alignments (Westside Option and Eastside Option) are within lands designated as Large Parcel Agriculture.

Major Parks. The Major Parks land use designation provides for existing and planned public parks, open space, and recreational uses including community, subregional, and regional facilities (Alameda County, 2002). The existing Bethany Reservoir and portions of both the Westside and Eastside Options for the Transfer-Bethany Pipeline are within the Major Parks designation area.

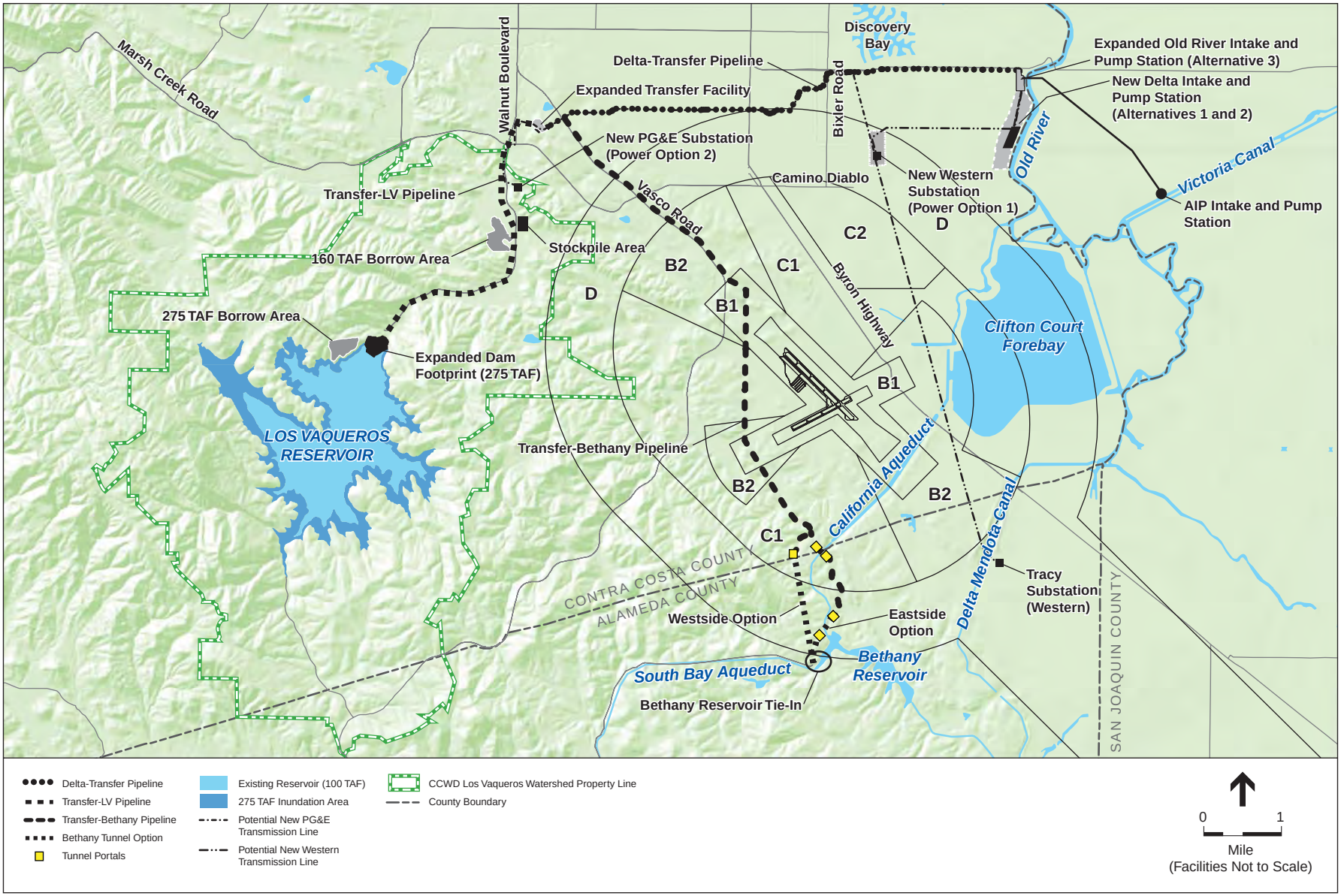
Wind Resource Area. The Wind Resource Area overlays much of the Large Parcel Agriculture and the Major Parks land use designations. Policy 173 of the ECAP discourages the development of uses and structures within areas designated as a Wind Resource Area that are not compatible with wind-energy operations. Currently, in addition to wind energy facilities, agriculture is the primary use in this area (Alameda County, 2002). The existing Bethany Reservoir and portions of both the Westside and Eastside Options for the Transfer-Bethany Pipeline are within the Wind Resource Area.

Contra Costa County Airport Land Use Compatibility Plan

The Contra Costa County Airport Land Use Compatibility Plan (ALUCP) serves as a planning tool to promote compatibility between airports in Contra Costa County and the surrounding land uses. The Contra Costa County Airport Land Use Commission adopted an ALUCP in December 2000. The Commission uses the ALUCP to review airport and adjacent land use development proposals. Other local agencies use compatibility criteria included in the ALUCP to prepare or amend their land use plans and ordinances (ALUCP, 2000). According to the State Aviation Act, General Plans must be made consistent with the ALUCP within 18 months of its adoption.

The Contra Costa County ALUCP presents land use policies that pertain only to the Airport Influence Area (AIA) associated with two airports: Buchanan Field Airport (in western Contra Costa County) and Byron Airport. The AIA associated with each airport includes the area that could be affected by aircraft noise, safety, overflight impacts, or potential hazards to aircraft. The AIA for each airport extends about 2 to 3 miles from the airport runways. Byron Airport is about 1 mile east of the Transfer-Bethany Pipeline alignment along Vasco Road, and 3 miles south of the Delta-Transfer Pipeline along SR 4. In addition, about 1 mile east of the airport, a 69 kilovolt (kV) electrical power line is proposed for construction within an existing transmission corridor under Power Option 1 (Western Only). **Figure 4.7-3** shows these pipelines and the transmission line in the vicinity of Byron Airport and within the ALUCP compatibility zones.

ALUCP policies identify potential limitations associated with land uses, building designs, structure heights, and population densities and intensities for areas near the Byron Airport, and typically require the Airport Land Use Commission to review proposed objects within the AIA. Height limitations, which are relevant to the proposed project power line poles, range from 35 feet for areas closest to the runway (Zone B1) to 70 feet (Zone B2) to 100 feet (Zones C1, C2, and D). Additional limitations are set with regard to noise exposure (addressed in Section 4.11) and Hazards to Flight (Policy 6.9.3) such as water bodies or landscape features to attract birds and electrical hazards. The Compatibility Criteria for Zones B1, B2, C1, C2, D, and "All Zones" is included in Appendix E of this EIS/EIR (ALUCP, 2000).



SOURCE: Shutt Moen Associates, 1998; and ESA, 2008

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Figure 4.7-3

Byron Airport Land Use Compatibility Zones

The ALUCP includes countywide policies, which apply to the AIA associated with both airports, and airport-specific policies that apply only to the AIA for Byron Airport. The applicable county-wide and airport-specific policies are summarized below:

Countywide Policies

4.3.1. Basis for Height Limits — To protect the airspace necessary for the operation of aircraft approaching, departing, or otherwise flying in the vicinity of airports, limits must be set on the height of objects on the land below. The basic criteria for limiting the height of structures, trees, and other objects near airports are set by federal regulations: Part 77, Subpart C, of the Federal Aviation Regulations (FAR); the United States Standard for Terminal Instrument Procedures (TERPS); and applicable airport design standards.

(a) Unless specific exceptions have been evaluated and determined not to adversely affect air navigation, these criteria as applied to Buchanan Field Airport and Byron Airport shall be used as the basis for setting limits on the heights of objects in the vicinity of those airports.

(b) Airspace plans depicting the critical areas for airspace protection around Buchanan Field and Byron Airport are depicted in Chapters 3 and 4, respectively.

4.3.2. Height Limit Exceptions — In all parts of the AIA for both Buchanan Field and Byron Airport, proposed structures may be allowed to exceed the criteria stated in the height limit policies for the respective airport, subject to review and approval by the ALUC on a case-by-case basis.

(a) A detailed airspace analysis, including a Federal Aviation Administration aeronautical study, shall be required. The analysis shall assess the potential affect of the proposed structure on instrument approach procedures, airport utility, and overall aviation safety. Consideration shall also be given to the potential effects on new or enhanced instrument approach procedures which may be developed in the future as indicated on the adopted airport layout plan.

(b) The FAA and/or the Contra Costa County Airport Land Use Commission may require marking and lighting of any objects for which a height limit exception is granted. Any such marking and lighting shall be done in a manner consistent with applicable FAA standards.

4.3.4. FAA Notification — Proponents of a project which may exceed a Part 77 surface must notify the FAA as required by FAR Part 77, Subpart B, and by the State Aeronautics Act, Sections 21658 and 21659. (Notification to the FAA under FAR Part 77, Subpart B, is required even for certain proposed construction that does not exceed the height limits allowed by Subpart C of the regulations.)

(a) Local jurisdictions shall inform project proponents of the requirements for notification to the Federal Aviation Administration.

(b) The requirement for notification to the FAA shall not necessarily trigger an airport compatibility review of an individual project by the Airport Land Use Commission unless required in accordance with the Buchanan Field Airport or Byron Airport airspace protection and height limit policies set forth in Chapters 3 and 4.

(c) Any project submitted to the ALUC for airport land use compatibility review for reason of height-limit issues shall include a copy of FAR Part 77 notification to the Federal Aviation Administration and the results of the FAA's analysis.

4.3.6. Other Flight Hazards — Land uses which may cause visual, electronic, or bird strike hazards to aircraft in flight shall not be permitted within any airport's influence area. Specific characteristics to be avoided include:

(a) Glare or distracting lights which could be mistaken for airport lights;

(b) Sources of dust, steam, or smoke which may impair pilot visibility;

(c) Sources of electrical interference with aircraft communications or navigation; and

(d) Any use, especially landfills and certain agricultural uses, which may attract an increased number of birds. (Refer to FAA Advisory Circular No. 150/5300-33B, *Hazardous Wildlife Attractants On or Near Airports*, and Order No. 5200.5A, *Waste Disposal Sites On or Near Airports* for specific guidelines.)

Policies Specific to Byron Airport

6.3 Compatibility Zone 'B1' Criteria

6.3.4. Height Limitations — Unless a specific exemption is granted (see Countywide Policy 4.3.2.), the height of objects within Compatibility Zone B1 shall be limited in accordance with the Byron Airport Airspace Protection Surfaces drawing.

(a) Generally, there is no concern with regard to any object up to 35 feet tall.

(b) ALUC review is required for any proposed object taller than 35 feet.

6.4 Compatibility Zone 'B2' Criteria

6.4.4. Height Limitations — Unless a specific exemption is granted (see Countywide Policy 4.3.2.), the height of objects within Compatibility Zone B2 shall be limited in accordance with the Byron Airport Airspace Protection Surfaces drawing.

(a) Generally, there is no concern with regard to any object up to 70 feet tall unless it is located on high ground or it is a solitary object (e.g., an antenna) more than 35 feet taller than other nearby objects.

(b) ALUC review is required for any proposed object taller than 70 feet.

6.5. Compatibility Zone 'C1' Criteria

6.5.4. Height Limitations — Unless a specific exemption is granted (see Countywide Policy 4.3.2.), the height of objects within Compatibility Zone C1 shall be limited in accordance with the Byron Airport Airspace Protection Surfaces drawing.

(a) Generally, there is no concern with regard to any object up to 100 feet tall unless it is located on high ground or it is a solitary object (e.g., an antenna) more than 35 feet taller than other nearby objects.

(b) ALUC review is required for any proposed object taller than 100 feet.

6.7. Compatibility Zone 'D' Criteria

6.7.4. Height Limitations — See criteria for Compatibility Zone C1.

6.9. Compatibility Criteria — All Zones

6.9.3. Hazards to Flight — No land use which would result in an increased attraction of birds or would create a visual or electronic hazard to flight shall be permitted anywhere within the Byron Airport influence area. (See Countywide Policy 4.3.6.)

Reclamation District 800

The Reclamation District Law (Water Code Section 50000 et seq.) provides a means for local entities to form reclamation districts to finance the reclamation of land that has been made unusable by overflow or flooding. Reclamation districts assess fees from members of their district to finance services and facilities related to land reclamation, such as levees and irrigation and drainage facilities. Construction activities associated with the proposed new Delta Intake and Pump Station would occur on levees next to Old River and within Byron Tract. Byron Tract is under the jurisdiction of Reclamation District 800. Because the new intake would require levee work, project construction could be subject to review and approval of an encroachment permit and maintenance easement by Reclamation District 800.

Existing Land Uses

The eastern portions of Contra Costa and Alameda Counties primarily consists of lands used for agriculture, grazing, and recreation. Most of the upland areas are used for grazing rather than crops. Irrigated agricultural production is limited to the lands north and east of Los Vaqueros Reservoir and toward the Delta. Urban areas in eastern Contra Costa and Alameda Counties are limited to the cities of Brentwood, Oakley, and Livermore, plus the unincorporated communities of Byron and the town of Discovery Bay. Only Brentwood, Byron, and Discovery Bay are in the immediate project area.

The nearest incorporated city is Brentwood, with its city limits about 4 miles north of Los Vaqueros Reservoir. The unincorporated community of Byron is about 5 miles northeast of the reservoir. The Byron Airport is south of Byron. The unincorporated town of Discovery Bay is about 1 mile northeast of Byron. In Alameda County, the nearest urban area is Livermore, about 7 miles south of Los Vaqueros Reservoir. Nearby communities are identified in Figure 4.7-1. Rural residential properties are scattered throughout agricultural portions of the project area, and some residences are near portions of the proposed pipeline alignments.

The Los Vaqueros Watershed, depicted on Figure 4.7-2, is owned and administered by the CCWD and is accessible to the public. Large areas of publicly held land lie within the project vicinity. Next to the reservoir watershed are Brushy Peak Regional Preserve (2,014 acres), Vasco Caves Regional Preserve (1,426 acres), Cowell Ranch Open Space (3,687 acres), Round Valley Regional Preserve (1,895 acres), and Morgan Territory Regional Preserve (4,708 acres). Other nearby public lands include the Bethany Reservoir State Recreational Area (802 acres), Clifton Court Forebay (36 acres), and Mount Diablo State Park (18,839 acres) (see Figure 4.15-1). These lands (except for Clifton Court Forebay) are administered by the East Bay Regional Park District or the California State Parks systems. Clifton Court Forebay is owned and operated by the Department of Water Resources and generally has limited public access.

The Transfer-Bethany Pipeline (Eastside Option) would pass through about 0.3 mile of the Bethany Reservoir State Recreation Area but the public does not have access to the area where the project pipeline/tunnel construction would occur (see Section 4.15, Recreation, for further discussion of project effects on recreational areas and opportunities). No other proposed conveyance, power, or project facilities pass through these open space areas, preserves, or public lands.

Sensitive Land Uses

Some sensitive land uses, including the town of Discovery Bay residential community and Bethany Reservoir State Recreation Area, are near (i.e., within a half mile of), or within proposed project construction areas. No construction would occur within the cities of Brentwood or Livermore, or the unincorporated towns of Byron or Discovery Bay. No schools, hospitals, rest homes, or similar sensitive public or private land uses are in proximity to anticipated construction. The following list summarizes the location and number of residences near each proposed project area or facility site.

- *Los Vaqueros Watershed* – This area includes the reservoir expansion area, in-watershed facilities construction sites, borrow material and staging sites, and recreational facility sites. One residence off Los Vaqueros Road is about 2 miles south of the reservoir. There are also 12 residences on the ridge west of the watershed near Morgan Territory Road, about 1.6 miles from the reservoir and 3 miles from the reservoir dam site. In addition, several residences are about 2.5 miles northeast of the expanded dam site, off Silver Hills Drive near the north entrance to the watershed.

- *Delta Intake and Pump Station* – The sensitive land use closest to the existing Old River Intake and Pump Station is a house about 3,000 feet to the northwest along SR 4. The residence closest to the proposed new Delta Intake and Pump Station is a single farmhouse on the east side of Old River. This facility could be between 500 and 1,000 feet from this residence, depending on the location selected for it.

- *Delta-Transfer Pipeline* – Construction would occur along the south side of SR 4, as close as 50 feet from the town of Discovery Bay where as many as 120 residences are along the north side of SR 4 along the pipeline alignment. About 16 rural home sites lie within 50 feet of the 6.5-mile pipeline route as it passes along SR 4, Bixler Road, Kellogg Creek Road, and Hoffman Lane.

- *Transfer Facility Expansion* – The residence nearest to the Transfer Facility is along Walnut Avenue, about 1,450 feet west of the anticipated construction site.

- *Transfer-LV Pipeline* – About 5 rural residences along Camino Diablo and Walnut Avenue lie within 50 feet of the Transfer-LV Pipeline alignment.

- *Transfer-Bethany Pipeline* – An estimated 7 rural homesteads near Vasco Road or Armstrong Road lie as close as 50 feet to the Transfer-Bethany Pipeline alignment. The Bethany Reservoir State Recreation Area, with a bikeway along the California State Aqueduct, is along the pipeline alignment (Eastside Option) near the southern terminus of the pipeline. The project construction area at Bethany Reservoir for the tie-in is not accessible to the public and is over 300 feet from a public access area.

- *Power Option 1* – There would be no physical construction activity on the transmission line from Western's existing Tracy substation to the new substation in the project area. The existing Western transmission line would feed the new substation. The nearest rural residences are about 1,275 feet away from the new substation and upgraded transmission line to be extended from the new substation east to the new Delta Intake Pump Station. The new 21kV transmission line that would extend west to the Transfer Facility Expansion would be constructed along a portion of SR 4, in the same corridor as the Delta-Transfer Pipeline. An estimated 16 rural home sites lie within 50 feet of the proposed transmission lines.

- *Power Option 2* – Like Power Option 1, Power Option 2 would make use of Western's existing transmission line that extends northwest from its existing Tracy substation; no facility changes or new construction would occur along this existing transmission line. The existing Western transmission line that extends east to service the Old River Pump Station would be upgraded but this option does not include a new Western substation. About 4 rural home sites are 1,275 feet or more from the Western transmission line proposed for upgrade. A new overhead transmission line would be extended from PG&E's existing facilities in Brentwood, in the same corridor as the proposed Transfer-LV Pipeline. About 5 rural residences along Camino Diablo Road and Walnut Avenue lie within 50 feet of the joint transition line and pipeline alignment. The new PG&E substation required under this option would be on CCWD Los Vaqueros Watershed property. The residence nearest to this proposed substation lies within 500 feet of this property and is off Silver Hills Drive.

- *Recreation Facilities* – The recreation facilities that would be replaced and expanded within the Los Vaqueros Watershed would be near and around the reservoir. The homes closest to the reservoir include 12 residences on the ridge west of the watershed near Morgan Territory Road, about 1.6 miles from the reservoir and 3 miles from the Marina Complex site. A single residence off Los Vaqueros Road to the south is located about 2 miles from the reservoir and 4.8 miles from the proposed Marina Complex. In addition, several residences are about 2.5 miles northeast of the expanded dam site, off Silver Hills Drive near the north entrance to the watershed.

Although these sensitive land uses would not experience long-term impacts, a number of temporary construction impacts would affect residents and visitors to these areas. Potential construction impacts to sensitive users resulting from the proposed project are addressed in their respective sections: Agriculture (Section 4.8), Transportation and Circulation (Section 4.9), Air Quality (Section 4.10), Noise (Section 4.11), Visual/Aesthetic Resources (Section 4.14), and Recreation (Section 4.15).

4.7.2 Environmental Consequences

Methodology

For purposes of this environmental analysis, the EIS/EIR evaluates the potential for the project and alternatives to conflict with the Contra Costa County or Alameda County General Plan Land Use policies. The standard for determining whether a project component would conflict with a general plan policy use is based on the *General Plan Guidelines*, published by the Office of Planning and Research: "An action, program, or project is consistent with the general plan if, considering all its aspects, it will further the objectives and policies of the general plan and not obstruct their attainment" (OPR, 2003).

Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. These thresholds also encompass the factors taken into account under the National Environmental Policy Act (NEPA) to determine the significance of an action in terms of its context and the intensity of its effects. A significant land use effect determination was applied to an alternative that would do any of the following:

- Physically divide an established community
- Conflict with any applicable land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating a significant environmental effect
- Conflict with any applicable Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP)

Discussions of consistency with land use and zoning designations are provided below for the proposed alternatives. As previously explained, CCWD is not subject to local general plan and zoning regulations. However, discussions of consistency with the land use designations of the general plans are provided to give context and to fully inform the public and the decision makers.

The potential for the project alternatives to conflict with applicable HCPs or NCCPs is addressed in Section 4.6, Biological Resources in the regulatory setting for local agencies and under Impact 4.6.17. The potential to conflict with HCPs and NCCPs is not discussed further in this section.

Impact Summary

Table 4.7-1 provides a summary of the impact analysis for issues related to land use based on actions outlined in Chapter 3.

TABLE 4.7-1
SUMMARY OF IMPACTS – LAND USE

Impact	Project Alternatives			
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
4.7.1: The proposed project and alternatives would not physically divide an existing community.	NI	NI	NI	NI
4.7.2: Facility siting and operation under the proposed project and alternatives would not conflict with any applicable land use plans.	LS	LS	LS	LS
4.7.3: Construction activities within designated Airport Land Use Compatibility Zones near the Byron Airport could cause potential temporary height impacts by conflicting with FAR Part 77 surfaces during construction.	LSM	LSM	LSM	LS
4.7.4: Construction activities within the AIA for Byron Airport could cause potential temporary flight hazards through the creation of glare or distracting lights; the generation of dust or smoke, which could impair pilot visibility; or could attract an increased number of birds.	LSM	LSM	LSM	LSM
4.7.5: The proposed project and alternatives would not contribute to cumulative land use impacts.	NI	NI	NI	NI

NOTES:

SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact
AIA = Airport Influence Area
FAR = Federal Aviation Regulation

Impact Analysis

No Project/No Action Alternative

Under the No Project/No Action Alternative, no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Therefore, no impacts related to land use would occur from implementing this alternative.

Impact 4.7.1: The proposed project and alternatives would not physically divide an existing community. (No Impact)

Alternative 1

The project area extends throughout southeastern Contra Costa County and northeastern Alameda County. As previously indicated, the city of Brentwood (in Contra Costa County) is about 4 miles north of the project area, and the city of Livermore (in Alameda County) is 7 miles south of the project area. Two established communities are in the project area — the towns of Byron and Discovery Bay. Numerous rural residential homes are scattered throughout the project area; however, for purposes of this Impact 4.7.1 assessment, they are not considered to be a community that would be subject to division.

Reservoir Expansion and Recreational Facilities. Alternative 1 involves a 275-thousand acre-foot (TAF) Reservoir Expansion/Dam Modification project with borrow areas, PG&E substation (under Power Option 2), and recreation facilities constructed within the CCWD Los Vaqueros Watershed property. Because facilities on existing CCWD watershed property would not affect existing local communities, they are not discussed further in this impact discussion. However, Alternative 1 would also involve construction of facilities in areas outside of the watershed, which are considered below.

Delta Intake and Pump Station. The new Delta Intake and Pump Station is in an agricultural area next to Old River, away from existing communities and other sensitive land uses. Therefore, construction of this facility would not divide an existing community.

Conveyance Facilities. Under Alternative 1, construction of three water conveyance pipelines and expansion of an existing Transfer Facility would occur. The Delta-Transfer Pipeline would be along SR 4, within an existing transportation corridor that passes south of the town of Discovery Bay. The Transfer Facility Expansion would occur on CCWD land next to the existing Transfer Facility, in an area surrounded by agricultural land and next to a quarry operation. Expansion of the Transfer Facility would not divide an existing community.

The Transfer-LV Pipeline alignment passes in close proximity to numerous individual residences, but not through an existing community. The Transfer-Bethany Pipeline would pass south along Vasco Road, avoiding the town of Byron, which is along the Byron Highway, to the east. Because all conveyance facilities would be outside of existing communities in largely rural, agricultural areas, and also because underground pipelines are easily traversable by roads, construction of

project conveyance facilities would not result in the physical division of any established community.

Power Supply. To accommodate a new Delta Intake and Pump Station as well as the expansion of the Transfer Facility, additional overhead electrical powerlines and a substation would be required. Two options for electrical facilities currently under consideration include Power Option 1 (Western Only), and Power Option 2 (Western & PG&E). Construction of Power Option 1 includes a new power line from a new Western substation site to the new Delta Intake facilities, with a new Western substation at the eastern terminus of Camino Diablo Road. Power Option 2 would entail a new PG&E substation within the CCWD Los Vaqueros Watershed property in an area to the north of the staging area, plus a new distribution line connecting the new PG&E substation to the Expanded Transfer Facility.

Most of the proposed power facilities (with the exception of a new Western substation) would occur within an existing transmission line right-of-way or on watershed land. The alignment of Power Option 2 would be along SR 4 in an area west of the town of Discovery Bay. Because the new power facilities would be outside of existing communities in largely rural, agricultural areas, and also because overhead powerlines are easily traversable by roads, implementation of either option for electrical facilities would not result in the physical division of any established community.

Summary. All project construction under Alternative 1 would be in areas that avoid the two established communities in the project area — the towns of Byron and Discovery Bay. Moreover, the Conveyance and Power Supply Facilities are easily traversable. Alternative 1 would not physically divide an existing community.

Alternative 2

The facilities included in Alternative 2 would be the same as those under Alternative 1. Therefore, this alternative would not physically divide an existing community.

Alternative 3

Construction of Alternative 3 would include the same components as discussed for Alternative 1 with three substantive differences:

- Expansion of the Old River Intake and Pump Station would occur within the facility's existing site area.
- Alternative 3 would not include a new Delta Intake and Pump Station.
- Alternative 3 would not include the Transfer-Bethany Pipeline.

Expansion of the Old River Intake and Pump Station would not affect any existing communities or other sensitive land uses and therefore would not divide an existing community. While there would be no construction of the new Delta Intake and Pump Station or Transfer-Bethany Pipeline under Alternative 3, this would not reduce the level of impact as compared to Alternative 1 because no communities or sensitive land uses would be affected by these facilities. As with Alternative 1,

Alternative 3 would not physically divide an existing community or affect sensitive land uses, and no impacts would occur.

Alternative 4

Alternative 4 would involve a 160-TAF Reservoir Expansion with a borrow area and recreational facilities to be constructed within the CCWD Los Vaqueros Watershed property line. Under this alternative, the capacity of the existing Transfer Station would be expanded; however, the footprint of this facility would not be expanded, as would occur for other alternatives. Alternative 4 does not include construction of any Delta intake, conveyance or power supply facilities and, consequently, would not impact any existing communities. As with Alternative 1, this alternative would not physically divide an existing community and no impact would occur.

Mitigation: None required.

Impact 4.7.2: Facility siting and operation under the proposed project and alternatives would not conflict with any existing land use plans. (Less than Significant)

Alternative 1

Land Use and Resource Management Plan for the Delta

No existing or proposed Los Vaqueros Reservoir Expansion project facilities are within the Primary Zone of the Delta. However, under Alternative 1, proposed project facilities in the Secondary Zone of the Delta would include the new Delta Intake Facilities; most of the Delta-Transfer Pipeline; most of the Western Power Supply facilities, including a potential Western substation, under Power Option 1 (Western Only); and the portion of the Transfer-Bethany Pipeline closest to the California Aqueduct under the Eastside Option.

As previously indicated under Regulatory Setting, the Secondary Zone is not within the planning area of the Delta Protection Commission, but the Commission may comment on development projects within the Secondary Zone in the event that a project in the Secondary Zone could affect lands within the Primary Zone. Policy recommendations related to development and activities within the Secondary Zone are provided in the Land Use and Utilities and Infrastructure sections of the Management Plan. These include recommendations to minimize impacts associated with construction of transmission lines and utilities by locating new construction in existing utility or transportation corridors, or along property lines, and by minimizing construction impacts. Plan policy recommendations for minimizing the effects of project construction in this area have either already been incorporated into project siting and design considerations, or are addressed by mitigation measures identified in the EIS/EIR to reduce significant construction effects. Proposed facilities would be within existing utility corridors and/or roadways, and/or along property lines, to minimize further land fragmentation. Also, activities have been identified to address construction effects such as erosion and stormwater runoff. As a result, the project would be consistent with policies of the *Land Use and Resource Management Plan for the Delta*.

Contra Costa County General Plan

Los Vaqueros Reservoir Expansion/Dam Modifications and Recreation Facilities. The Contra Costa County General Plan designates CCWD's Los Vaqueros Watershed property as Watershed. According to the County General Plan, CCWD lands in the Watershed category include properties acquired for Los Vaqueros Reservoir in the southeastern portion of the county. The Expanded Los Vaqueros Reservoir is consistent with the Watershed designation because it is supporting protection of water supply and the existing reservoir, which is the purpose of the designation according to the County General Plan. Passive, low-intensity recreational uses such as hiking and biking; and small-scale commercial uses that support picnicking, boating, and fishing activities at the Los Vaqueros Reservoir are also recognized as consistent with Watershed designated lands.

Delta Intake and Pump Station. The new Delta Intake and Pump Station would be on land designated as Delta Recreation and Resources in the Contra Costa County General Plan. The Delta Recreation and Resources designation was created to balance the recreational opportunities in the area with the need to allow only low-intensity uses that will not subject residents or visitors to the flood dangers associated with the Delta. The new Delta Intake and Pump Station would be consistent with the Delta Recreation designation because it would not draw in a large number of workers, residents, or visitors to a flood-prone area. CCWD does not have any employees working out of its intake facilities, and does not anticipate that it would have any permanent employees working out of its intakes in the future. Also, as discussed in Section 4.5, Local Hydrology, Drainage, and Groundwater under Impact 4.5.5, the new Delta Intake and Pump Station would be located in the 500-year flood zone as defined by the Federal Emergency Management Agency (FEMA). The area is protected from the 100-year flood hazards by the existing levee along Old River. The proposed project includes improvements to the levee in the area of the new Delta Intake and Pump Station that would enhance the flood protection for this facility. An earthen setback levee (or ring levee around the site) would be installed for protection during construction and would remain as a permanent structure to provide secondary containment of Old River in the event of a flood in the area. This facility would be protected from flood flows but would not impede or redirect flood flows.

Conveyance Facilities. Under Alternative 1, project pipelines and the Transfer Facility Expansion would occur on land use areas designated as follows:

- The Delta-Transfer Pipeline would pass through lands designated as Delta Recreation, Public/Semi-Public, Agricultural Lands, and Agricultural Core.
- The Transfer Facility Expansion Area would be on lands designated as Agricultural Lands in the Contra Costa County General Plan.
- Transfer-LV Pipeline would occur on lands designated as Watershed, Agricultural Lands, and Parks and Recreation in the Contra Costa County General Plan.
- The Transfer-Bethany Pipeline would pass through lands designated as Agricultural Lands and Public/Semi-Public in the Contra Costa County General Plan.

The descriptions of each of these land use designations can be found in the Regulatory Setting section of this chapter. The Watershed, Parks and Recreation, and Public/Semi-Public designations specify that public utilities are an included use. Also, county policies indicate that allowable uses identified for lands under the Agricultural Core, Delta Recreation and Resources, Watershed, Parks and Recreation, and Open Space designations are allowed within Agricultural Lands. This includes water supply reservoirs, pipelines, and transmission lines. Furthermore, construction of underground water pipelines and a transfer facility would be consistent with the Contra Costa General Plan in the following respects:

- Because installation of water pipelines is instrumental to implementing a water supply reservoir, which is a designated use;
- Because the facilities would be publicly owned and operated (by CCWD);
- Because pipelines through agricultural and recreational areas would not preclude continued farming or recreation on the overlying land; and
- Because policies for the Southeast County Area (3-69) indicate that, subject to specific project review, pipelines and transmission lines are generally consistent with planned agricultural areas.

Power Supply. To accommodate a new Delta Intake and Pump Station as well as the expansion of the Transfer Facility, additional overhead electrical powerlines and a substation would be required. The two options for electrical facilities currently under consideration include Power Option 1 (Western Only), and Power Option 2 (Western & PG&E). Construction of Power Option 1 includes additional powerlines from the proposed site of the Western substation to the new Delta Intake and Pump Station. Under Power Option 1, a new Western substation would be sited at the eastern terminus of Camino Diablo Road. Power Option 2 would entail a new PG&E substation within the CCWD Watershed property in an area to the north of the staging area, plus a new distribution line connecting the new PG&E substation to the Expanded Transfer Facility. Most of the proposed power facilities (with the exception of a new Western substation) would occur within existing utility easements or on Watershed designated land.

Power supply overhead lines would pass through lands designated Delta Recreation, Public/Semi-Public, Agricultural Lands, Agricultural Core, and Watershed. The Western Substation would be on land designated Delta Recreation and the PG&E substation would be on land designated Watershed. For the same reasons that underground pipelines would be consistent with these Contra Costa General Plan land use designations, power supply facilities would also be consistent with the Plan. Specifically, construction of overhead powerlines and a potential Western substation (under Power Option 1) would be consistent with the Contra Costa General Plan in the following respects:

- Because installation of transmission lines is instrumental to implementing a water supply reservoir, which is a designated use;
- Because the facilities would be publicly owned and operated (by Western and PG&E);

- Because utilities passing through agricultural and recreational areas would not preclude continued farming or recreation on the overlying land; and

- Because policies for the Southeast County Area (3-69) indicate that, subject to specific project review, pipelines and transmission lines are generally consistent with planned agricultural areas.

Alameda East County Area Plan – A Portion of the Alameda County General Plan

The portion of the Transfer-Bethany Pipeline (both Westside and Eastside Options) in Alameda County is in areas designated by the Alameda ECAP as Large Parcel Agriculture and the area around Bethany Reservoir is designated as Major Parks. This area of Alameda County is also a designated Wind Resource Area overlay. The descriptions of each of these land use designations can be found in the preceding Regulatory Setting section. The pipeline would be consistent with the Large Parcel Agriculture designation because installation of an underground pipeline would not create parcels smaller than required under this designation or preclude continued agricultural use (primarily grazing) on the overlying land. The pipeline would be consistent with the Major Parks Designation because it is a public water pipeline to be connected with state water facilities within the reservoir area and would not interfere with recreational uses at the Bethany Reservoir State Recreation Area. Furthermore**,** the proposed pipeline would be consistent with the Wind Resource Overlay because installation of an underground pipeline would not interfere with existing or future wind turbine operations.

Contra Costa County Airport Land Use Compatibility Plan

Under Alternative 1, the Delta-Transfer Pipeline would be on the edge of ALUCP Compatibility Zone D. The Transfer-Bethany Pipeline would pass through several ALUCP compatibility zones in the vicinity of Byron Airport (Compatibility Zones B2, C1, C2, and D).

With respect to project consistency with ALUCP policies during long-term project operations, these pipelines would be buried, underground facilities. Because these pipelines would be underground, with only limited aboveground support structures (i.e., blow-off and air valves that stand about 2 feet above ground and are spaced about every 1,000 to 2,000 feet along the pipeline), they would be consistent with the ALUCP. Additionally, people would not be permanently placed at this location for this potential pipeline

The only major aboveground facility with the potential to be constructed near the Byron Airport would be the 69 kV electrical power transmission line, about 1.5 miles east of the runway. The transmission lines for Power Option 1 (Western Only) would pass through Compatibility Zones B1, B2, C1, and D, and a potential Western Substation would be within Compatibility Zone D. Because the potential new powerlines (anticipated to be 50 feet high) would be within an existing transmission line corridor, they would not create any new hazards to aviation or conflict with ALUCP policies. The proposed substation would be less than 50 feet tall.

S**ummary.** Alternative 1 would not conflict with any applicable land use plan adopted for the purpose of avoiding or mitigating a significant environmental effect.

Alternative 2

The land use plans and locations of facilities under Alternative 2 would be the same as described for Alternative 1. Impacts related to project compatibility with land use plans under Alternative 2 would be the same as described for Alternative 1. Facility siting and operation would be consistent with land use plans and policies.

Alternative 3

Alternative 3 would implement similar facilities as compared to Alternative 1, except that under Alternative 3, the new Delta Intake and Pump Station and the Transfer-Bethany Pipeline would not be constructed. However, it would expand the existing Old River Intake and Pump Station within that structure's existing footprint.

Land Use and Resource Management Plan for the Delta

The existing Old River Intake and Pump Station is within the Secondary Zone of the Delta. Under Alternative 3, Old River Intake and Pump Station Expansion would be consistent with the Land Use and Resource Management Plan for the Delta because the Management Plan policy recommendations for minimizing the effects of project construction in the Secondary Zone are already addressed by both the site location and by mitigation measures identified in the EIS/EIR to reduce significant construction effects. Expansion of this existing facility would occur within the existing property for this facility. The site is on and next to Old River, and expansion of the facility would not increase the overall area of the facility site or result on land fragmentation. Mitigation measures have been identified to address construction effects such as erosion and stormwater runoff. As a result, the project would be consistent with policies of the *Land Use and Resource Management Plan for the Delta*.

Contra Costa County General Plan

The existing intake facility is already on land designated in the Contra Costa County General Plan as Public/Semi-Public. The descriptions of this land use designation can be found in the preceding Regulatory Setting section. The proposed project includes on-site modifications to the Old River Intake and Pump Station that would be consistent with the Public/Semi-Public designation because the modified facility would continue to be owned and operated by a public entity, CCWD. Therefore, Alternative 3 (like Alternative 1) would be consistent with the land use designations in the Contra Costa County General Plan.

Alameda East County Area Plan – A Portion of the Alameda County General Plan

Under Alternative 3, no project facilities are in Alameda County.

Contra Costa County Airport Land Use Compatibility Plan

Under Alternative 3, the Delta-Transfer Pipeline would be on the edge of ALUCP Compatibility Zone D, the 69 kV electrical power transmission line alignment proposed under Power Option 1 (Western Only) would be about 1.5 miles east of the runway and would pass through Compatibility Zones 1, B2, C1, and D, and the proposed Western substation would be within Compatibility

Zone D. As discussed for Alternative 1, in the long term, facility siting and operation of the buried pipeline and additional power facilities in these zones around the airport would be consistent with the ALUCP policies.

In summary, facility siting and operation under Alternative 3 would be consistent with land use plans and policies.

Alternative 4

Alternative 4 would include a reduced reservoir expansion to 160 TAF; however, there would be no modifications to the Old River Intake and Pump Station, no construction of a new Delta Intake and Pump Station, and no new Conveyance or Power Supply facilities would be constructed. Modifications to Recreation Facilities would occur on lands within the CCWD Los Vaqueros Watershed property line.

Delta Management Plan

For Alternative 4, no changes are proposed to project facilities in the Secondary Zone of the Delta.

Contra Costa County General Plan

As discussed under Alternative 1, the Contra Costa County General Plan designates CCWD's Los Vaqueros Watershed property as Watershed. The Expanded Los Vaqueros Reservoir is consistent with the Watershed designation because it supports protection of water supply, which is the purpose of the designation according to the County General Plan. The only project activity under Alternative 4 that would occur beyond the CCWD Los Vaqueros Watershed property line would be at the existing CCWD Transfer Facility and would involve only an on-site pump capacity upgrade which would not change its existing land use. This would be consistent with the area's General Plan designation of Agricultural, which allows water supply pipelines.

Alameda East County Area Plan – A Portion of the Alameda County General Plan

For Alternative 4, no project facilities are in Alameda County.

Contra Costa County Airport Land Use Compatibility Plan

For Alternative 4, no proposed project facilities are within the Byron ALUCP area.

In summary, because all Alternative 4 construction would occur on property owned by CCWD and no land use changes would occur at the Transfer Facility, Alternative 4 would be consistent with all land use plans and policies.

Mitigation: None required.

Impact 4.7.3: Construction activities within designated Airport Land Use Compatibility Zones near the Byron Airport could cause potential temporary height impacts by conflicting with FAR Part 77 surfaces during construction. (Less than Significant with Mitigation for Alternatives 1, 2, and 3; Less than Significant for Alternative 4)

Alternative 1

Under Alternative 1, the Delta-Transfer Pipeline would be on the edge of ALUCP Compatibility Zone D. The Transfer-Bethany Pipeline would pass through several ALUCP compatibility zones in the vicinity of Byron Airport (Compatibility Zones B2, C1, C2, and D). The 69 kV electrical power transmission line would be constructed about 1.5 miles east of the runway. The transmission lines for Power Option 1 (Western Only) would pass through Compatibility Zones B1, B2, C1, and D, and a potential Western substation would be within Compatibility Zone D. As previously stated, new powerlines (anticipated to be up to 50 feet high) would be within an existing transmission line corridor and would not create any new hazards to aviation or conflict with ALUCP policies after construction.

As identified in ALUCP policies 6.3.4, 6.4.4, 6.5.4, 6.6.4, and 6.7.4, specific height restrictions are in place for Areas B1 (35 feet), B2 (70 feet), and C1, C2, and D (100 feet). However, it is important to note that these measurements refer to the difference between the height of the proposed object and the height of the runway end. Changes in topography could lead to variations in the allowable height of proposed objects based on the location.

Project construction will involve the use of cranes, drills, or other large construction equipment as tall as the lines that are being upgraded that have the potential to intrude into protected airspace (i.e., 35 feet or above). In addition, the location of these objects during equipment staging while they are not in use must be considered with respect to height restrictions and ALUCP policies. For example, the location of cranes and other equipment may require the use of lighting or other marking during nighttime hours, especially during the construction of the transmission line.

In summary, Alternative 1 would result in impacts related to construction within protected airspace associated with Byron Airport. This would be a significant impact.

Alternative 2

The facilities under Alternative 2 would be the same as described for Alternative 1. Impacts related to construction within protected airspace associated with Byron Airport under Alternative 2 would be the same as described for Alternative 1. Alternative 2 would have significant impacts related to construction within protected airspace associated with Byron Airport.

Alternative 3

Alternative 3 would implement similar facilities as under Alternative 1, except that Alternative 3 would not construct the new Delta Intake and Pump Station or the Transfer-Bethany Pipeline but would expand the existing Old River Intake and Pump Station within that structure's existing footprint. Pipeline, power supply, and other construction would occur in or near Byron Airport

Land Use Compatibility Zones. Alternative 3 would have significant impacts related to construction within protected airspace associated with Byron Airport.

Alternative 4

Alternative 4 would include a reduced reservoir expansion to 160 TAF; there would be no construction within the Byron Airport Land Use Compatibility Zones. Alternative 4 would have a less-than-significant impact related to construction within protected airspace associated with Byron Airport.

Mitigation Measure

Measure 4.7.3: Pursuant to ALUCP policy 4.3.4, CCWD shall notify the FAA, as required by FAR Part 77, Subpart B, of its proposed project to determine whether the proposed construction equipment and the location of construction activities and staging areas have the potential to intrude into protected airspace associated with Byron Airport. To facilitate FAA coordination, CCWD shall consult with County Airport staff. If necessary, CCWD will ensure that appropriate notes or modifications are made on all applicable design plans and specifications to ensure that construction activities would not conflict with the airport height limitations.

Impact Significance after Mitigation: Less than Significant.

Impact 4.7.4: Construction activities within the AIA for Byron Airport could cause potential temporary flight hazards through the creation of glare or distracting lights; the generation of dust or smoke, which could impair pilot visibility; or could attract an increased number of birds. (Less than Significant with Mitigation)

Alternative 1

Alternative 1 has the potential to create glare or distracting lights in the vicinity of Byron Airport through the illumination of staging and equipment storage areas or work areas next to roadways, such as Vasco Road, Walnut Boulevard, and Bixler Road. ALUCP county policies prohibit land uses that would create potential hazards to flight.

Alternative 1 would include the expansion of the Los Vaqueros Reservoir, which will include excavation, soil stockpiles, sediment and erosion control, and re-vegetation measures. Similar construction activities will be associated with other project components within Alternatives 1 through 3 (i.e., excavation of tunnel portals, pipeline transfer facilities, pump station construction, etc.) ALUCP countywide policy 4.3.6 cites these opportunities as specific characteristics that should be avoided within the AIA, and airport-specific policy 6.9.3 prohibits land uses that would result in an increased attraction of birds or would create a visual or electronic hazard to flights. FAA Advisory Circular 150/5200-33A, “Hazardous Wildlife Attractants on and near Airports” also warns against the creation of open water and other wildlife attractions within 5 statute miles of airports that support piston-powered aircraft.

Soil excavation and the creation of soil stockpiles can result in the generation of dust that could obscure pilot views during construction. The stabilization of excavated areas and soil stockpiles through the use of standard sediment and erosion control seed mixtures can also reduce the generation of dust, but such mixtures frequently include grains and other constituents that can serve as food sources for birds and other potentially hazardous wildlife. In addition, the creation of temporary sediment and erosion control ponds or other temporary open water facilities can attract avian wildlife by providing areas for nesting and loafing.

In summary, Alternative 1 would result in construction activities within the AIA for Byron Airport that could cause temporary flight hazards. This would be a significant impact.

Alternative 2

The facilities under Alternative 2 would be the same as described for Alternative 1. Impacts related to construction activities that could cause temporary flight hazards for Byron Airport under Alternative 2 would be the same as described for Alternative 1. Alternative 2 would have significant impacts.

Alternative 3

Alternative 3 would implement facilities similar to those of Alternative 1, except that Alternative 3 would not construct the new Delta Intake and Pump Station or the Transfer-Bethany Pipeline but would expand the existing Old River Intake and Pump Station within that structure's existing footprint. Alternative 3 pipeline, power supply, and other construction would occur in or near Byron Airport Land Use Compatibility Zones. Alternative 3 would have significant impacts related to construction activities that could cause temporary flight hazards for Byron Airport.

Alternative 4

Alternative 4 would include a reduced Reservoir Expansion to 160 TAF; although there would be no construction within the Byron Airport Land Use Compatibility Zones, Alternative 4 construction lighting, soil excavation, and activities that would attract avian wildlife (such as the revegetation seed mix for the 160 TAF borrow area), could result in flight-related hazards. Alternative 4 would have significant impacts related to construction activities that could cause temporary flight hazards for Byron Airport.

Mitigation Measures

Measure 4.7.4a: During project design, CCWD shall consult with Contra Costa County Airport staff regarding the location of illuminated equipment staging, storage, and construction areas, and the need to provide a potential Notice to Airmen (NOTAM) during construction activities. CCWD shall instruct its engineer to make appropriate notations on construction drawings and specifications to indicate that illuminated work areas shall incorporate the use of downward facing lights with amber lumens to prevent confusion to pilots.

Measure 4.7.4b: During project design, CCWD shall instruct its engineer to prohibit the use of temporary sediment ponds that could create open water to attract potentially hazardous

wildlife. To ensure that an appropriate seed mixture is used during construction, CCWD shall instruct its engineer to make appropriate notations on construction drawings and specifications to indicate that all seed mixtures used for revegetation or for sediment and erosion control purposes should not contain rice, barely, millet, rye, or other potential food sources for avian wildlife.

Measure 4.10.1: During construction, CCWD will require the construction contractor to implement the Bay Area Air Quality Management District's (BAAQMD's) basic and enhanced dust control procedures (see Section 4.10, Air Quality).

Impact Significance after Mitigation: Less than Significant.

Impact 4.7.5: The proposed project and alternatives would not contribute to cumulative land use impacts. (No Impact)

Impacts involving land use plans or policies would not combine to result in cumulative impacts. The determination of significance for impacts related to these issues is whether a project would conflict with any applicable land use plan or policy adopted for the purpose of reducing or avoiding environmental impacts. Such a conflict is site specific and would be addressed on a project-by-project basis. As described above, implementing the proposed alternatives would not conflict with any land use plan, including any airport land use plan and policies, adopted for the purpose of avoiding or mitigating a significant environmental effect. Similarly, construction siting, or operation of any of the proposed project facilities under any of the project alternatives would not physically divide a community. Thus, the project would not contribute to any significant cumulative land use impacts.

Mitigation: None required.

4.8 Agriculture

This section addresses issues related to agricultural resources that may be affected by the Los Vaqueros Reservoir Expansion Project. This section begins with a discussion of the regulatory setting established by applicable federal, state, local, and regional plans and programs. The Environmental Setting subsection describes the local agricultural activities and state farmland designations for lands in the project area. The subsection on Environmental Consequences discusses the impacts attributable to the project alternatives, defines the criteria used in determining impact significance, and, where necessary, discusses feasible mitigation measures. Economic effects of changes in agricultural crop production are discussed in Section 4.17, Socioeconomic Effects.

4.8.1 Affected Environment

Regulatory Setting

Federal

Farmland Protection Policy Act

Congress passed the Farmland Protection Policy Act (FPPA) in 1981 as part of the Farm Bill. Its purpose is to minimize unnecessary conversion of farmland to nonagricultural uses as a part of federal programs. The Farmland Protection Policy Act established the Farmland Protection Program (FPP) and a Land Evaluation and Site Assessment system (LESA).[1] The Natural Resources Conservation Service administers the FPP, which is a voluntary program that provides funds to help purchase development rights to keep productive farmland in agricultural use. The program provides matching funds to state, local, and tribal government entities, and nongovernmental organizations with existing farmland protection programs to purchase conservation easements. Participating landowners agree not to convert the land to nonagricultural uses and to retain all property rights for future agriculture. A minimum 30-year term is required for conservation easements, and priority is given to applications with perpetual easements. The Natural Resources Conservation Service provides up to 50 percent of the fair market value of the easement (NRCS, 2008).

The federal LESA system is a tool used to rank lands for suitability and inclusion in the FPP. The federal LESA uses a Farmland Conversion Impact Rating (FCIR) form (Form AD-1006) to establish an FCIR score. The system evaluates several factors, including soil potential for agriculture, location, market access, and adjacent land use. These factors are used to rank land parcels for inclusion in the FPP based on local resource evaluation and site considerations (NRCS, 2008). The FCIR form can also be used to assess a project's impact to agricultural lands, and was used in this impact analysis.

[1] The federal Land Evaluation and Site Assessment system uses the same acronym, LESA, as is used by the California Department of Conservation farmland evaluation and site assessment program.

State

California Important Farmland Inventory System and Farmland Mapping and Monitoring Program

The California Department of Conservation, Division of Land Resource Protection, maintains the Farmland Mapping and Monitoring Program (FMMP) and monitors the conversion of farmland to and from agricultural use through its Important Farmland Inventory System. Farmlands are divided into the following categories based on their suitability for agriculture:

- **Prime Farmland.** This land has the best combination of physical and chemical characteristics for crop production. When treated and managed, its soil quality, growing season, and irrigation supply produce sustained high crop yields.
- **Unique Farmland.** This land does not meet the criteria for Prime Farmland or Farmland of Statewide Importance, but has produced specific crops with high economic value.
- **Farmland of Statewide Importance.** This is land other than Prime Farmland that has a good combination of physical and chemical characteristics, including irrigation, for crop production.
- **Farmland of Local Importance.** This land is either currently producing crops or has the capability to produce, but does not meet the criteria of the categories above.
- **Grazing Land.** This is land whose vegetation is suitable for grazing livestock.
- **Other Lands.** This land does not meet the criteria of any of the other categories.

Additional categories used in the FMMP mapping system are "urban and built-up lands," and "lands committed to nonagricultural use." The mapping system uses a minimum mapping unit size of 10 acres.

FMMP classifications are based on soil quality and irrigation status (FMMP, 2007). They differ from general plan designations and zoning because they are used to evaluate the type and amount of farmlands, rather than to designate land-use type or place restrictions on development or use. Instead, the FMMP uses these designations as part of its neutral reporting program that classifies land based on its suitability for agriculture. The FMMP also produces a biannual report on the amount of land converted from agricultural to nonagricultural use.

Williamson Act

Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), local governments are empowered to establish "agricultural preserves" consisting of lands devoted to agricultural uses and other compatible uses. After establishing these preserves, the public agency, generally a county, may offer to owners of included agricultural land the opportunity to enter into annually renewable contracts that restrict the land to agricultural use for at least 10 years. In return for maintaining agricultural or open-space use of their lands, landowners receive reduced property tax assessments. The contract is self-renewing and the landowner may notify the county at any time of intent to withdraw the land from its preserve status. Withdrawal involves a 10-year period of tax adjustment to full market value before

protected open space can be converted to urban uses. Williamson Act contracts can be cancelled earlier than the 10-year period upon approval of the appropriate local jurisdiction, which must make findings that cancellation is in the public interest or is consistent with the purposes of the California Land Conservation Act. Generally, the landowner must also pay a fee equal to 12½ percent of the property value.

Contra Costa County's Land Conservation Program Questions and Answers booklet (Contra Costa County, 2003) provides the following information about the use of contracted farmlands for land acquisition by a public agency:

> When any action in eminent domain for the condemnation of the fee title of an entire parcel of land subject to an agreement is filed, or when land is acquired in lieu of eminent domain for a public improvement by a public agency, the contract shall be deemed null and void as the land actually being condemned or acquired. If the action for condemnation or acquisition is abandoned by the public agency, the restrictions on the land and the agreement will be reinstated.

Therefore, any Williamson Act lands acquired for the Los Vaqueros Reservoir Expansion project would make the applicable Williamson Act contract(s) null and void.

The location of Williamson Act lands within the proposed project area that may be affected by the project is described under Impact 4.8.3.

Delta Management Plan

The Delta Protection Act of 1992 established the Delta Protection Commission, a state entity created to plan for and guide the conservation and enhancement of the Delta's natural resources while also sustaining agriculture and meeting increased recreational demand (California Public Resources Code, Sections 29700 et seq.). The Delta Protection Act defines a Primary Zone, which comprises the principal jurisdiction of the Delta Protection Commission. No project facilities are proposed to be sited within the Primary Zone (Delta Protection Commission, 1995).

The Secondary Zone is the area outside the Primary Zone and within the "Legal Delta." The Secondary Zone is not within the planning area of the Delta Protection Commission, but the commission may comment on development projects within this area. A number of proposed project components, including the New Delta Intake and Pump Station, and portions of the Delta-Transfer Pipeline, are within the Secondary Zone of the Delta Management Plan. Section 4.7, Land Use, of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR) provides a more comprehensive discussion of the Delta Management Plan; the plan is not discussed further in this section.

Local

Contra Costa County General Plan

The Contra Costa County General Plan identifies goals, policies, and implementation measures related to the preservation of agricultural uses (Contra Costa County, 2005a). These goals and policies include protection and enhancement of the agricultural economy (Goal 8-6), conservation

of prime productive agricultural lands (Goal 8-H), and protection and enhancement of agricultural operations to retain designated areas in agricultural use (Policy 8-38) (Contra Costa County, 2005a). See Appendix E-2 for the text of these goals and policies relevant to agricultural resources.

Alameda East County Area Plan

The Alameda East County Area Plan is a segment of the countywide general plan and presents Alameda County's policies for future development and resource conservation within East Alameda County. The Alameda East County Area Plan identifies the portion of the proposed project within Alameda County (portions of the Transfer-Bethany Pipeline) as large-parcel agriculture. This area is outside of the Urban Growth Boundary and is also designated as a wind resource area. Policies related to agricultural resources address the following relevant issues:

- Conserving prime soils and Farmland of Statewide Importance and Unique Farmland outside of the Urban Growth Boundary (Policy 71)
- Buffering between agricultural use areas and nonagricultural areas (Policy 73)
- Enforcing the Alameda County Right-to-Farm Ordinance on all lands within and next to agricultural areas (Policy 75)
- Ensuring that development next to Alameda County agricultural land mitigates impacts on agricultural land (Policy 76) (Alameda County, 2002)

See Appendix E-1 for a description of specific goals and policies related to agricultural resources.

Right-to-Farm Ordinances

Both Contra Costa County (Contra Costa County Code, Title 8, Chapter 820-2) and Alameda County (Alameda County, Code Chapter 6.28) have established "Right-to-Farm" ordinances designed to protect and promote agricultural activities, especially at the urban/agriculture interface. For the most part, a Right-to-Farm ordinance is designed to protect farmland by requiring disclosure to purchasers and users of property next to or near agricultural operations of the inherent potential problems associated with living near actively farmed land. Such concerns include, but are not limited to, the noise, odors, dust, chemicals, smoke, and hours of operation that may accompany agricultural operations. It is intended through such mandatory disclosures that purchasers and users will better understand the impact of living near agricultural operations and be prepared to accept the naturally resulting attendant conditions.

While implementation of the project alternatives would place nonagricultural (i.e., public utility) uses in and near lands designated for agricultural use, the Right-to-Farm ordinance with its mandatory disclosures and deed restrictions is not considered applicable for purchase of land for proposed water utility structures, pipelines, and power supply facilities. This is because any lands the Contra Costa Water District acquires for the project would not involve persons residing on or near agricultural land; therefore Right-to-Farm ordinances will not be discussed further in this section.

Environmental Setting

The majority of the eastern portion of Contra Costa and Alameda Counties consists of lands designated for open space, agricultural uses, and related activities such as feed mills, dairies, and farm residences. Most of the designated agricultural area is used for grazing rather than for growing crops. Livestock grazing activities are found on upland areas where the topography is relatively steep and local surface or groundwater supplies are limited. Irrigated farming, used for orchards and field crops, occurs on properties to the north and east of Los Vaqueros Reservoir, on low-lying southeast Contra Costa County lands of the Delta.

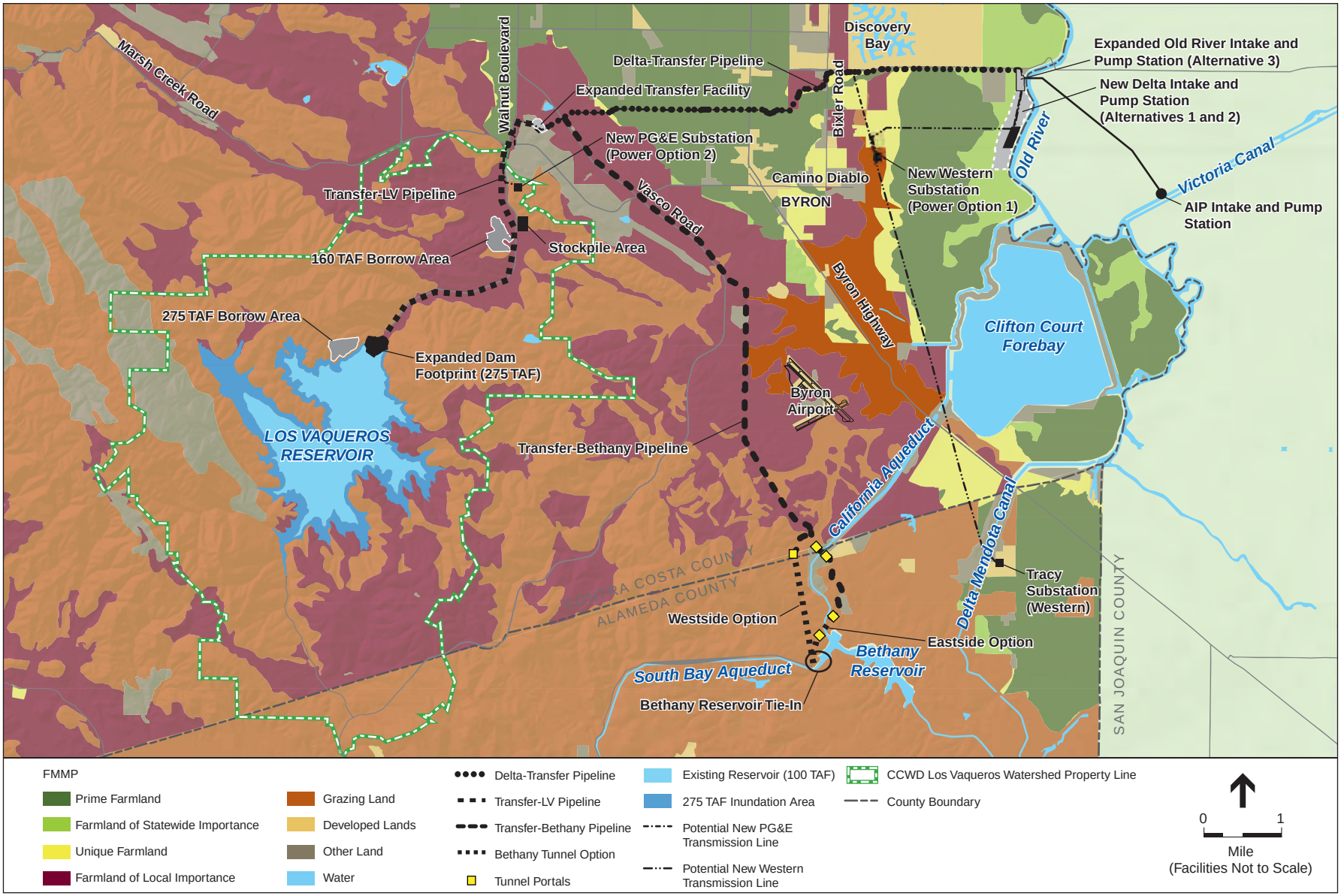
Important Farmland in the Project Area

Figure 4.8-1 shows FMMP classifications for land in the project vicinity. **Figure 4.8-2** shows those lands under Williamson Act contract in the project area. The following is a review by project facility of the designated FMMP farmlands that occur on or near proposed project sites. Also indicated are lands under Williamson Act contract; a more complete discussion of Williamson Act lands is found under Impact 4.8.3. Further information on each project facility, including the type and number of acres of agricultural land affected, are more fully described in subsection 4.8.2, Environmental Consequences, below.

Reservoir Expansion. The CCWD watershed property includes land designated under the FMMP as Farmland of Local Importance, Grazing Land, or Other Lands. No CCWD properties fall under Williamson Act contract, and the reservoir expansion does not affect any contracted lands. Although much of the CCWD watershed property is used for grazing, the purpose of the grazing is for habitat management. As mitigation for construction of the existing Los Vaqueros Reservoir, the CCWD watershed lands are managed for kit fox habitat as defined by the Biological Opinion (BO) for the existing reservoir. Land management activities include grazing cattle and sheep on large portions of CCWD property (about 10,000 acres) to provide 800 to 1,200 pounds of forage per acre as specified by the BO.

Intake Facilities. The new Delta Intake and Pump Station would be sited on land designated Farmland of Statewide Importance. The existing Old River Intake and Pump Station is also on land designated Farmland of Statewide Importance, however, no property beyond the existing facility boundaries is proposed for use. None of the properties to be affected by construction of new or expansion of existing intake facilities are under Williamson Act contract.

Conveyance Facilities. The eastern portion of the Delta-Transfer Pipeline extends through areas of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. The western portion of the Delta-Transfer Pipeline and the Transfer-LV Pipeline would occur primarily on Grazing Land and Farmland of Local Importance. The Transfer Facility expansion would occur on land designated as Farmland of Local Importance. The Transfer-Bethany Pipeline would primarily pass through lands designated Farmland of Local Importance and, to a lesser degree, Grazing Land. The project components that are near or pass through land subject to Williamson Act contracts include portions of all three water-conveyance pipelines (Delta-Transfer Pipeline, Transfer-LV Pipeline, Transfer-Bethany Pipeline (Westside and Eastside Options) and the expanded Transfer Facility property.



SOURCE: USGS, 1993 (base map); California Department of Conservation, FMMP, 2001; and ESA, 2008

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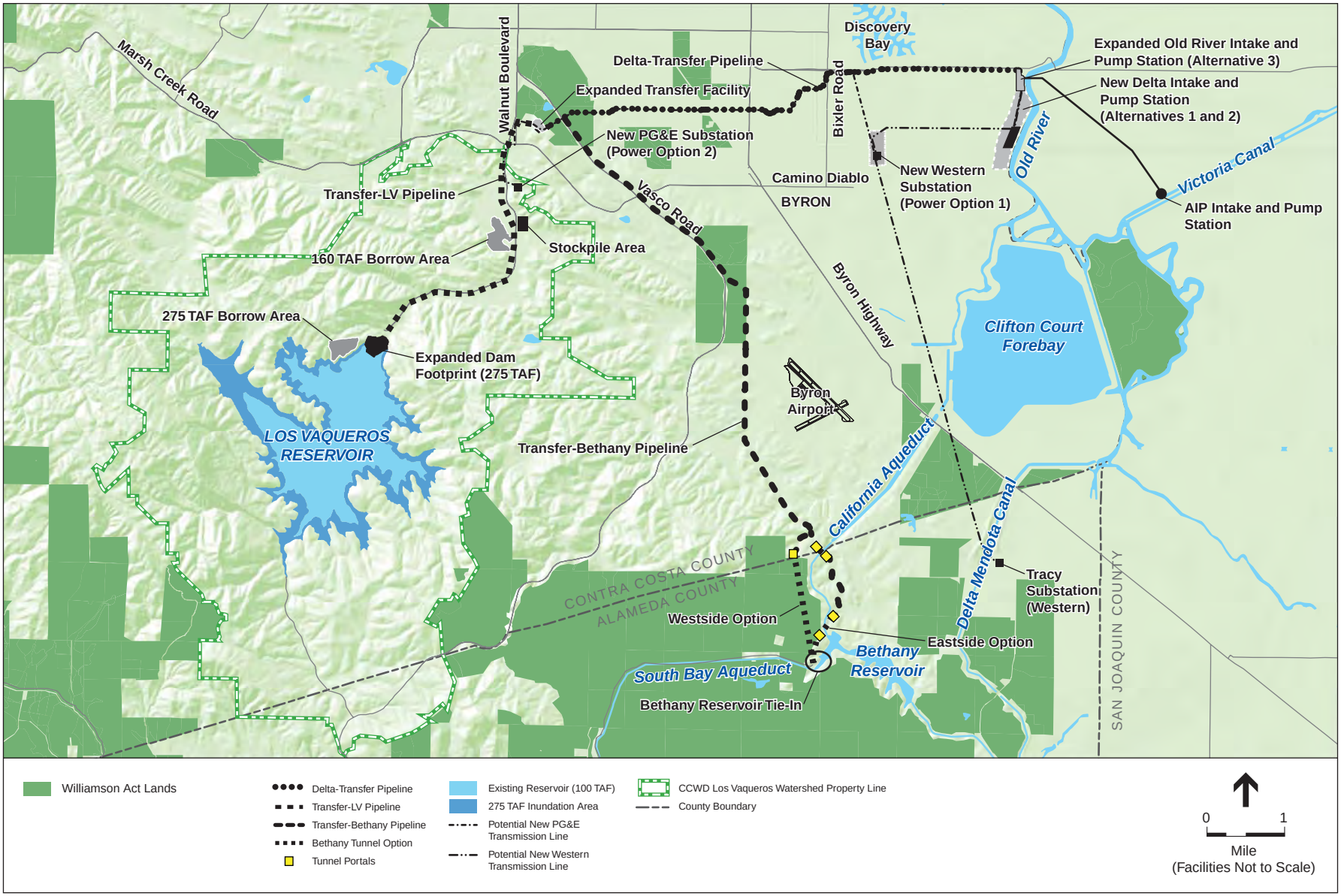
Figure 4.8-1
Important Farmlands



SOURCE: USGS, 1993 (base map); and ESA, 2008

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Figure 4.8-2

Williamson Act Contract Lands

Power Supply Facilities. Under Power Option 1 (Western Only), the proposed Western Area Power Administration (Western) substation and its access road would occur on lands designated as Unique Farmland and/or Grazing Land. The power supply would be increased by using an existing 230 kilovolt (kV) transmission line that traverses from Western's Tracy Substation to a new substation site. From the new substation site, lines would be upgraded and connect with one or both intakes near Old River, passing through lands designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. To the west, near the existing Transfer Station, existing and proposed transmission lines would pass through lands designated as Prime Farmland, Farmland of Local Importance, and Other Lands.

Under Power Option 2 (Western & Pacific Gas and Electric Company [PG&E]), the proposed PG&E substation and its access road would occur on lands designated as Grazing Land. Proposed transmission lines would connect with one or both intakes along Old River, passing through lands designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland as well as Grazing Land, Farmland of Local Importance, and Other Lands. To the west, near the existing Transfer Station, existing and proposed transmission lines would pass through lands designated as Prime Farmland, Farmland of Local Importance, and Other Lands.

Recreation Facilities. Within the CCWD watershed property, areas planned for the Marina Complex, Interpretive Center, Trails/Access, and Other Facilities are all designated as Farmland of Local Importance, Grazing Land, or Other Lands. No CCWD properties fall under Williamson Act contract, and the proposed recreation facilities would not affect any contracted lands.

Farmland Conversion

Table 4.8-1 and **Table 4.8-2** provide a summary of recent changes to agricultural land within Contra Costa and Alameda Counties, respectively. Both counties experienced a net loss of agricultural land between 2004 and 2006. In both Contra Costa and Alameda Counties, the most significant net losses were in Prime Farmland.

TABLE 4.8-1
RECENT FARMLAND CONVERSIONS IN CONTRA COSTA COUNTY

Land Use Category	Total Acres Inventoried		2004–2006 Acreage Changes		
	2004	2006	Acres Lost	Acres Gained	Net Loss
Prime Farmland	32,024	29,938	2,523	437	2,086
Farmland of Statewide Importance	8,547	8,092	1,063	608	455
Unique Farmland	3,929	3,589	716	376	340
Farmland of Local Importance	52,257	52,071	2,083	1,897	186
Grazing Land	168,783	168,662	357	236	121
Agricultural Land Subtotal	**265,540**	**262,352**	**6,742**	**3,554**	**3,188**

SOURCE: California Department of Conservation, Division of Land Resource Protection, 2008 (Table A-4).

TABLE 4.8-2
RECENT FARMLAND CONVERSIONS IN ALAMEDA COUNTY

Land Use Category	Total Acres Inventoried		2004–2006 Acreage Changes		
	2004	2006	Acres Lost	Acres Gained	Net Loss
Prime Farmland	5,383	4,725	666	8	658
Farmland of Statewide Importance	1,505	1,391	122	8	114
Unique Farmland	2,377	2,323	179	125	54
Farmland of Local Importance[a]	N/A	N/A	N/A	N/A	N/A
Grazing Land	244,975	244,947	760	732	28
Agricultural Land Subtotal	**254,240**	**253,386**	**1,727**	**873**	**854**

[a] Under the Farmland Mapping and Monitoring Program, each county may designate certain lands as Farmland of Local Importance. Alameda County does not provide for this designation.

SOURCE: California Department of Conservation, Division of Land Resource Protection, 2008 (Table A-1).

4.8.2 Environmental Consequences

Methodology

Important Farmlands, defined as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, are identified using data from the California Department of Conservation FMMP. Farmland of Local Importance, Grazing Land, and Other Lands are also mapped to provide agricultural land-use context and disclosure. The project alternatives are analyzed for their potential to temporarily impact Important Farmland during construction, or to permanently convert Important Farmlands to nonagricultural uses. Potential conflicts with agricultural zoning designations, potential incompatibility with a Williamson Act contract, or other changes resulting from project implementation that would remove Important Farmlands from agricultural production are also discussed. Section 4.17, Socioeconomic Effects, addresses the economic effects of permanently and temporarily converting Important Farmland to nonagricultural use and of temporarily disrupting farming activities at the proposed facility sites.

Significance Criteria

The significance criteria used in this analysis has been developed from criteria presented in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. These criteria also encompass factors taken into account under the National Environmental Policy Act (NEPA) to determine the significance of an action in terms of its context and the intensity of its effects. The project alternatives would result in a significant impact on agricultural resources if they result in any of the following:

- Permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Important Farmland, collectively) to nonagricultural use, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency
- Conflict with existing zoning for agricultural use or a Williamson Act contract

- Involve other changes in the environment that, because of their location or nature, could individually or cumulatively result in the conversion of Important Farmland to nonagricultural uses

Impact Summary

Table 4.8-3 provides a summary of the impact analysis for issues related to agricultural lands and activities.

TABLE 4.8-3
SUMMARY OF IMPACTS – AGRICULTURE

Impact	Project Alternatives			
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
4.8.1: Project construction would temporarily impact the agricultural use of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.	LSM	LSM	LSM	LS
4.8.2: The project would permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use.	SU	SU	LSM	LS
4.8.3: The project would not conflict with zoning for agricultural use or a Williamson Act contract.	LS	LS	LS	NI
4.8.4: The project would involve changes in the environment that, due to their location or nature, could contribute to cumulative impacts from conversion of Important Farmland to nonagricultural uses.	SU	SU	LSM	LS

NOTES:
SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact

Impact Analysis

No Project/No Action Alternative

Under the No Project/No Action Alternative, no new facilities would be constructed, and no changes in CCWD facilities or operations would occur that would directly or indirectly convert Important Farmland to nonagricultural use or otherwise affect the continued use of agricultural lands for agricultural production. Therefore, this alternative would have no impact on agriculture.

Impact 4.8.1: Project construction would temporarily impact the agricultural use of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. (Less than Significant with Mitigation for Alternatives 1, 2, and 3; Less than Significant for Alternative 4)

Overview – All Alternatives

Project construction activities would cause short-term disturbance of agricultural lands during all or part of the approximately 3-year project-construction period. Construction activities could cause direct disturbance to agricultural lands or indirectly disrupt agricultural lands and

activities through disruption of irrigation systems, soil compaction affecting drainage, dewatering, and dust generation.

Construction dewatering of the pipeline trench could also affect agricultural drainage in fields next to the pipeline construction. Dewatering operations would be designed to maximize dewatering in the immediate area of the trench and minimize the amount of "drawdown" in areas outside the trench. Drawdown inside and outside the trench construction area would be temporary; the affected land could be returned to agricultural use after construction has ended.

In addition to the temporary direct disturbance of land, construction activities could indirectly affect agricultural operations on adjacent lands. Temporary impacts to farming activities may extend slightly beyond the easement to provide temporary farming access roads, temporary relocation of irrigation and drainage ditches, and/or turn rows for equipment maneuvering. Construction across agriculture fields for pipeline and power supply construction could also isolate areas and render them too small to effectively or economically farm during construction.

The farmland acreages that would be disturbed during construction are listed by project component in **Table 4.8-4** and by project alternative in **Table 4.8-5**. Because two electrical supply options (Power Options 1 and 2) exist for power facility constructions and two possible southern end alignments are possible for the Transfer-Bethany Pipeline (Westside and Eastside Options), Table 4.8-5 shows the land acreage affected for each major project component, and lists impacts associated with the alternative alignments and the power supply options. Therefore, a total number of affected acres for each alternative must be determined by adding the selected alignment and the selected power option, rather than by totaling all components in a column. As is discussed in Impact 4.8.2, short-term construction will not create any permanent loss of agricultural land in the estimated acreages because of the facility siting.

Alternative 1

Under Alternative 1, construction activities would temporarily affect land that is currently under cultivation or used as grazing land during all or part of the estimated 3-year construction period. As described above, construction would interfere with agriculture in both direct and indirect ways.

Los Vaqueros Reservoir and Dam Modifications

During construction of the Los Vaqueros Reservoir Expansion, raising the dam and constructing Appurtenant Facilities would have no temporary effect on Important Farmland or Other Farmlands.

Delta Intake Facilities

Construction of the new Delta Intake and Pump Station would temporarily affect up to 22.5 acres of Farmland of Statewide Importance. This temporary impact area would include the pipeline and power transmission line alignment to connect the new Delta Intake with the existing Old River Intake and Pump Station. Within the affected area, agricultural activities would be discontinued temporarily for about 12 months. This temporarily affected area does not include the permanent loss of agricultural acreage that would occur at the new Delta Intake and Pump Station Facility site (discussed in Impact 4.8.2).

TABLE 4.8-4
TEMPORARY IMPACTS ON FARMLAND RESOURCES BY PROPOSED PROJECT COMPONENTS

	IMPORTANT FARMLAND (in acres)				OTHER FARMLAND (in acres)			
	Prime Farmland	**Unique Farmland**	**Farmland of Statewide Importance**	***SUBTOTAL: IMPORTANT FARMLAND***	**Farmland of Local Importance**	**Grazing Land**	**Other Lands**	**TOTAL FARMLAND**
Los Vaqueros Reservoir Expansion/Dam Modification								
Dam Raise and Inundation - 275 TAF (Alts 1, 2, and 3)	0	0	0	***0***	0	0	0	**0**
Dam Raise and Inundation -160 TAF (Alt 4)	0	0	0	***0***	0	0	0	**0**
Delta Intake Facilities								
New Delta Intake and Pump Station (Alts 1 and 2)	0	0	22.5	***22.5***	0	0	1.5	**24**
Old River Intake and Pump Station Expansion (Alt 3)	0	0	0	***0***	0	0	0	**0**
Conveyance Facilities								
Delta-Transfer Pipeline (Alts 1, 2, and 3)	75.5	20	14	***109.5***	36	0	10	**155.5**
Transfer Facility Expansion (Alts 1, 2, and 3)	0	0	0	***0***	0	0	8	**8**
Transfer-LV Pipeline (Alts 1, 2, and 3)	0	0	0	***0***	70.5	0.5	8	**79.00**
Transfer –Bethany Pipeline Main (Alts 1 and 2)	0	0	0	***0***	209	16	6	**231**
Westside Option (Alts 1 and 2)	0	0	0	***0***	0.5	18	0	**18.5**
Eastside Option (Alts 1 and 2)	0	0	0	***0***	0.5	33	12	**45.5**
Spoils Disposal - 275 TAF	0	0	0	***0***	7.5	3	0	**10.5**
Stockpile Area	0	0	0	***0***	6.5	8.5	0	**15**
Power Supply								
Power Option 1: Western Only (Alts 1, 2 and 3)	15	19	5	***39***	4	15.5	3	**61.5**
Power Option 2: Western & PG&E (Alts 1, 2 and 3)	0	0	0	***0***	12	8	2.5	**22.5**
Recreation Facilities								
Marina Complex (Alts 1, 2 and 3)	0	0	0	***0***	0	0	0	**0**
Marina (Relocation - Alt 4)	0	0	0	***0***	0	0	0	**0**
Hiking Trails/Access (Alts 1, 2 and 3)	0	0	0	***0***	4	21.5	0.5	**26**
Hiking Trails/Access (Alt 4)	0	0	0	***0***	5.0	18.5	0	**23.5**
Other Facilities - Piers, Picnic Areas, Restrooms, Parking (Alts 1, 2 and 3)	0	0	0	***0***	0	1	0	**1**
Other Facilities - Piers, Picnic Areas, Restrooms, Parking (Alt 4)	0	0	0	***0***	0	1	0	**1**

NOTE: Important Farmland is composed of Prime Farmland, Unique Farmland and Farmland of Statewide Importance

Alt = Alternative PG&E = Pacific Gas and Electric Company TAF = thousand acre-feet Western = Western Area Power Administration

TABLE 4.8-5
TEMPORARY IMPACTS ON FARMLAND RESOURCES BY PROPOSED PROJECT ALTERNATIVES

	IMPORTANT FARMLAND* (in acres)				OTHER FARMLAND (in Acres)			
	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	*SUBTOTAL: IMPORTANT FARMLAND*	Farmland of Local Importance	Grazing Land	Other Lands	TOTAL FARMLAND
Alternative 1 - 275 TAF								
Dam Raise and Inundation	0	0	0	***0***	0	0	0	**0**
New Delta Intake and Pump Station	0	0	22	***22***	0	0	1.5	**23.5**
Conveyance	76	20	14	***110***	330	28.5	32	**500.5**
Westside Option	0	0	0	***0***	0.5	18	0	**18.5**
Eastside Option	0	0	0	***0***	0.5	33	12	**45.5**
Power Option 1: Western Only	15	19	5	***39***	4	15	3	**61**
Power Option 2: Western & PG&E	0	0	0	***0***	12	8	2.5	**22.5**
Recreation Facilities	0	0	0	***0***	4	22.5	0.5	**27**
Alternative 2 - 275 TAF								
Dam Raise and Inundation	0	0	0	***0***	0	0	0	**0**
New Delta Intake and Pump Station	0	0	22	***22***	0	0	1.5	**23.5**
Conveyance	76	20	14	***110***	330	28.5	32	**500.5**
Westside Option	0	0	0	***0***	0.5	18	0	**18.5**
Eastside Option	0	0	0	***0***	0.5	33	12	**45.5**
Power Option 1: Western Only	15	19	5	***39***	4	15	3	**61**
Power Option 2: Western & PG&E	0	0	0	***0***	12	8	2.5	**22.5**
Recreation Facilities	0	0	0	***0***	4	22.5	0.5	**27**
Alternative 3 - 275 TAF								
Dam Raise and Inundation	0	0	0	***0***	0	0	0	**0**
Old River Intake and Pump Station Expansion	0	0	0	***0***	0	0	0	**0**
Conveyance	76	20	14	***110***	113.5	9	26	**258.5**
Power Option 1: Western Only	15	19	5	***39***	4	15	3	**61**
Power Option 2: Western & PG&E	0	0	0	***0***	12	8	2.5	**22.5**
Recreation Facilities	0	0	0	***0***	4	22.5	0.5	**7**
Alternative 4 - 160 TAF								
Dam Raise and Inundation	0	0	0	***0***	0	0	0	**0**
Recreation Facilities	0	0	0	***0***	5	19.5	0	**24.5**

NOTE: Acres are approximate; will be calculated based on final design

PG&E = Pacific Gas and Electric Company TAF = thousand acre-feet Western = Western Area Power Administration

* Important Farmland is composed of Prime Farmland, Unique Farmland and Farmland of Statewide Importance

Conveyance Facilities

A construction easement up to 200 feet wide has been evaluated for the Delta-Transfer Pipeline and the Transfer-LV Pipeline. A construction easement 300 feet wide is evaluated for the Transfer-Bethany Pipeline (see Figure 3-22). Although not of all the construction easement for each pipeline would occur within active farmland, the impact to agricultural acreage is calculated on the full width of the construction easement in order to provide a conservative impact analysis. The assumption being made is that pipeline construction could affect agricultural lands for 6 to 12 months depending on the nature of the construction and timing of site restoration.

Delta-Transfer Pipeline. Construction of this pipeline within a 200-foot wide construction easement would cause short-term disruption of up to 76 acres of Prime Farmland, 20 acres of Unique Farmland, and 14 acres of Farmland of Statewide Importance, totaling about 110 acres of Important Farmland. About 46 acres of temporarily affected Other Farmland include 36 acres of Farmland of Local Importance and 10 acres of Other Lands.

Transfer Facility Expansion. Construction of the Transfer Facility Expansion would not affect any Important Farmlands but would temporarily affect about 8 acres of Other Lands. This area could be disturbed for up to 3 years since both the Delta-Transfer Pipeline and Transfer-LV Pipeline would tie into this facility.

Transfer-LV Pipeline. Construction of the Transfer–LV Pipeline would not affect any Important Farmlands but would result in short-term impacts to about 71 acres of Farmland of Local Importance, less than 1 acre of Grazing Land, and 8 acres of Other Lands, totaling about 80 acres of Other Farmland.

Transfer-Bethany Pipeline. Construction of the Transfer–Bethany Pipeline, within a construction easement measuring up to 300 feet wide, up to the junction with the two southern alignment options, would not affect any Important Farmlands but would result in impacts to 209 acres of Farmland of Local Importance, 16 acres of Grazing Land, and 6 acres of Other Lands, totaling about 231 acres of Other Farmland.

Construction of the Westside Option would not affect any Important Farmlands but would result in temporary impacts to less than 1 acre of Farmland of Local Importance, and about 18 acres of Grazing Land. The tunnel segment would minimize ground disturbance and impact to farmland through this area. Construction of the Eastside Option would not affect any Important Farmland but would temporarily affect less than 1 acre of Farmland of Local Importance, about 33 acres of Grazing Lands, and 12 acres of Other Lands. Two short stretches of tunnel would minimize ground disturbance through this area.

Power Supply

All the proposed power transmission lines would be constructed or upgraded along existing utility alignments. Pole installation and stringing overhead lines would have temporary construction impacts on these lands as power poles are upgraded or replaced, and new transmission lines strung. The work areas would extend an estimated 25 feet on both sides of the new power lines for 3 to 6 months.

Power Option 1 (Western Only). Construction of a new Western substation and transmission lines would temporarily affect about 15 acres of Prime Farmland, 19 acres of Unique Farmland, and 5 acres of Farmland of Statewide Importance, totaling about 39 acres of Important Farmland. About 23 acres of temporarily affected Other Farmland includes 4 acres of Farmland of Local Importance, 16 acres of Grazing Land and 3 acres of Other Lands.

Power Option 2 (Western & PG&E). Under this option, construction would not affect any Important Farmlands, but construction of Power Option 2 including a new PG&E substation would temporarily affect 12 acres of Farmland of Local Importance, 8 acres of Grazing Lands and 3 acres of Other Lands, totaling about 23 acres of Other Farmland.

Recreation Facilities

Construction to relocate and expand the recreational facilities within the Los Vaqueros Watershed would not affect any Important Farmlands but would temporarily affect 4 acres of Farmland of Local Importance, 22 acres of Grazing Lands, and less than 1 acre of Other Lands, totaling about 27 acres of temporarily affected land. Given the extent of construction associated with the reservoir expansion, these agricultural areas would probably be disrupted for up to 3 years.

Marina Complex and Interpretive Center. These facilities would be constructed on the dam borrow area, which would permanently remove the current grazing land. Construction of this facility would result in no temporary impacts to farmland, because all impacts to grazing land would be permanent, as discussed under Impact 4.8.2.

Hiking Trails/Access. Construction of new and replacement trails, and of road access would not affect any Important Farmlands, but would temporarily affect 4 acres of Farmland of Local Importance, 22 acres of Grazing Lands, and less than 1 acre of Other Lands.

Other Recreational Facilities. Construction of replacement Fishing Piers, Picnic Areas, Restrooms, Parking, and similar recreational facilities would not affect any Important Farmlands but would temporarily affect about 1 acre of Grazing Lands, as shown in Table 4.8.4.

Summary

In summary, under Alternative 1, temporary construction would affect up to 91 acres of Prime Farmland, 39 acres of Unique Farmland, and 41 acres of Farmland of Statewide Importance for a total of 171 acres of temporarily impacted Important Farmlands. This would represent about 0.4 percent of the 41,619 acres of Important Farmlands in Contra Costa County. No Important Farmlands are within the project area in Alameda County. Temporary impacts to Important Farmland under Alternative 1 would be significant.

Alternative 2

Alternative 2 would have the same temporary construction impacts on Important Farmland as those discussed under Alternative 1. The temporary impacts to Important Farmland under Alternative 2 would be significant.

Alternative 3

Alternative 3 would result in construction activities affecting up to 327 acres of agricultural land, including 149 acres of Important Farmland. As indicated on Tables 4.8-4 and 4.8-5, Alternative 3 would not include the South Bay Connection, which includes construction of a new Delta Intake and Pump Station and the Transfer-Bethany Pipeline. As a result, Alternative 3 would avoid temporary impacts to about 22 acres of Farmland of Statewide Importance. Expansion of the existing Old River Intake and Pump Station under Alternative 3 would not affect farmland because the expansion would occur on the existing site. The total amount of Important Farmlands affected would represent about 0.3 percent of the 41,619 acres of Important Farmlands in Contra Costa County. Temporary impacts to Important Farmland under Alternative 3 would be significant.

Alternative 4

Alternative 4 would not affect any Important Farmlands but could result in short-term disruption affecting about 5 acres of Farmland of Local Importance and 19 acres of Grazing Lands. This alternative would result in less construction impact to farmlands than Alternative 1 because it involves a limited expansion of Los Vaqueros Reservoir and associated Recreation Facilities and does not include construction of a Delta intake, conveyance facilities, or power supply. Temporary impacts to agricultural lands under Alternative 4 would be less than significant because there would be no impacts to Important Farmland.

Mitigation Measures

Measure 4.8.1: To minimize temporary construction impacts to agricultural activities on Important Farmland, CCWD shall ensure that the following measures are incorporated into the project construction plans and specifications:

- Ensure that the existing drainage systems at proposed project sites needed for farming activities function as necessary to avoid disrupting agriculture
- Design dewatering operations to maximize dewatering in the immediate area of trench and to minimize drawdown area outside of trench during dewatering of construction trenches and other excavated areas; monitor soil moisture in adjacent crop fields to ensure adequate crop moisture and assist with irrigation scheduling
- Locate construction access and staging areas in areas that are fallow and use existing roads to access construction areas to the extent possible
- Coordinate construction scheduling as practicable to minimize disruption of agricultural operations by scheduling excavation before or after the growing season
- Minimize construction dust on crops by implementing Air Quality Measures 4.10.1

The above mitigation measures would reduce temporary construction impacts to less-than-significant levels.

Impact Significance after Mitigation: Less than Significant.

Impact 4.8.2: The project would permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use. (Less than Significant for Alternative 4; Less than Significant with Mitigation for Alternative 3; Significant and Unavoidable for Alternatives 1 or 2)

Table 4.8-6 presents the acres of farmland permanently affected by each project component. Permanent impacts from the proposed project are shown by alternative in **Table 4.8-7**. As noted in the Regulatory Setting, Important Farmlands are defined as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance. Project impacts to Farmland of Local Importance, Grazing Lands, and Other Lands are not considered significant in this analysis; however, the data has been included for disclosure purposes.

Alternative 1

Under this alternative, development of the new Delta Intake and Pump Station would require the permanent conversion of 21.5 acres of Farmland of Statewide Importance.

Power Supply Option 1 also includes the potential for the Western substation to be located on Unique Farmland (a type of Important Farmland) instead of on Grazing Land. As a result of the flexibility in facilities siting, the Western substation would be sited within the study area to avoid and minimize impacts to Important Farmland. The expectation is that the Unique Farmland area would be avoided by project design. Although no impacts to Important Farmland are expected, Mitigation Measure 4.8.2b will be implemented to ensure that final siting plans consider, and minimize and avoid, any permanent impacts to Important Farmland.

Project construction activities, though temporary, could also result in the impairment of agricultural land that could contribute to permanent long-term loss of agricultural acreage for cultivation if protective measures are not taken. Pipeline construction through cultivated agricultural areas could result in adverse effects, such as soil compaction, changes in groundwater or surface hydrology and drainage, and soil profile alteration.

The conveyance pipelines would primarily be constructed using a conventional trench design. The pipeline would be buried in a trench excavated to maintain a minimum 5-foot cover over the pipe. This depth was decided based upon CCWD's recent experience with pipelines through agricultural areas for the Alternative Intake Project (AIP). For that project, geotechnical investigations indicated that the soils in lower elevation parts of the Delta are a mix of loosely consolidated sands, silts, and clays, and are predominantly mineral soil type. With soils of these characteristics, the current practice of managing water level below the root zone via subsurface drainage could continue to be implemented with a minimum of 5 feet of cover over the pipeline.

Pipeline facilities would also include some appurtenances installed in buried vaults that extend aboveground (e.g., blow-off or air-release valves). Since most project pipelines would be sited in existing utility corridors and/or along existing roadways, these aboveground valves would be sited at the edge of fields, minimizing effects on agricultural operations. The eastern portion of the Delta-Transfer Pipeline (proposed to be constructed in an existing utility corridor along existing roadways) extends through areas of Important Farmland. However, valves not located along the edge of roads would not be located on Important Farmland.

TABLE 4.8-6
PERMANENT IMPACTS ON FARMLAND RESOURCES BY PROPOSED PROJECT COMPONENTS

	IMPORTANT FARMLAND (in Acres)				OTHER FARMLAND (in Acres)			
	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	***SUBTOTAL: IMPORTANT FARMLAND***	Farmland of Local Importance	Grazing Land	Other Lands	TOTAL FARMLAND
Los Vaqueros Reservoir Expansion/Dam Modification								
Dam Raise and Inundation - 275 TAF (Alts 1, 2, and 3)	0	0	0	***0***	552.5	444.5	0.5	**997.5**
Dam Raise and Inundation -160 TAF (Alt 4)	0	0	0	***0***	267	147	0	**414**
Borrow Areas -160 TAF (Alt 4)	0	0	0	***0***	46	22	0	**68**
Delta Intake Facilities								
New Delta Intake and Pump Station (Alts 1 and 2)	0	0	21.5	***21.5***	0	0	0	**21.5**
Old River Intake and Pump Station Expansion (Alt 3)	0	0	0	***0***	0	0	0	**0**
Conveyance Facilities								
Delta-Transfer Pipeline (Alts 1, 2, and 3)	0	0	0	***0***	0	0	0	**0**
Transfer Facility Expansion (Alts 1, 2, and 3)	0	0	0	***0***	0	0	3.5	**3.5**
Transfer-LV Pipeline (Alts 1, 2, and 3)	0	0	0	***0***	0	0	0	**0**
Transfer –Bethany Pipeline Main (Alts 1 and 2)	0	0	0	***0***	0	0	0	**0**
Westside Option (Alts 1 and 2)	0	0	0	***0***	0	0	0	**0**
Eastside Option (Alts 1 and 2)	0	0	0	***0***	0	0	0	**0**
Spoils Disposal - 275 TAF (Alts 1, 2 and 3)	0	0	0	***0***	14.5	7	0	**21.5**
Power Supply								
Power Option 1: Western Only (Alts 1, 2 and)	0	0	0	***0***	0	2	0	**2**
Power Option 2: Western & PG&E (Alts 1, 2 and 3)	0	0	0	***0***	0	2	0	**2**
Recreation Facilities								
Marina Complex (Alts 1, 2 and 3)	0	0	0	***0***	0	47.5	0	**47.5**
Marina (replacement - Alt 4)	0	0	0	***0***	0	9	0	**9**
Hiking Trails/Access (Alts 1, 2 and 3)	0	0	0	***0***	12	51.5	0.5	**64**
Hiking Trails/Access (Alt 4)	0	0	0	***0***	14.5	44	0	**58.5**
Other Facilities - Fishing Piers, Picnic Areas, Restrooms, Parking (Alts 1, 2 and 3)	0	0	0	***0***	5.5	6.5	0	**12**
Other Facilities - Fishing Piers, Picnic Areas, Restrooms, Parking (Alt 4)	0	0	0	***0***	0	1	0	**1**

NOTE: Important Farmland is composed of Prime Farmland, Unique Farmland and Farmland of Statewide Importance

Alt = Alternative PG&E = Pacific Gas and Electric Company TAF = thousand acre-feet Western = Western Area Power Administration

TABLE 4.8-7
PERMANENT IMPACTS ON FARMLAND RESOURCES BY PROPOSED PROJECT ALTERNATIVES

	IMPORTANT FARMLAND (in Acres)				OTHER FARMLAND (in Acres)			
	Prime Farmland	**Unique Farmland**	**Farmland of Statewide Importance**	***SUBTOTAL: IMPORTANT FARMLAND***	**Farmland of Local Importance**	**Grazing Land**	**Other Lands**	**TOTAL FARMLAND**
Alternative 1 - 275 TAF								
Dam Raise and Inundation	0	0	0	***0***	552.5	444.5	0.5	**997.5**
New Delta Intake and Pump Station	0	0	21.5	***21.5***	0	0	0	**21.5**
Conveyance	0	0	0	***0***	14.5	7	3.5	**25**
Power Option 1: Western Only	0	0	0	***0***	0	2.18	0	**2.18**
Power Option 2: Western & PG&E	0	0	0	***0***	0	2	0	**2**
Recreation Facilities	0	0	0	***0***	17.5	105.5	0.5	**123.5**
Alternative 2 - 275 TAF								
Dam Raise and Inundation	0	0	0	***0***	552.5	444.5	0.5	**997.5**
New Delta Intake and Pump Station	0	0	21.5	***21.5***	0	0	0	**21.5**
Conveyance	0	0	0	***0***	14.5	7	3.5	**25**
Power Option 1: Western Only	0	0	0	***0***	0	2	0	**2**
Power Option 2: Western & PG&E	0	0	0	***0***	0	2	0	**2**
Recreation Facilities	0	0	0	***0***	17.5	105.5	0.5	**123.5**
Alternative 3 - 275 TAF								
Dam Raise and Inundation	0	0	0	***0***	552.5	444.5	0.5	**997.5**
Old River Intake and Pump Station Expansion	0	0	0	***0***	0	0	0	**0**
Conveyance	0	0	0	***0***	0	0	3.5	**3.5**
Power Option 1: Western Only	0	0	0	***0***	0	2	0	**2**
Power Option 2: Western & PG&E	0	0	0	***0***	0	2	0	**2**
Recreation Facilities	0	0	0	***0***	17.5	105.5	0.5	**123.5**
Alternative 4 - 160 TAF								
Dam Raise and Inundation	0	0	0	***0***	167	147	0	**314**
160 TAF Recreation	0	0	0	***0***	14.5	54	0	**68.5**
Borrow Area (Kellogg Valley)	0	0	0	***0***	16	22	0	**38**

* Important Farmland is composed of Prime Farmland, Unique Farmland and Farmland of Statewide Importance

PG&E = Pacific Gas and Electric Company TAF = thousand acre-feet Western = Western Area Power Administration

Other important agricultural considerations related to pipeline trench excavation are soil profile and compaction. Construction methods, such as using scrapers to stockpile the top layer of soil, can be implemented to ensure minimal soil profile alteration during trench backfill. Maximum compaction is a desirable result for construction, but undesirable for areas intended for future plant growth. Excess compaction inhibits root, water, and air penetration in soil and thus plant growth. With insufficient compaction, soil may settle over time, potentially interfering with surface water flow and tractor traffic over the land. Geotechnical investigations and compaction monitoring during trench backfill are among methods that can be implemented to ensure appropriate compaction and minimize effects on the existing land use. If consideration of the agricultural concerns noted above were included in the design, the presence of the buried pipeline would not preclude farming over the pipeline alignment; therefore, no acreage of permanent agricultural land conversion is anticipated for the pipeline corridor.

Summary

In summary, Alternative 1 would result in permanent conversion of about 22 acres of Important Farmland to nonagricultural use. Alternative 1 would not result in permanent impacts on Prime Farmland or Unique Farmland, but the new Delta Intake and Pump Station would result in permanent conversion of 22 acres of Farmland of Statewide Importance, and could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be significant.

Alternative 2

Alternative 2 would have the same impacts on farmland as those discussed above for Alternative 1 because Alternative 2 would involve implementation of the same facilities. Like Alternative 1, Alternative 2 would result in permanent conversion of 22 acres of Farmland of Statewide Importance, and could result in additional long-term loss of Important Farmland if protective measures are not taken during construction. This impact would be significant.

Alternative 3

Alternative 3 would result in conversion of 1,126 acres of Other Farmland, and no acres of Important Farmland because Alternative 3 does not include construction of the new Delta Intake and Pump Station. No additional land would be converted to upgrade facilities at the Old River Intake and Pump Station. Permanent impacts from project facilities are presented in Tables 4.8-6 and 4.8-7. No permanent conversion of Important Farmland would result from Alternative 3; however, Alternative 3 could result in long-term loss of Important Farmland if protective measures are not taken during construction. Impacts on agriculture would be significant.

Alternative 4

Alternative 4 would result in conversion of 551 acres of Other Farmland, but no loss of Important Farmland. This alternative's impacts result from expanding the reservoir to 160 TAF and replacing recreational facilities, which affects primarily Grazing Land (282 acres) and a lesser amount of Farmland of Local Importance (201 acres). There would be no impacts related to conveyance

facilities or new power supply facilities because these components would not be constructed under Alternative 4. No permanent conversion of Important Farmland would result from Alternative 4 and construction would not result in long-term loss of Important Farmland; therefore, impacts on agriculture would be less than significant.

Mitigation Measures

Measure 4.8.2a: To support the continued productive use of Important Farmlands in the project area, CCWD shall ensure that the following measures are taken during project construction activities in Important Farmland:

- Replace soils over pipelines in a manner that will minimize any negative impacts on crop productivity. The surface and subsurface soil layers will be stockpiled separately and returned to their appropriate locations in the soil profile.
- Monitor pre-construction soil densities and return the surface soil (approximately the top 3 feet) to within 5 percent of original density so that over-compaction of the top layers of soil is avoided.
- Rip the top soil layers, where necessary, to achieve the appropriate soil density. Ripping may also be used in areas, such as in construction staging locations, where vehicle and equipment traffic have compacted the top soil layers.
- Minimize compaction and loss of soil structure by not working or traveling on wet soil. Before construction begins, geotechnical testing will be done to determine the moisture content limit above which work should not occur. Where working or driving on wet soil cannot be avoided, roadways will be capped with spoils that will be removed at the end of construction and/or ripped and amended with organic material as needed.
- Remove all construction-related debris from the soil surface. This will prevent rock, gravel, and construction debris from interfering with agricultural activities.
- Perform soil density monitoring during backfill and ripping to minimize excessive compaction and minimize effects on future agricultural land use.
- Remove topsoil before excavating in fields. Return topsoil to top of fields to avoid detrimental inversion of soil profiles.
- Control compaction to minimize changes to lateral groundwater flow, which could affect both irrigation and internal drainage.

Measure 4.8.2b: CCWD will provide the following mitigation for the conversion of Important Farmland:

For each acre of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance that is permanently converted to nonagricultural use, 1 acre of agricultural conservation easement will be obtained. An agricultural conservation easement is a voluntary, recorded agreement between a landowner and a holder of the easement that preserves the land for agriculture. The easement places legally enforceable restrictions on the land. The exact terms of the easement are negotiated, but restricted activities will include subdivision of the property, non-farm development, and other uses that are inconsistent with agricultural

production. The mitigation lands must be of equal or better quality (according to the latest available FMMP data) and have an adequate water supply. In addition, the mitigation lands must be within the same county. Information presented in Table 4.8-6 indicates that this compensatory mitigation would require acquisition of easements on about 22 acres of Farmland of Statewide Importance, preferably within Contra Costa County.

Impact Significance after Mitigation: Significant and unavoidable. These mitigation measures would reduce the impact of the proposed conversion of Farmland of Statewide Importance to nonagricultural uses, but not to a less-than-significant level.

Impact 4.8.3: The project would not conflict with zoning for agricultural use or a Williamson Act contract. (Less than Significant for Alternatives 1, 2, and 3; No Impact for Alternative 4)

Figure 4.8-2 shows the properties in the project area that are currently under Williamson Act contracts. Proposed project components would be on or next to 9 properties under Williamson Act contract. **Table 4.8-8** lists the project facilities and number of properties with Williamson Act contracts that would be affected (Note that multiple facilities may cross the same parcel, therefore the total is greater than 9):

TABLE 4.8-8
NUMBER OF PROPERTIES WITH WILLIAMSON ACT CONTRACTS THAT WOULD BE AFFECTED

Project Component	Parcels With Williamson Act Contracts
Delta-Transfer Pipeline	1
Expanded Transfer Facility	1
Transfer-LV Pipeline	2
Transfer-Bethany Pipeline	6
Power Supply Option 1	1
Power Supply Option 2	1

Further information on potential impacts to Williamson Act lands is provided by facility, as follows:

Los Vaqueros Reservoir and Dam Modifications

Because CCWD is a special district not eligible for placing land under Williamson Act contracts and also owns all the land for the reservoir expansion, the area to be affected by the reservoir expansion or provision of recreation facilities is not under Williamson Act contract.

Delta Intake Facilities

None of the properties to be affected by constructing new, or by expanding existing intake facilities, are under Williamson Act contract.

Conveyance Facilities

The project components that are near or pass through land subject to Williamson Act contracts include portions of all three water-conveyance pipelines (Delta-Transfer Pipeline, Transfer-LV Pipeline, and Transfer-Bethany Pipeline (Westside and Eastside Options)) and the Expanded Transfer Facility property.

Delta-Transfer Pipeline. In the area east of the Expanded Transfer Facility, this pipeline would pass by one property under Williamson Act contract.

Transfer Facility Expansion. The area north of the Transfer Facility includes one property under Williamson Act contract.

Transfer-LV Pipeline. In the area south and west of the expanded Transfer Facility, this pipeline would pass by 2 properties under Williamson Act contracts.

Transfer-Bethany Pipeline. The main portion of the Transfer-Bethany Pipeline would pass by or through 6 parcels under Williamson Act contract. However, the pipeline's Westside Option would tunnel under Williamson Act land and the tunneling portals would also be outside of Williamson Act contract areas. For the Eastside Option, one tunneling portal would occur near—however, not on—contracted land. No Williamson Act lands in Alameda County would be affected by project construction.

Power Supply

A portion of a new 21 kV transmission line under Power Option 1 (Western Only) would be in an existing utility easement that passes through or next to one property that is under contract. Under Power Option 2, the upgrade of an existing PG&E 21 kV transmission line would cross one property also under Williamson Act contract.

Alternative 1

As indicated in Table 4.8-8, under Alternative 1, project facilities and pipeline alignments would be on or next to 9 properties with Williamson Act contracts. Some contracted properties are affected by more than one project component, resulting in a total greater than 9. Construction of the Delta-Transfer and Transfer-LV Pipelines would temporarily affect agricultural use of lands because these facilities would require acquisition of temporary construction easements in active or fallowed agricultural lands under Williamson Act contracts.

Construction of the Transfer-Bethany Pipeline in the project area would require both temporary construction easements (up to 300 feet wide) and long-term (up to 85 feet wide) acquisition of fee title or easement interests in the active or fallowed agricultural lands that are under Williamson Act contract. The Williamson Act anticipates such acquisitions and states that when an agency acquires all or a portion of property subject to the Williamson Act by eminent domain or threat of condemnation, the Williamson Act contract is deemed null and void as to the land or interest acquired by the agency. If only an easement is acquired, then the contract is void as to that interest.

Moreover, proposed water facility uses on Williamson Act contracted lands are considered compatible under Section 51238.1 of the Government Code that governs compatibility of Williamson Act lands with nonagricultural uses. The section states that "the erection, construction or maintenance of …water...facilities are hereby determined to be compatible uses within any agricultural preserve."

Summary

In summary, under Alternative 1, temporary and permanent impacts to lands that are under Williamson Act contract are considered less than significant.

Alternative 2

Alternative 2 would affect the same 9 properties under Williamson Act contracts as those discussed for Alternative 1, because the facilities to be constructed are the same. Therefore, impacts under this alternative would be considered less than significant.

Alternative 3

Under Alternative 3, up to 4 properties under Williamson Act contracts would be affected by construction of the Delta-Transfer Pipeline, the Transfer-LV Pipeline, and Power Option 1. Impacts associated with these facilities were discussed under Alternative 1. Because Alternative 3 would not involve construction of the Transfer-Bethany Pipeline, less contracted land would be affected than under Alternative 1. Like Alternative 1, impacts under this alternative would be considered less than significant.

Alternative 4

Under Alternative 4, none of the facilities proposed for expanding the reservoir to 160 TAF or providing recreation facilities would impact lands under Williamson Act contracts. There would not be any construction or associated impacts to Williamson Act lands related to conveyance facilities or new power supply facilities because these components would not be built under Alternative 4. There would be no impact.

Mitigation: None required.

Impact 4.8.4: The project would involve changes in the environment that, due to their location or nature, could contribute to cumulative impacts from conversion of Important Farmland to nonagricultural uses. (Less than Significant for Alternative 4; Less than Significant with Mitigation for Alternative 3; Significant and Unavoidable for Alternatives 1 or 2)

Alternative 1

The Los Vaqueros Reservoir Expansion Project is a water infrastructure project, not a land development project, and would not result in impacts to agricultural resources that would be expected with a typical development project. The proposed project would not result in further

urbanization of the area, make agricultural land vulnerable to the pressures of urbanization, or lead to the additional loss of farmland to nonagricultural uses. Nonetheless, under Alternative 1, about 22 acres of Farmland of Statewide Importance would be permanently removed from agricultural use to allow construction of the new Delta Intake and Pump Station.

Most agricultural lands in Contra Costa and Alameda Counties are in the eastern portion of each county. In 2006 (most recent inventory), the total acreages of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance in Contra Costa County and Alameda County were 41,619 and 8,439 acres, respectively. A reduction of 2,881 acres of Important Farmland for Contra Costa County and of 826 acres for Alameda County has occurred between 2004 and 2006 (see Tables 4.8-1 and 4.8-2) (DLRP, 2008).

With or without the project, the trend of land conversion from agricultural uses to urban and other nonagricultural uses (e.g., wildlife habitat enhancement) in these counties will continue. The land development projects considered in this Environmental Impact Statement/Environmental Impact Report assessment of cumulative impacts are listed in Table 4.1.2 and also listed in Appendix I, Table I-1, Potential Projects for Cumulative Effects Evaluation. Projects that are located in areas with agricultural use that would contribute to loss of Important Farmland to non-agricultural uses include the 1,100 acre Cecchini Ranch and the Discovery Bay/Byron Wastewater Treatment Plant Upgrade, both within the urban limit line of Discovery Bay. The CCWD AIP and its associated pipeline to the Old River Intake and Pump Station are located on Victoria Island, an active farming area. A number of public works projects (Zone 7 Altamont Water Treatment Plant and Pipeline; DWR South Bay Aqueduct Enlargement Project; various Road Safety Improvement and Widening Projects) could further contribute to the ongoing loss of Important Farmland through direct loss by conversion of farmland and/or by supporting the change of agricultural areas to more urban uses. The ongoing Mountain House Community development would continue to contribute to the loss of farmland through its subdivision of grazing and other agricultural land for urban uses.

As a number of the proposed projects are not yet in the environmental planning stage, the acreage of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance that could be converted by these projects is not known. However, in general, the acreage of Important Farmland in Contra Costa County and in Alameda County is expected to continue to decline. Alternative 1 would contribute incrementally to this decline.

The incremental contribution of farmland conversion associated with the proposed project would be a cumulatively considerable contribution to an existing significant cumulative impact. This impact would be significant.

Alternative 2

Under Alternative 2, which would construct the same facilities as Alternative 1, the proposed project would contribute to a significant cumulative impact with respect to the cumulative conversion of Farmland of Statewide Importance to nonagricultural use, even with implementation of Mitigation Measure 4.8.2a and 4.8.2b. The incremental contribution of farmland conversion associated with the proposed project would be a cumulatively considerable

contribution to a significant cumulative impact. Under Alternative 2, this impact would therefore be significant.

Alternative 3

Under Alternative 3, no Important Farmland would be permanently impacted because this Alternative does not involve construction of the new Delta Intake and Pump Station or the Transfer-Bethany Pipeline. With implementation of Mitigation Measure 4.8.2a, Alternative 3 would not contribute to the cumulative loss of Important Farmland. Before mitigation, Alternative 3 would result in a significant impact.

Alternative 4

Under Alternative 4, no Important Farmland would be permanently impacted because this Alternative does not involve construction of the New Delta Intake and Pump Station or new water conveyance pipelines through agricultural areas. Furthermore, Alternative 4 would not involve construction of Power Supply facilities. Alternative 4 would not contribute to the cumulative loss of Important Farmland.

Mitigation Measure

Implementation of Agricultural Resources Mitigation Measures 4.8.1 and 4.8.2 (a and b) would minimize potential impacts under Alternatives 1 and 2; however, those measures would not reduce cumulative impacts to less-than-significant levels. The level of significance after mitigation would be a significant and unavoidable cumulative impact for Alternatives 1 and 2. With Mitigation Measure 4.8.2a, Alternative 3 would not result in a cumulatively considerable contribution to a significant impact on agriculture.

Impact Significance after Mitigation: Significant and Unavoidable for Alternatives 1 or 2; Less than Significant for Alternatives 3 and 4.

4.9 Transportation and Circulation

This section describes the existing transportation facilities in the project study area, including local and regional roadways, transit service, and bicycle routes as well as existing traffic conditions. This section focuses primarily on project construction effects, including potential impacts to (1) roadways that are adjacent to or within the construction corridor of various project facilities and could therefore be affected by construction, and (2) roadways that are potential routes that construction workers, materials delivery, and other equipment trucks could use to access construction sites. The effects on traffic circulation from project operation are also addressed.

4.9.1 Affected Environment

Regulatory Setting

Federal and State

The California Department of Transportation (Caltrans) is responsible for planning, designing, constructing, operating, and maintaining all State-owned roadways in Contra Costa and Alameda Counties. Federal highway standards are implemented in California by Caltrans.

Local

Contra Costa County

The Contra Costa County General Plan (2005) contains goals and policies to inform agencies of the County-approved ways to maintain an efficient traffic circulation network. Such goals and policies discuss right-of-way requirements (Policy 5-5), emergency response efficiency (Policy 5-16), and roadway development (Policy 5-4). The general plan also outlines level of service (LOS) standards and routes of regional significance. For specific policies related to transportation and circulation in Contra Costa County, see Appendix E-2. The County has not designated local truck routes nor adopted specific policies regarding management of construction activities.

Alameda County

The Alameda County East County Area Plan (2002) contains goals and policies to inform agencies of the County-approved ways to maintain an efficient circulation network in the eastern portion of the county. Such goals include creating and maintaining a balanced multimodal transportation system (General Transportation Goal 1), cooperating with other regional transportation plans (Policy 178), integrating pedestrian use into the transportation system (Policy 212), and mitigating exceedances of LOS standards (Policy 193). The plan also discusses lane requirements for intercity arterials (Policy 193) and right-of-way requirements in the eastern portion of the county. For specific policies related to transportation and circulation in Alameda County, see Appendix E-1. Alameda County has not designated local truck routes nor adopted specific policies regarding management of construction activities.

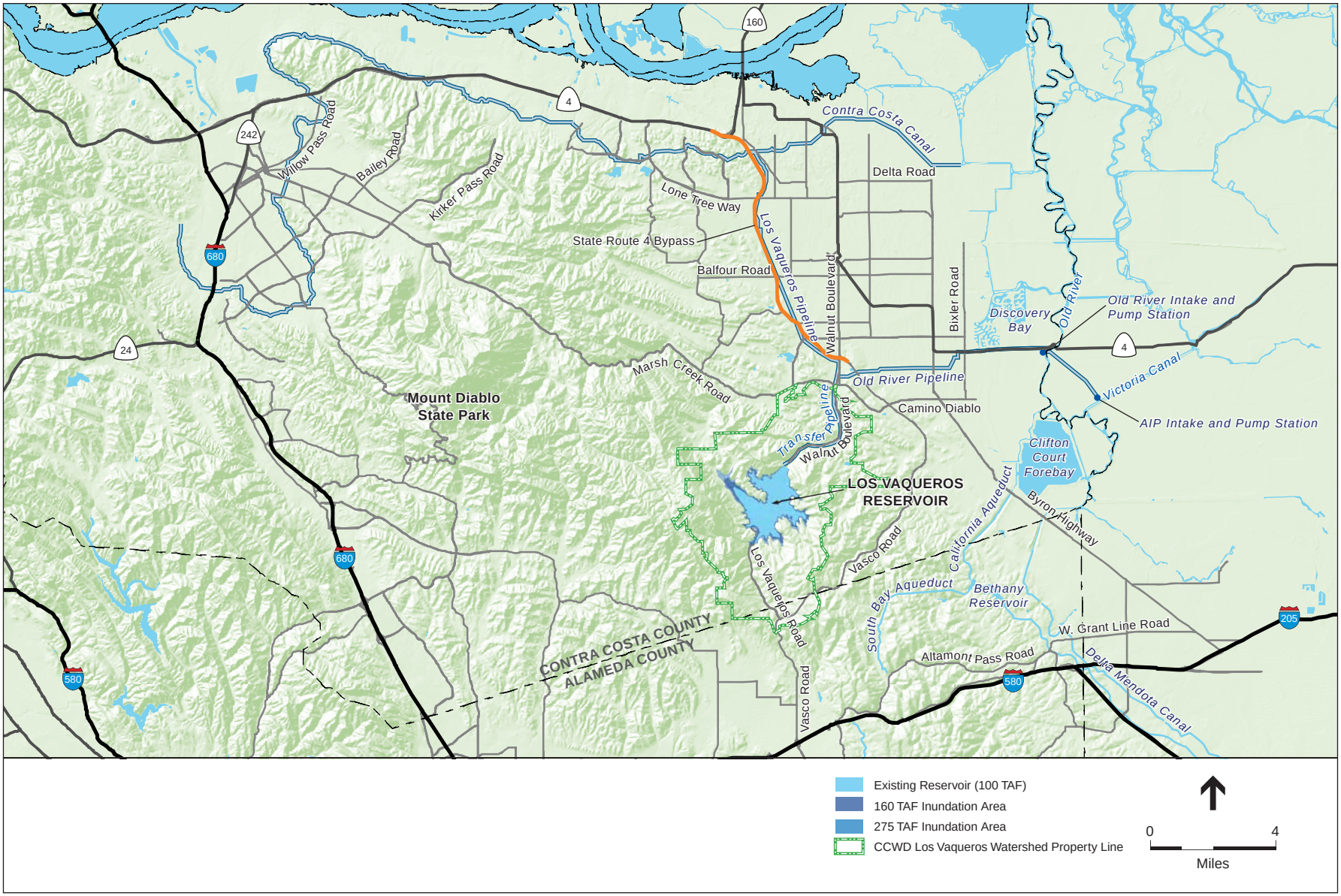
Regional Setting

Figure 4.9-1 shows the regional roadway network consisting of state highways, regional freeways, and county roads. **Figure 4.9-2** identifies the project facilities and the local and regional roadway network that could be affected by construction and operation of these facilities. Specific roadways are described below. **Table 4.9-1** indicates the highways and roads that would or could be used for project construction traffic and those that would be affected by actual project construction activities (i.e., where construction activities are proposed in, adjacent to or across roads). **Table 4.9-2** presents average daily traffic estimates for relevant regional roadways.

TABLE 4.9-1
ROADWAYS USED AND/OR AFFECTED DURING PROJECT CONSTRUCTION

Roadway	Potential Construction Activity Travel Routes [1]	Roadways Affected by Project Construction
Interstate Highway		
Interstate 5	Yes – provides regional and statewide access to the project region	No
Interstate 205	Yes – provides direct regional access to the project area	No
Interstate 580	Yes- provides direct regional access to the project area	No
Interstate 680	Possible – provides regional access to the project region	No
Regional Highway		
State Route 4 and SR 4 Bypass	Yes – provide direct access to the project area	Yes – Delta Transfer Pipeline construction proposed adjacent to SR 4 between Old River and Bixler Road. Possible new powerline construction proposed along SR 4 from just east of Bixler Rd to Bixler Rd.
Byron Highway	Yes – provides direct access to the project area from I-205	No
County Roads		
Vasco Road	Yes – provides direct local access from I-580 to the project area	Yes – Transfer-Bethany Pipeline construction proposed adjacent to Vasco Road for approximately 2 miles from SR 4 south.
Walnut Boulevard	Yes – provides direct local access to project area	Yes – Transfer-LV Pipeline construction proposed in and adjacent to Walnut Boulevard roadway between approximately Camino Diablo and the Los Vaqueros Watershed entrance.
Camino Diablo	Yes- provides direct local access to project area	Transfer-Bethany Pipeline construction proposed across Camino Diablo.
Marsh Creek Road	Possible – provides direct access to the project area	No
Hoffman Road	Yes – provides local access to Delta-Transfer Pipeline alignment	Yes – Delta-Transfer Pipeline and possible powerline facilities construction proposed along this road west of Bixler Road.
Byron Hot Springs Road	Yes – provides local access to the Transfer-Bethany Pipeline alignment	No
Armstrong Road	Yes – provides local access to the Transfer-Bethany Pipeline alignment	Yes – Transfer-Bethany Pipeline construction proposed along a segment of this road.

[1] Potential construction travel route could be used by construction workers and/or for construction equipment and materials hauling.

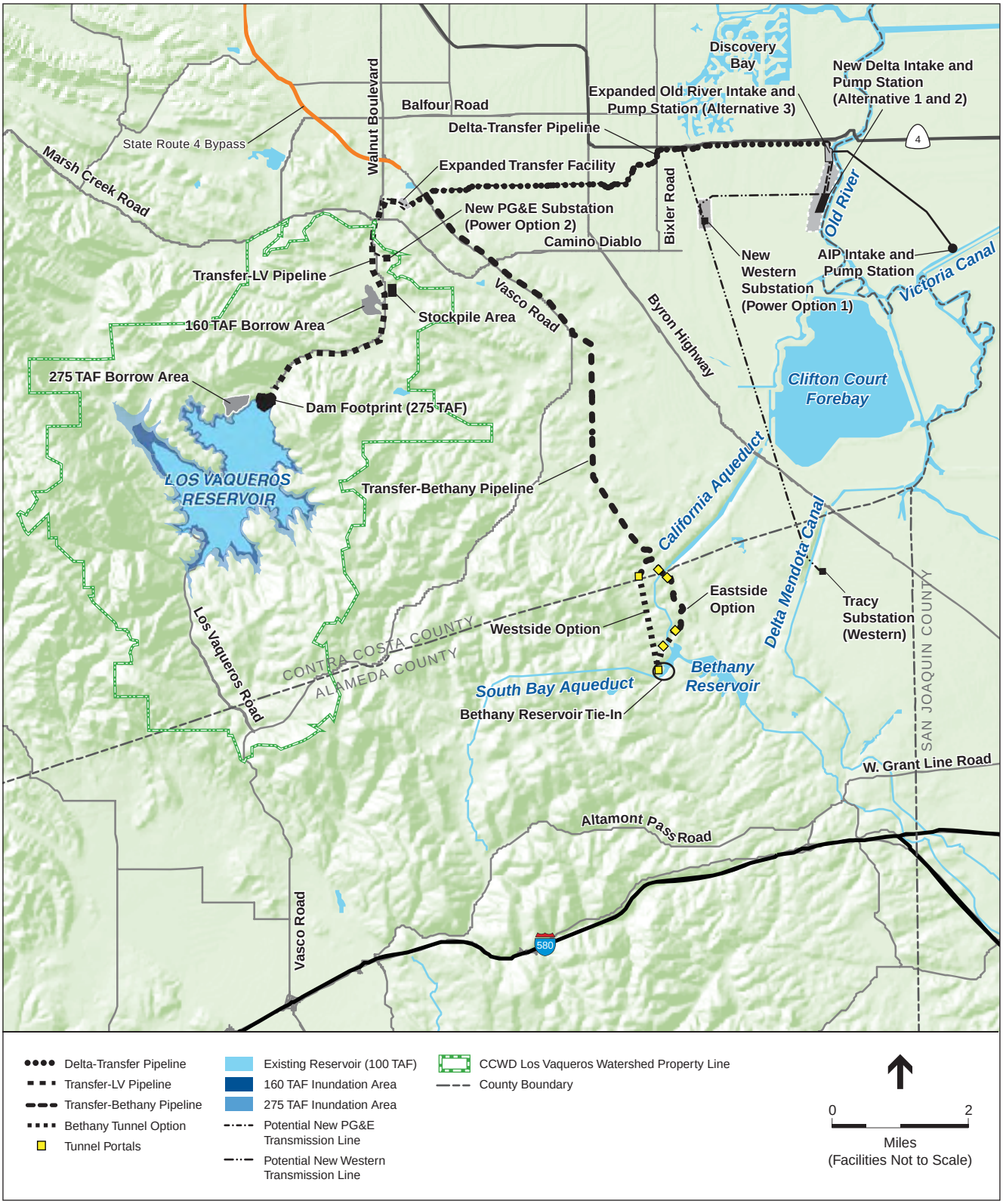


SOURCE: USGS, 1993 (base map); County of Contra Costa, 2005; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 4.9-1

Regional Roadway Network



SOURCE: California State Automobile Association, 2007; and ESA, 2007

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Figure 4.9-2

Project Area Roadways

TABLE 4.9-2
EXISTING AVERAGE DAILY TRAFFIC VOLUMES ON CALIFORNIA HIGHWAYS IN THE PROJECT AREA

Highway	Segment	Vehicles (% Trucks)[a]
State Route 4		
Contra Costa County	Willow Pass Road (Concord) to Railroad Avenue (Pittsburg)	125,000 to 157,000 (4.6% to 5.2%)
	Railroad Avenue to Contra Loma Boulevard (Antioch)	103,000 to 113,000 (4.6% to 5.2%)
	Contra Loma Boulevard to SR 160 (Antioch)	38,000 to 103,000 (4.6% to 5.2%)
	SR 160 to Lone Tree Way (Brentwood)	20,100 to 38,000 (13.8% to 15.4%)
	Lone Tree Way to Byron Highway (Brentwood)	16,700 to 23,800 (13.8% to 15.4%)
	Byron Highway to San Joaquin County line	9,700 to 19,400 (13.8% to 15.4%)
San Joaquin County	San Joaquin County line to Fresno Avenue (Stockton)	9,000 to 13,200 (9.8% to 16.5%)
	Fresno Avenue to I-5	16,000 to 29,000 (9.8% to 16.5%)
Interstate 580		
Alameda County	I-205 to Vasco Road	152,000 (10.2% to 12.5%)
	Vasco Road to North Livermore Avenue	176,000 to 184,000 (12.2%)

[a] Daily truck traffic as percent of total vehicle.

SOURCE: Caltrans, 2007.

State Route 4

State Route (SR) 4 is an east-west, four-lane highway that (as John Muir Parkway) connects Hercules at the Interstate 80 (I-80) junction to Martinez at the Interstate 680 (I-680) junction). East of Martinez, SR 4 becomes the California Delta Highway and passes through the cities of Concord, Pittsburg, and Antioch. The character of SR 4 changes at the Main Street interchange in Oakley, east of which SR 4 continues as a two-lane arterial roadway that passes through eastern Contra Costa County and then continues southward and eastward through the city of Brentwood and past Discovery Bay. SR 4 then crosses Old River and continues into San Joaquin County toward Stockton, where it intersects I-5. SR 4 crosses multiple waterways east of Discovery Bay, with generally narrow bridge crossings and curves in the road at entrances to the waterway crossings.

The SR 4 Bypass is a cooperative effort between Contra Costa County and the cities of Antioch, Brentwood and Oakley to ease traffic congestion through the Brentwood and Oakley areas by replacing the existing SR 4 from just south of the Main Street Interchange to the existing interchange with Marsh Creek Road. It has been constructed in three segments, with Segments 1 and 2 (from the existing SR 4 east of Hillcrest Avenue, in the Antioch/Oakley area, to Balfour Road in Brentwood)

and Segment 3 (Balfour Road to Marsh Creek Road, then along Marsh Creek Road to the existing SR 4 in Byron, with a Vasco Road Extension from Marsh Creek Road to Vasco Road at Walnut Boulevard) now open (SR 4 Bypass Authority, 2008).

Regional Interstates

I-580 is the major east-west truck travel route and main throughway in eastern Alameda County that connects to the Sacramento and San Joaquin Valleys. Other interconnecting regional transportation facilities include I-680, Interstate 205 (I-205), and I-5. The freeway interchanges that provide access to the project area road network are I-580 at Vasco Road and Grant Line Road, I-205 at West Grant Line Road (which connects to the Byron Highway), and I-5 at SR 4 (West Charter Way).

Local Setting

See Table 4.9-1, presented earlier in this section, for an overview of the roadways in the project area that would be used for construction traffic and/or affected by project construction activities. **Table 4.9-3** presents average daily traffic estimates for relevant local roadways. Weekday traffic within the east Contra Costa County area consists primarily of commuter traffic during morning and evening peak-traffic periods, and a mix of trips generated by residential, agricultural, and commercial/industrial uses throughout the day.

TABLE 4.9-3
EXISTING AVERAGE DAILY TRAFFIC VOLUMES ON LOCAL ROADWAYS IN THE PROJECT AREA

Roadway	Segment	Vehicles
Contra Costa County		
Vasco Road	Walnut Boulevard to Camino Diablo Camino Diablo to Alameda County line	18,000 21,790
Walnut Boulevard	Vasco Road to Camino Diablo	17,840
Camino Diablo	Byron Highway to Vasco Road Vasco Road to Walnut Boulevard Walnut Boulevard to Marsh Creek Road	2,290 7,785 1,815
Byron Highway	SR 4 to Camino Diablo Camino Diablo to Alameda County line	11,500 10,980
Alameda County		
Vasco Road	South of Dalton Avenue North of Dalton Avenue	24,110 23,130

SOURCES: Contra Costa County Traffic Engineering Division, 2005; City of Livermore, 2007

Vasco Road

Vasco Road is a major thoroughfare for travelers heading to the eastern and southern San Francisco Bay Area from the cities of Stockton, Brentwood, and Oakley. Locally, North Vasco Road heads south from Walnut Boulevard near Brentwood and crosses into Alameda County as it extends to

I-580. Vasco Road is primarily a two-lane arterial (with some four-lane segments, and some segments with two lanes in one direction and one lane in the opposite direction) that has heavy use during morning and evening commute hours. As described above, the last segment of the SR 4 bypass, including an extension of Vasco Road from Walnut Boulevard to Marsh Creek Road, has been completed and is now open for use.

Byron Highway

Byron Highway is a two-lane highway that extends across southeastern Contra Costa County into San Joaquin County connecting to I-205. It

Walnut Boulevard

Walnut Boulevard is a two-lane road that travels south from Brentwood and serves as the north entrance of the Los Vaqueros Reservoir watershed. Walnut Boulevard extends as Los Vaqueros Road to the existing Los Vaqueros Dam.

Camino Diablo

Camino Diablo is a two-lane road that heads west from the Byron Highway through the town of Byron; it crosses Vasco Road and Walnut Boulevard and ends at Marsh Creek Road.

Marsh Creek Road

Marsh Creek Road is a two-lane road that travels from just east of SR 4 (Byron Highway) near Discovery Bay westward to the town of Clayton. Marsh Creek Road heads west just south of the city of Brentwood and then travels south until it reaches Camino Diablo, where it again heads west. As described above, the last segment of the SR 4 bypass, which ties in to Marsh Creek Road, has been constructed and, as part of that work, Marsh Creek Road has been improved to Caltrans standards for a conventional two-lane expressway from west of Walnut Boulevard to the existing SR 4 (Byron Highway/California Delta Highway) in Byron.

Hoffman Road, Byron Hot Springs Road, Armstrong Road

These three roads are each local, two-lane paved rural roads in the project area providing access to rural residences and farmland areas.

Routes of Regional Significance

The Contra Costa Transportation Authority has established routes of regional significance. These routes are the roads that connect two or more regions in the county, cross county boundaries, carry a significant amount of through traffic, or provide access to a regional highway or transit facility. Regional routes of significance include all state highways and freeways as well as key arterials. The regional routes within the project area that would be affected by construction and operational traffic for the Los Vaqueros Reservoir Expansion Project include: Vasco Road from Walnut Boulevard to the Alameda County line; Camino Diablo from Marsh Creek Road to Vasco Road; and the SR 4 Bypass and SR 4 from Bixler Road to Old River.

Public Transit

The project area is served by two transit agencies that provide bus service to areas in eastern Contra Costa and Alameda Counties: the Eastern Contra Costa Transit Authority (Tri-Delta) and Livermore Amador Valley Transit Authority (LAVTA).

Eastern Contra Costa Transit Authority

Tri-Delta Transit operates 14 local bus routes and serves the cities of Brentwood, Antioch, Oakley, Pittsburg, and Bay Point. Bus routes 300, 383, 386, and 391 operate on the Brentwood Boulevard portion of SR 4 in the project area, but do not extend south through the project area. The Authority operates a regional route that provides bus service from Antioch, Oakley and Brentwood south to Livermore and Dublin Bart; the route follows SR 4 to Byron Highway south to I-580.

LAVTA (Wheels)

Wheels is a service of the LAVTA, which provides local public transit service to the cities of Dublin, Livermore, and Pleasanton and to the adjacent unincorporated areas of Alameda County. Lines 11 and 15 cross and run along portions of Vasco Road up to about one mile north of I-580, but not north of Livermore, or in to the project area north in Contra Costa County.

Bikeways/Pedestrian Circulation

The regional network of bicycle facilities includes a variety of Class I (bicycle paths), Class II (bicycle lanes, striped in roads), and Class III (bicycle routes without striping) bikeways within the cities and communities of Contra Costa County. The closest Class I, II, and III bikeways to the project sites are in Brentwood, over two miles north of the project area; none of these bikeways would be affected by project construction due to the fact that no project components would be constructed in or adjacent to bikeways, and it is anticipated that construction traffic would not use local Brentwood streets.

4.9.2 Environmental Consequences

Methodology

Construction

Construction activities for major infrastructure projects such as the Los Vaqueros Reservoir Expansion Project can result in short-term traffic and circulation impacts as a result of temporary increases in traffic from construction workers and transport of equipment and materials as well as construction activities in or near roadways that affect traffic flow and/or property access. The analysis of project construction effects on traffic, circulation and access is based on the description of project construction activities and schedule presented in Chapter 3, Project Description. Construction activities are described for each proposed facility throughout Section 3.5 and a summary of the overall project construction schedule, work force and key construction assumptions is presented in Section 3.5.7.

The impact analysis focuses on Alternative 1, which involves the maximum extent of new and/or expanded facilities and therefore represents the most extensive construction activity among the alternatives. For purposes of this impact analysis it is assumed that construction activity would be occurring at all facility sites at the same time, representing a peak construction scenario. The actual schedule of construction activities would be determined after final design and largely by the construction contractors. While some phasing of construction activities would be expected, in order to complete the facilities included in Alternative 1 on the proposed three-year construction schedule, some level of construction activity would need to occur concurrently at most facility sites. Construction characteristics, including proposed labor and equipment, location of construction, and rate of construction, were used to conservatively estimate the manpower level and number of vehicles that would be required for facilities installation.

Alternative 2 is the same as Alternative 1 in terms of facilities construction and therefore shares the same construction assumptions. Alternatives 3 and 4 involve fewer new or expanded facilities than Alternatives 1 and 2 and would generate less construction impact to traffic circulation and access than described for Alternatives 1 and 2.

Key construction scenario assumptions used in the analysis of potential project effects on traffic and circulation during construction include:

- A 3-year overall construction schedule for Alternatives 1, 2, and 3; a 2-year construction schedule for Alternative 4.
- Double-shift and Saturday work are implemented.
- The construction labor force for Alternatives 1 and 2 would consist of as many as six crews of about 50 to 70 workers each plus construction management personnel for a maximum total of up to 400 construction workers at all work sites at one period of the construction.
- The equipment specified for clearing/excavation/foundation, building construction, and interior mechanical/electrical activities would operate for about 8 to 16 hours a day (up to two shifts per day) over approximately 24 months. Equipment operations would occur over two 8-hour shifts typically extending from 6 a.m. to 10 p.m. Equipment might be removed from the site when no longer needed for construction activities.
- During road work, utility, and landscaping activities, equipment would also be used 8 to 10 hours a day, but the duration would decrease to about one year. Some equipment such as backhoes and light-duty trucks would be used during multiple stages of project construction, and therefore overlap of equipment types and duration is expected.
- An estimated 25 percent of the excavated soil would be hauled away from the work sites for disposal or reuse elsewhere. The remaining 75 percent would be stockpiled near the construction work zones for later use as backfill material and/or sidecast on to adjacent land. Trench and tunnel dimensions based on pipe diameters and lengths were used to calculate the amount of hauled material.

This analysis relies on available information, a field inventory of the project area, and estimates of daily vehicle trips generated by project-related activities, augmented by professional traffic engineering judgment. Existing traffic volumes on project area roadways were gathered from Contra

Costa County and Alameda County documents and Caltrans' website (2007a and 2007b). Field reconnaissance was undertaken to determine characteristics of roads that are proposed to accommodate construction-generated vehicle trips, including the number of travel lanes and land uses served by the affected roadways. Estimates of increased roadway traffic volumes generated by the project were compared to existing traffic volumes, and the effect of that percent increase on traffic flow was judged by a qualified expert in traffic analysis based upon experience and knowledge of the relevant roadway facilities and conditions.

Project Operation

The analysis for long-term increases in traffic associated with project operation considers the extent of additional employees required to operate the expanded facilities and the need for additional facilities maintenance activities. Project operation is projected to require very few additional employees, less than ten, and require little additional maintenance activity. Current maintenance and inspection trips to monitor the existing Los Vaqueros system would simply be extended to inspect new and expanded facilities. The potential for increased visitor traffic to the expanded recreation facilities within the Los Vaqueros Watershed is also evaluated.

Significance Criteria

The thresholds for determining the significance of impacts for this transportation and circulation analysis are based on the environmental checklist in Appendix G of the CEQA Guidelines as well as professional traffic engineering judgment. These thresholds also encompass the factors taken into account under the National Environmental Policy Act to determine the significance of an action in terms of its context and the intensity of its effects.

For this analysis, the project would be considered to have a significant impact on transportation and circulation if it would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (e.g., result in a substantial increase in traffic congestion affecting vehicle or transit circulation);
- Substantially impede access to local streets or adjacent uses, including access for emergency vehicles;
- Substantially increase traffic safety hazards due to incompatible use (e.g., construction in or adjacent to roadways, heavy truck traffic, and roadway wear-and-tear);
- Exceed, either individually or cumulatively, a level of service (LOS) standard established by the county congestion management agency for designated roads or highways.

The following transportation, traffic and circulation issues (including some identified in Appendix G of the CEQA guidelines) do not apply to this project and, as a result, are not addressed in this analysis, as explained below.

- Interference with Rail Service or Operations. Bore-and-jack construction techniques (see Chapter 3, Project Description) would be used to install project pipelines underneath

railroad tracks at the few places where a project pipeline crosses an existing railroad corridor. This construction technique involves tunneling beneath railroad tracks without compromising their stability or restricting rail activity. Therefore, the project alternatives would not affect rail service or operation.

- Change in Air Traffic Patterns resulting in substantial safety risks. Project alternatives would not affect air traffic patterns of the Byron Airport in the project area. Although some of the proposed pipelines and electrical transmission lines would be located within the Byron Airport Influence Area, construction equipment and project components would not exceed height restrictions within this area. Also, the project alternatives would not alter air traffic patterns nor result in substantial safety risks associated with airport operations (see airport impact discussion in Section 4.7 Land Use, under impacts 4.7.3 and 4.7.4).

- Result in inadequate parking capacity. Construction of facilities under each project alternative would not disrupt or displace existing parking facilities. Facilities construction would occur on existing CCWD property, along public road rights-of-way or across private property in agricultural use. There is no street parking provided on most roads in the project area. Parking areas would be needed to accommodate construction workers at each facility site but such parking areas would be provided within the construction easement or work area onsite. Construction workers would not park in areas used by others for parking.

- Increased Hazards Due to a Design Feature. The project alternatives would not include new design features for any roadways (e.g., new facilities or obstructions within public roadways) or alterations of existing features (e.g., road realignment). Therefore, the project alternatives would not result in hazards caused by a design feature.

- Conflicts with Adopted Policies, Plans, or Programs Supporting Alternative Transportation. Project alternatives would not directly or indirectly eliminate existing or planned alternative transportation corridors or facilities (e.g., bike paths, lanes, bus turnouts, etc.). In addition, project alternatives would not include changes in policies or programs that support alternative transportation, and it would not construct facilities in locations in which future alternative transportation facilities are planned. Therefore, the project alternatives would not conflict with adopted policies, plans, or programs supporting alternative transportation. The potential effect of project construction on existing bus transit service in the project area is discussed in Impact 4.9-1.

Impact Summary

Table 4.9-4 provides a summary of the impact analysis for issues related to transportation and circulation based on actions outlined in Chapter 3.

Impact Analysis

No Project/No Action Alternative

Under the No Project/No Action Alternative, no new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Because no additional vehicle trips would be generated, this alternative would not result in any adverse environmental effects with respect to transportation and circulation. Further, the No Project/No Action Alternative would not contribute to any cumulative transportation impacts.

TABLE 4.9-4
SUMMARY OF IMPACTS – TRANSPORTATION AND CIRCULATION

Impact	Project Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
4.9.1: Project construction activities would intermittently and temporarily increase traffic congestion due to vehicle trips generated by construction workers and construction vehicles on area roadways.	LSM	LSM	LSM	LS
4.9.2: Project construction activities would intermittently and temporarily impede access to local streets or adjacent uses, including access for emergency vehicles and could substantially increase traffic hazards due to construction in or adjacent to roads or due to possible road wear.	LSM	LSM	LSM	LS
4.9.3: Traffic associated with operation of project facilities, including the expanded recreation facilities, would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.	LS	LS	LS	LS
4.9.4: Construction of project alternatives, when combined with construction of other future projects, could contribute to construction-related short-term cumulative impacts to traffic and transportation (traffic congestion, access, and traffic safety).	LSM	LSM	LSM	LS

NOTES:

SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact

Impact 4.9.1: Project construction activities would intermittently and temporarily increase traffic congestion due to vehicle trips generated by construction workers and construction vehicles on area roadways. (Less than Significant with Mitigation for Alternatives 1, 2, and 3; Less than Significant for Alternative 4)

Alternative 1

As described in Chapter 3.0 Project Description and summarized in the impact methodology section above for construction, construction activities at all of the facility sites included in Alternative 1 could involve up to six construction crews of 50 to 70 workers each plus construction management personnel, for a total of up to 400 construction workers active on the project at one time. For purposes of impact analysis it is assumed that each construction worker makes one daily round-trip to and from the project area resulting in 400 round trips per day. An additional 100 round trips per day (25 percent of workers) are added to this count to reflect the assumption that some construction workers would make another trip to and from a construction site during the day (e.g., for lunch). Thus, for the peak construction activity period scenario it is

assumed that construction workers contribute a total of 500 round-trips per day to roads within the project area.

Projected equipment and materials needs were used to estimate truck trips required to support construction at each site. Materials hauling requirements for this project are minimized by several features of this project including: 1) most of the material required for the dam expansion would come from borrow areas within the CCWD watershed; 2) most of the material from the existing dam would be reused and any minor amounts of remaining material would be disposed of onsite within the reservoir inundation area; and 3) up to 75 percent of the materials removed from the pipeline trenches would be reused as backfill or spread out over adjacent range land, eliminating the need to haul this material off site for disposal or import additional backfill materials.

Construction equipment (refer to Table 3.7) would be delivered to and removed from each project facility site in phases for site clearing, grading, excavation and foundation work; structure and building construction; interior, mechanical and electrical work; and finally, for road work, utilities and site finishing / landscaping. Materials that need to be imported for project construction would include sand filters and gravel drains for the reservoir that would be imported from commercial sources within the region (expected haul distances of up to 30 miles), and for all facilities both raw and pre-fabricated materials that would be transported to the project site such as gravel, aggregate, bulk cement, steel, asphalt, pipeline segments, pre-fabricated building materials, and mechanical and electrical equipment. Materials to be removed from project facility sites would be limited to some building materials that could not be reused as part of facilities expansion and excess excavated material. Most of the excavated material is expected to be reused on site and extra materials would, in most cases, be used as clean fill on other development sites. In some instances it might be necessary to haul materials to a specific waste disposal site.

Appendix H presents a breakdown of the truck trip assumptions developed for each of the eight facilities included in Alternative 1 based on the construction scenario and basic facility design information: 1) reservoir expansion, 2) Transfer Facility expansion, 3) new Delta Intake and Pump Station, 4) Delta-Transfer Pipeline, 5) Transfer-LV Pipeline, 6) Transfer-Bethany Pipeline and South Bay Connection, 7) Power Supply (Option 1 or 2), and 8) Recreation facility replacement and expansion within the Los Vaqueros Watershed. In summary, under the peak construction activity scenario that assumes construction activity occurs on all eight facilities concurrently, total daily truck trips to the project area could total approximately 1,150 round-trips (2,300 one-way trips) per day. While it is assumed that construction crews would work two shifts per day for a total 16-hour work period between approximately the hours of 6 am and 10 pm, it is expected that materials and equipment would likely be delivered within a 10-hour, day-time period per day. Under this assumption, truck trips scheduled through out the day to deliver and remove materials from project facilities sites would average approximately 230 trips per hour.

Assuming concurrent construction at all project sites, the combination of construction worker commute and truck trips for equipment and materials hauling would generate the addition of approximately 1,650 daily round trips to the project area (up to 3,300 one-way trips per day). This

scenario reflects a conservative peak construction activity scenario for the extent of construction traffic that would be generated by the project.

Assessment of the short-term effect that project construction traffic could have on local and regional roads includes review of existing traffic volume information and consideration of both the percentage increase the project construction traffic would contribute over existing conditions and the capacity of the road to handle the additional traffic. Since the number of vehicles on roads vary from day-to-day and over the course of a day and routinely range plus or minus five percent, a change in traffic volume of five percent or less is generally not perceptible to the average motorist. Further, although in some cases project-generated construction traffic might represent more than a five percent increase in traffic volume over existing conditions, the effect on traffic flow is not substantial because traffic volumes would remain well within the design carrying capacity levels for these roads. As a reference point, depending on design features, the carrying capacity of a typical two lane local road is 20,000 to 25,000 vehicles per day. Traffic volume on project area roads is typically highest during morning and evening peak commute hours (generally between 7 am to 9 am and 4 pm to 6 pm); traffic increases that occur during these peak periods may exacerbate short-term congestion.

The main regional highways expected to be used to access the project area are I-5, I-205, and I-580, which would provide access to the project area from the east and south (see Figure 4.9-1 and Table 4.9-1). Some construction workers and trucks delivering equipment and materials would also come to the project area from the west, using I-680, I-580, and/or SR-4 but these are not expected to carry the majority of construction traffic for the project. The existing volume of traffic on I-580 is shown on Table 4.9-2; in the stretch of highway around the Vasco Road exit that leads to the project area, the existing average daily traffic volume ranges from 150,000 to 184,000 vehicles per day. Even if all 3,300 daily project construction trips used I-580, this level of short-term traffic increase would represent two percent or less of the existing traffic volume; as such this would not be a substantial traffic increase on major highways like I-580.

The main roads providing access from the highway system to the project area and access to specific facility sites include: Vasco Road, Byron Highway, SR-4 and the SR 4 Bypass (see Figure 4.9-1 and 4.9-2). Construction traffic to and from the eight different project facility sites would be distributed on each of the roads. For the three pipeline facilities, construction traffic would use different roads to access different portions of the alignments such that there is not a single point of access.

As shown on Figure 4.9-2, Vasco Road provides access to the Los Vaqueros Watershed, both the south and north entrances, and would be used by construction workers and truck haulers going to the dam expansion site and the recreation facility replacement and expansion sites within the watershed. Construction workers, equipment and materials haulers would use both the south and north entrance to the watershed. Vasco Road would also be used by project construction traffic going to and from the Transfer Station Expansion site, the Transfer-LV Pipeline and to access the western portion of the Delta-Transfer Pipeline route, Power Option 2, and the northern portion of the Transfer-Bethany Pipeline. Assuming concurrent construction at all sites and a concentration

of work being completed at facility sites accessed by Vasco Road, approximately two-thirds of the total project-generated construction trips, or 2,000 trips per day could occur on Vasco Road during the peak project construction period. Compared to the existing average daily traffic on Vasco Road (shown on Table 4.9-3), this would represent about a 10 percent increase in daily traffic during the peak construction period. On an hourly basis, this would represent an additional 200 trips per hour. In the off-peak commute hours, this additional traffic would not represent a substantial increase in traffic volume that would appreciably affect traffic congestion; however if this project construction traffic increase were to occur during the peak commute hours (typically 7 am to 9 am and 4 pm to 6 pm), then this could result in a noticeable increase in traffic congestion, and might delay emergency service providers traveling through this area as well.

Walnut Boulevard, which provides access from the north to the Los Vaqueros Watershed and connects with Vasco Road, carries a similar but slightly lower volume of existing daily traffic (18,000 trips per day; Table 4.9-3) compared to Vasco Road. Some construction workers and haul trucks would use this road for some project construction-related trips, though not to the extent expected to use Vasco Road. Project construction traffic impacts to Walnut Boulevard would be similar but less than that described above for the peak project construction traffic scenario for Vasco Road.

Byron Highway would provide access to the Delta-Transfer Pipeline alignment, the new Delta Intake and Pump Station, Power Option 1 and portions of Power Option 2, and most of the Transfer-Bethany Pipeline. Similar to the assumptions made about the use of Vasco Road, assuming concurrent construction activity on all project sites accessed by Byron Highway, about one-third of the total estimated construction traffic, a maximum of approximately 1,250 trips per day, would use this road. This represents about 125 trips per hour, or about an eleven percent increase in the existing average daily traffic volume on this highway (see Table 4.9-3). In the off-peak commute hours, this additional traffic would not represent a substantial increase in traffic volume that would appreciably affect traffic congestion; however if this project construction traffic increase were to occur during the peak commute hours (typically 7 am to 9 am and 4 pm to 6 pm), then this could result in a noticeable increase in traffic congestion.

SR 4, in the segment west of Old River to Byron Highway, would be used to access the new Delta Intake and Pump Station site and the eastern portion of the Delta-Transfer Pipeline. Peak project construction traffic associated with these two facilities would total about 708 trips per day, or an average of 78 additional trips per hour. Compared to existing average daily traffic volumes for SR 4 in the reach between Byron Highway and the San Joaquin County line to the east, the project could contribute an increase of 4 to 7 percent (See Table 4.9-2). As for Vasco Road and the Byron Highway, while this is not a substantial traffic flow increase for this roadway, if this project construction traffic increase were to occur during the peak commute hours, then this could result in a noticeable increase in traffic congestion, and might cause delays for emergency service providers traveling through this area as well.

For the smaller, more local roads in the project area such as Hoffman Road, Byron Hot Springs, and Armstrong Road, project-related construction traffic would use these roads to access a

specific facility site. Hoffman Road provides local access to the western end of Delta-Transfer Pipeline; both Byron Hot Springs Road and Armstrong Road would be used to access portions of the Transfer-Bethany Pipeline alignment. Existing traffic on these roads is light. Project construction traffic could represent a noticeable percentage increase in traffic on these roads but the total traffic including project construction vehicles trips would remain well below the road capacity and would not result in congested traffic flow conditions.

With respect to project construction effects on existing bus transit services, Eastern Contra Costa Transit Authority operates a regional bus route that uses the Byron Highway and LAVTA operates a route that extends into North Livermore along Vasco Road about one mile north of I-580. The short-term traffic increases that would occur on these roads during project construction would not disrupt transit service but, as noted, above, traffic increases during morning and evening peak commute hours could increase traffic congestion and add to transit delays. Mitigation measures are proposed to minimize project construction traffic during peak commute hours.

Alternative 2

Alternative 2 project components would be the same as those proposed under Alternative 1; therefore, potential projected-related traffic impacts on traffic flow and congestion, would be the same as described above for Alternative 1. During morning and evening peak commute hours, project-related construction traffic could cause a substantial increase in traffic and congestion conditions.

Alternative 3

Impacts under Alternative 3 would be less than those analyzed under Alternative 1, above. Under this alternative, the Old River Intake and Pump Station would be expanded instead of constructing the new Delta Intake and Pump Station. In addition, there would be no construction of a Transfer-Bethany Pipeline. All other facilities would be as proposed under Alternative 1. Consequently, Alternative 3 would generate total estimated peak construction period traffic of about 2,340, or about 70 percent of the amount estimated for Alternative 1. Without construction of the new Delta Intake and Pump Station or the Transfer-Bethany Pipeline it is expected that Byron Highway would receive less project construction traffic than under Alternative 1, although this road would still be used to some extent by construction traffic accessing the project area and specific project sites such as the Delta-Transfer Pipeline alignment.

Since this alternative still includes expansion of the reservoir to 275 TAF, expansion of the Transfer Facility and construction of the Delta-Transfer and Transfer-LV Pipelines along with additional power, Vasco Road, Walnut Boulevard, and Camino Diablo would experience similar though lower levels of project construction traffic increases as described for Alternative 1. Other roads affected by project construction traffic increases under Alternative 1 would not be affected under Alternative 3 including Byron Hot Springs Road, and Armstrong Road. Although Alternative 3 would generate less project construction traffic than Alternative 1, project construction traffic could still add to congestion on project area roads, particularly during

morning and evening peak commute periods. Therefore, mitigation measures are also proposed for this alternative to minimize peak hour traffic increases.

Alternative 4

Impacts under Alternative 4 would be substantially less than those analyzed under Alternative 1 because this alternative involves construction of a smaller reservoir expansion and upgrade but not expansion of the Transfer Facility and does not include any of the other major intake or pipeline facilities proposed under Alternative 1. The total estimated peak construction period traffic for this alternative would be approximately 425 vehicle trips per day, or about 13 percent of the amount of peak construction traffic estimated for Alternative 1. Under this alternative construction activity would occur primarily within the Los Vaqueros Watershed and the main access roads used would be Vasco Road and Walnut Boulevard, with some use of Byron Highway, SR 4, SR 4 Bypass, and Camino Diablo also expected. The level of traffic increases associated with project construction activity under this alternative would not be substantial enough to cause significant delays in traffic, including transit or emergency service providers. Project construction traffic effects would be less than significant and no mitigation is required.

Mitigation Measure

Measure 4.9.1a: Schedule project generated construction truck trips on Vasco Road, Byron Highway, SR 4, and SR 4 Bypass outside the peak morning and evening commute hours such that the frequency of construction truck trips on these roads would be no greater than one every two minutes (i.e., 30 trucks per hour) during these peak commute periods.

Measure 4.9.1b: Develop and implement a construction truck hauling plan that designates specific routes to be used to access the various project facilities when multiple facility sites are under construction concurrently so that project-generated construction traffic is dispersed over a number of roads in the project area.

Impact Significance after Mitigation: Less than Significant.

Impact 4.9.2: Project construction activities would intermittently and temporarily impede access to local streets or adjacent uses, including access for emergency vehicles and could substantially increase traffic hazards due to construction in or adjacent to roads or due to possible road wear. (Less than Significant with Mitigation for Alternatives 1, 2, and 3; Less than Significant for Alternative 4)

Alternative 1

Alternative 1 would involve construction of new pipelines and powerlines adjacent to, and in a few instances across, local roads in the project area. Although project pipelines and supporting electrical transmission powerlines are not proposed for construction directly within the paved travel lanes, project construction adjacent to roads could result in some road restrictions that affect the vehicle travel lanes in order to provide adequate construction work area adjacent to the roadway and/or adequate access to the construction right-of-way. Such major construction

activity along roadways could create traffic safety hazards. In addition, construction adjacent to roadways would temporarily block vehicle, bicycle and pedestrian access to local streets or property driveways, including access for emergency vehicles. Finally, construction activity along roads as well as heavy truck traffic delivering equipment and materials to other facilities sites could result in road wear and damage that result in a driving safety hazard.

The Delta-Transfer Pipeline would be constructed adjacent to portions of SR 4 in the reach west of Old River to about Bixler and along a portion of Hoffman Road. The Transfer-LV Pipeline would be constructed along the southern end of Walnut Boulevard before it enters the Los Vaqueros Watershed. The Transfer-Bethany Pipeline would be constructed long the northern end of Vasco Road and along a segment of Armstrong Road. Under Power Option 2, an additional powerline would be extended along Hoffman Road, adjacent to the Delta-Transfer Pipeline. Construction along these roadways would restrict access to adjacent properties, which are primarily rural residences and farmland.

The use of trucks to transport equipment and material to and from the project work sites could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the existing roadway design (pavement type and thickness) and existing condition of the road. Freeways, major arterials and collectors (e.g., I-580, SR 4, SR 4 Bypass, Byron Highway, and Vasco Road) are designed to accommodate a mix of vehicle types, including heavy trucks. The project's impacts are expected to be negligible on those roads. However, rural roadways may not have been constructed to support the weight and use of large construction equipment. Construction damage on designated haul routes used by construction vehicles would be a significant impact.

During the 36-month construction period, trucks delivering materials and equipment and removing debris would be entering and exiting unpaved areas along SR 4, Vasco Road, Camino Diablo, and Walnut Boulevard. In some areas this could create a traffic safety hazard requiring the need for traffic control. At times the presence of slow-moving trucks entering or exiting construction areas along roadways could pose a traffic hazard to other vehicles. The creation of potential traffic safety hazards as a result of project construction would be a significant impact.

Alternative 2

Alternative 2 project components would be the same as those proposed under Alternative 1; therefore, impacts would be the same as described above for Alternative 1.

Alternative 3

Under Alternative 3 the Delta-Transfer Pipeline, Transfer-LV Pipeline and Power Option 2 facilities would be constructed adjacent to project area roads as described under Alternative 1. The Transfer-Bethany Pipeline would not be constructed and thus there would be no construction adjacent to Vasco Road, Armstrong Road and Byron Hot Springs Road under this alternative. Construction adjacent to roadways could create a traffic safety hazard and would also restrict access to adjacent properties, including emergency service access. In addition to project

construction activities adjacent to roads, like Alternative 1, under this alternative slow moving construction haul trucks entering and exiting project facility sites, particularly unpaved areas, could pose a traffic safety hazard and road wear due to heavy truck traffic could also result in a driving hazard. This impact would be significant.

Alternative 4

Construction activity under Alternative 4 would not create significant traffic safety hazards because there would be no construction adjacent to public roads that would create a driving hazard or restrict access to adjacent properties. In addition, this alternative would generate limited construction truck traffic compared to Alternative 1 and would not represent a significant traffic safety hazard or be expected to result in road wear that would create a driving hazard. The impact under this alternative would be less than significant.

Mitigation Measure

Measure 4.9.2a: Maintain alternative property access or trench plates on site to restore access for emergency vehicles at all times.

Measure 4.9.2b: 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 area roadways.

Measure 4.9.2c: Install traffic control devices as specified in Caltrans' Manual of Traffic Controls for Construction and Maintenance Work Zones where needed to maintain safe driving conditions. This measure includes the use of signage to alert motorists of construction activities, potential hazards and travel detours as well as the use of flaggers when appropriate.

Measure 4.9.2d: Prior to construction, CCWD or its contractors will survey and describe the pre-construction roadway conditions on rural roadways and residential streets (including, but not limited to, Walnut Boulevard and Camino Diablo). Within 30 days after construction is completed, CCWD will survey these same roadways and residential streets in order to identify any damage that has occurred. Roads damaged by construction will be repaired to a structural condition equal to the condition that existed prior to construction activity.

Impact Significance after Mitigation: Less than Significant.

Impact 4.9.3: Traffic associated with operation of project facilities under all alternatives, including the expanded recreational facilities, would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways. (Less than Significant)

Alternative 1

Operation of the expanded Los Vaqueros Reservoir system facilities under Alternative 1 is projected to require only a few additional employees, less than ten. As a result, the project would

result in negligible additional worker commute trips. In addition, maintenance and inspection of the expanded system facilities would be incorporated into the existing system operations and maintenance effort. Under Alternative 1 the new Delta Intake and Pump Station would be added to the District staff rounds for routine inspection. Day-to-day operations of this facility would be managed remotely and no employees would be permanently located at this new intake facility. The new pipelines added to the system under this alternative would be inspected as part of the District's routine system inspection effort. Since the Delta-Transfer and Transfer-LV Pipelines would parallel existing system pipelines, only the Transfer-Bethany Pipeline would add new territory for District maintenance staff to cover. Traffic trips for inspection and maintenance of the expanded system under Alternative 1 would result in a negligible increase in traffic trips on project area roads.

Traffic associated with operation of project facilities would also be generated by visitors to the expanded recreation facilities within the Los Vaqueros Watershed. Under Alternative 1, recreational facilities would be relocated and/or new facilities constructed to replace and expand the recreational facilities that would be displaced with the Los Vaqueros Reservoir Expansion Project. This includes the relocation of existing hiking trails and access roads along with installation of additional access roads and hiking trails and the relocation/addition of other facilities (i.e., fishing piers, picnic areas, restrooms and parking). Under Alternative 1, the major change would involve relocation of the Marina from the south end to the north end of the reservoir, with construction of a new Marina Complex plus an interpretive center and amphitheatre.

The majority of visitors to the watershed are fisherman as well as school-age children that participate in week-day educational programs sponsored by CCWD. Los Vaqueros Reservoir competes with other fishing locations in the region, most notably the Delta, for visitors. Although visitation to the Los Vaqueros Watershed may increase some in the future as population increases in the eastern Contra Costa County and Alameda County communities, this would be expected to occur with or without the project. The replacement and enhancement/expansion of recreation facilities proposed under this project alternative is not projected to result in significant additional recreational visitors to the watershed.

The most recent visitor data (attendance by month) for the six-year period July 2001 through June 2007 indicate that annual attendance at the Los Vaqueros Watershed ranged from about 18,000 to 29,000 visitors, with highest attendance during the spring and autumn. Data gathered between September 2001 and June 2002 (the most recent available information concerning point of origin) indicate that about 74 percent of the visitors to the reservoir use the south entrance. The proposed relocation of the Marina to the north end of the reservoir would shift vehicle access patterns on roadways in the project area. Information indicates that the origin of visitor trips is split equally between north/northwest and south/southwest of the reservoir. Thus, even with the relocation of Marina to the north end, the total two-way visitor-generated traffic volumes on area roads (e.g., Vasco Road, Marsh Creek Road, and I-580) would be similar to current conditions, that is – approximately half of the visitors would drive to the watershed from the north and the other would drive from the south. Traffic would not increase appreciably on the segment

of Vasco Road between the southern watershed entrance and Walnut Boulevard, the northern watershed entrance. Visitors who live south/southwest of the reservoir would travel on northbound Vasco Road northeast of the existing Marina to reach the new Marina Complex on the north (an increase in traffic volume on Vasco Road), but visitors who live north/northwest of the reservoir would no longer travel on southbound Vasco Road to the existing Marina entrance location (a decrease in traffic volume on Vasco Road).

Traffic volumes might increase slightly on the roads providing direct access to the new Marina Complex (i.e., Camino Diablo, Walnut Boulevard and Los Vaqueros Road), but only by the amount of traffic currently using two-lane Los Vaqueros Road to access the existing southern Marina location. That amount of traffic varies from day to day, and season to season, but recent CCWD quarterly visitation reports indicate that between 900 and 2,000 people obtained fishing passes each month during the six-month period from July through December 2007. The maximum number of people per day over that period would be about 66 people. The impact of vehicle trips by those 66 people, spread over the course of a day, would be less than significant.

Alternative 2

Alternative 2 recreational components would be the same as those proposed under Alternative 1; therefore, impacts would be the same as described above for Alternative 1. Impacts would be less than significant under Alternative 2.

Alternative 3

Like Alternative 1, Alternative 3 would expand the existing reservoir to 275 TAF and result in construction of a new Marina Complex, interpretive center and additional trails. These recreational components would be the same as those proposed under Alternative 1; therefore, impacts would be the same as described above for Alternative 1, less than significant.

Alternative 4

Effects related to recreational traffic under Alternative 4 would be substantially less than those analyzed under Alternative 1 because Alternative 4 would not result in construction of a Marina Complex or a new interpretive center on the north end of the watershed. There would be no change in traffic patterns because the Marina would remain in an area accessed from the south, the same as existing conditions. Impacts would be less than significant under Alternative 4.

Mitigation: None required.

Impact 4.9.4: Construction of the project alternatives, when combined with construction of other future projects, could contribute to construction-related short-term cumulative impacts to traffic and transportation (traffic congestion, access, parking, traffic safety, and pavement wear-and-tear). (Less than Significant with Mitigation)

All Alternatives

The geographic scope of potential cumulative traffic impacts includes access routes to area freeways, and arterial and collector roadways used for haul routes and construction equipment/vehicle access to the Los Vaqueros Reservoir Expansion Project sites. Locating and operating the facilities associated with the project alternatives, described above, would not result in long-term traffic-related impacts. However, Impact 4.9.1 identifies short-term increases in traffic volumes associated with construction of the project facilities. Additional construction-related traffic impacts include temporary increases in traffic congestion, temporary and intermittent impedances to access and increased potential for traffic safety hazards. These impacts would be temporary, occurring during the estimated 36 month construction period.

The project has the potential to contribute incrementally to cumulative construction-related impacts as a result of (1) cumulative projects that generate increased traffic at the same time on the same roads as would the project facilities, causing increased congestion and delays such as land development projects; and (2) infrastructure projects in roads that would be used by project construction workers and trucks, which could affect detour routes around project work zones or could delay project-generated vehicles past the work zones of those other projects.

A review of planned development and infrastructure improvement projects in the project area indicate a few projects that could also generate construction-related traffic impacts at the time that the Los Vaqueros Reservoir Expansion Project is under construction (see Table 4.1-2). Implementation of circulation and detour plans, installing traffic control devices, and scheduling, to the extent feasible, truck trips outside of peak morning and evening commute hours (as identified for the project alternatives in Mitigation Measure 4.9.1) would reduce the project's contribution to the cumulative impacts. However, some traffic disruption and increased delays would still occur during project construction, even with mitigation. Given the lack of certainty about the timing (and identification) of other projects, specifically what projects would be constructed during construction of the project alternatives (2012-2015+), it is prudent to conclude that significant cumulative traffic and circulation impacts could occur and that impacts would be significant.

Mitigation Measure

Measure 4.9.4: Prior to construction, CCWD will coordinate with the appropriate local government departments in Brentwood, Contra Costa County, Alameda County, and Caltrans, and with utility districts and agencies regarding the timing of construction projects that would occur near project sites. Specific measures to mitigate potential significant impacts will be determined as part of the interagency coordination, and could include measures such as employing flaggers during key construction periods, designating alternate haul routes, and providing more outreach and community noticing.

Impact Significance after Mitigation: Less than Significant.

4.10 Air Quality

This section describes existing air quality within the project area and surrounding region, describes the associated regulatory framework, presents an analysis of potential impacts on air quality that would result from implementation of the proposed project and alternatives, and identifies mitigation measures.

4.10.1 Affected Environment

Because the project alternatives are all located within the same air basin, the air quality setting is identical for all alternatives. The affected environment section describes the regulatory setting and the existing air quality conditions in the project area.

Regulatory Setting

Air quality management exists at federal, state, and local levels of government. Air quality planning programs have generally been developed in response to requirements established by the federal Clean Air Act (CAA) of 1972 and subsequent amendments to the act; however, the enactment of the California Clean Air Act (CCAA) of 1988 produced additional changes in the structure and administration of air quality management programs in California.

Federal

The federal CAA requires the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. National standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter (PM10 and PM2.5[1]), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet the specific public health and welfare criteria set forth in the CAA. California has adopted more stringent ambient air quality standards for the criteria air pollutants (referred to as California Ambient Air Quality Standards [CAAQS], or state standards) and has adopted air quality standards for some pollutants for which there is no corresponding national standard. **Table 4.10-1** provides a brief discussion of the related health effects and principal sources for each criteria air pollutant. **Table 4.10-2** presents current national and state ambient air quality standards and attainment status(es). Currently, there are no federal or state ambient air quality standards for any of the six greenhouse gases.[2]

The 1977 amendments to the CAA required the U.S. EPA to identify National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Control of HAPs (known as Toxic Air Contaminants (TACs) under California regulations) is achieved through federal, state and local controls on individual sources.

1 PM10 and PM2.5 consist of particulate matter that is 10 microns (a micron is one-millionth of a meter) or less in diameter and 2.5 microns or less in diameter, respectively.

2 The six greenhouse gases are CO_2, methane, (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

TABLE 4.10-1
STATE AND FEDERAL CRITERIA AIR POLLUTANT
SOURCES AND HEALTH EFFECTS

Pollutant	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NOx) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, and is destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM10)	May irritate eyes and respiratory tract, decrease lung capacity, and cause cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter (PM2.5)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
Lead	Disturbs gastrointestinal system and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing, and recycling facilities. Past source: combustion of leaded gasoline.
Hydrogen Sulfide	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal Power Plants, Petroleum Production and refining
Sulfates	Breathing difficulties, aggravates asthma, reduced visibility	Produced by the reaction in the air of SO2.
Visibility Reducing Particles	Reduces visibility, reduced airport safety, lower real estate value, discourages tourism.	See PM2.5.

SOURCE: CARB, 2005a.

TABLE 4.10-2
STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS

Pollutant	Averaging Time	California Standards[a]		National Standards[b]	
		Concentration	Attainment Status	Concentration[c]	Attainment Status
Ozone	1 hour	0.09 ppm	N	–	–[d]
	8 hours	0.070 ppm	N[e]	0.075 ppm	N[f]
Carbon Monoxide	1 hour	20 ppm	A	35 ppm	A
	8 hours	9.0 ppm	A	9 ppm	A[g]
Nitrogen Dioxide	1 hour	0.18 ppm	A	–	–
	Annual Avg.	0.030 ppm	–	0.053 ppm	A
Sulfur Dioxide	1 hour	0.25 ppm	A	–	–
	24 hours	0.04 ppm	A	0.14 ppm	A
	Annual Avg.	–	–	0.03 ppm	A
Respirable Particulate Matter (PM10)	24 hours	50 µg/m^3	N	150 µg/m^3	U
	Annual Avg.	20 µg/m^3	N[h]	–	A
Fine Particulate Matter (PM2.5)	24 hours	–	–	35 µg/m^3	U[i]
	Annual Avg.	12 µg/m^3	N[h]	15 µg/m^3	A
Lead	Monthly	1.5 µg/m^3	A	–	–
	Quarterly	–	–	1.5 µg/m^3	A
Hydrogen Sulfide	1 hour	0.03 ppm	U	–	–
Sulfates	24 hour	25 µg/m^3	A	–	–
Vinyl Chloride	24 hour	0.010 ppm	–	–	–
Visibility-Reducing Particles	8 hour	–[j]	A	–	–

A=Attainment N=Nonattainment U=Unclassified
mg/m^3=milligrams per cubic meter
ppm=parts per million
µg/m^3=micrograms per cubic meter

[a] California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility-reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average.

[b] National standards other than for ozone, particulates, and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentrations is 0.08 ppm or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than 65 µg/m^3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM10 is met if the 3-year average falls below the standard at every site. The annual PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

[c] National air quality standards are set at levels determined to be protective of public health with an adequate margin of safety. Each state must attain these standards no later than three years after that state's implementation plan is approved by the U.S. EPA.

[d] The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

[e] This standard was approved by the CARB on April 28, 2005, and became effective on May 17, 2006.

[f] In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. US EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (i.e., 75 ppb) effective May 27, 2008. EPA will issue final designations based upon the new 0.75 ppm ozone standard by March 2010.

[g] In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

[h] In June 2002, CARB established new annual standards for PM2.5 and PM10.

[i] U.S. EPA lowered the 24-hour PM2.5 standard from 65 µg/m^3 to 35 µg/m^3 in 2006. EPA has not yet determined the attainment status of BAAQMD for the new standard.

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

SOURCE: BAAQMD, 2008.

Federal Attainment Status

Pursuant to the 1990 federal CAA amendments, the U.S. EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. Los Vaqueros Reservoir is located in Contra Costa County and is within the boundaries of the San Francisco Bay Area Air Basin. The Bay Area is in attainment or unclassified for all federal criteria pollutant standards, except for the 8-hour ozone standard, which is classified as marginal nonattainment for the national standard. "Unclassified" is defined in the CAA Amendments as any area that cannot be classified on the basis of available information as meeting or not meeting the national primary and secondary air quality standard for the specified pollutant.

Federal Conformity Requirements

Federal projects are subject to either the Transportation Conformity Rule (40 Code of Federal Regulations [CFR], Part 51, Subpart T), which applies to federal highway and transit projects, or the General Conformity Rule (40 CFR, Part 51, Subpart W), which applies to all other federal projects. Because the proposed project and alternatives are not a federal highway or transit project, it is subject to the General Conformity Rule.

The purpose of the General Conformity Rule is to ensure that federal projects conform to applicable state implementation plans (SIPs) so that they do not interfere with strategies employed to attain the National Ambient Air Quality Standards (NAAQS). The rule applies to federal projects in nonattainment areas for any of six criteria pollutants for which the U.S. EPA has established these national standards and in areas designated as "maintenance" areas (an area with a maintenance plan, which is a revision to the applicable SIP, meeting the requirements of section 175A of the CAA). The rule covers direct and indirect emissions of criteria pollutants or their precursors that result from a federal project, are reasonably foreseeable, and can be practicably controlled by the federal agency through its continuing program responsibility. The rule applies to all federal projects, including project approvals, and funding, except:

- Projects specifically included in a transportation plan or program that is found to conform under the federal transportation conformity rule
- Projects with associated emissions below specified "*de minimis*" threshold levels (i.e., levels beyond which an air quality effect is considered significant)
- Certain other projects that are exempt or presumed to conform, listed in 40 CFR, Part 51, Subpart W.

Sources that are exempt include those that require a permit under the New Source Review or Prevention of Significant Deterioration program. Projects presumed to conform are those that are presumed to result in insignificant quantities of emissions, including routine maintenance and repair, routine operations, and prescribed burning.

The San Francisco Bay Area, including the project study area, is in marginal nonattainment of the federal 8-hour ozone standard and moderate maintenance of the federal carbon monoxide standard. The applicable *de minimis* thresholds are 100 tons per year of ROG, NOx, and carbon

monoxide. If the project would result in total direct and indirect emissions in excess of the *de minimis* emission rates, it must be demonstrated through conformity determination procedures that the emissions conform to the applicable SIP for each affected pollutant.

A federal project that does not exceed the *de minimis* threshold rates may still be subject to a general conformity determination if the sum of direct and indirect emissions would exceed 10 percent of the emissions of the nonattainment or maintenance area. If emissions would exceed 10 percent, the federal project is considered "regionally significant," and thus general conformity rules apply. This allows regulatory agencies to address those federal projects that would not exceed the *de minimis* levels but would have the potential to adversely affect the air quality of a region. If the emissions would not exceed the *de minimis* levels and are not regionally significant, then the project is assumed to conform, and no further analysis or determination is required.

State

The California Air Resources Board (CARB) manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional air pollution control districts and air quality management districts. CARB regulates local air quality indirectly by establishing state ambient air quality standards and vehicle emissions and fuel standards and by conducting research, planning, and coordinating activities.

The CAA requires each state to prepare a SIP, a planning document containing emission inventories, emission standards for motor vehicles and consumer products, and attainment plans adopted by local districts and approved by CARB for inclusion in the SIP. The U.S. EPA must review each SIP to determine its compliance with the federal CAA and air quality standards. Amendments to the CAA further require states containing areas that are in nonattainment for NAAQS to amend their SIPs to add additional control measures. Although the state prepares the majority of the SIP, local districts are responsible for adopting air quality attainment plans that are included in the SIP. Each attainment plan must demonstrate its compliance with the CAA and CCAA air quality standards.

Pursuant to Section 39606(b) of the California Health and Safety Code, California has adopted ambient standards that are more stringent than the national standards for some criteria air pollutants (e.g., PM10 daily and annual average standards). In July 2003, CARB's new annual standards for PM10 and PM2.5 took effect. The annual PM10 standard was revised from 30 to 20 micrograms per cubic meter ($\mu g/m^3$), and the annual PM2.5 standard was revised from 15 to 12 $\mu g/m^3$. The state standards are shown in Table 4.10-2.

Toxic Air Contaminants

California law defines TACs as air pollutants having carcinogenic effects. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807. A total of 243 substances have been designated as TACs under California law; they include the 189 federal HAPs adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; AB 2588 does not regulate air toxics emissions.

Diesel Particulate Emissions

In August of 1998, CARB identified particulate emissions from diesel-fueled engines (diesel particulate matter, or DPM) as TACs. In 2000, CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000). The document represents a proposal to reduce diesel particulate emissions, with the goal of reducing emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra-low sulfur diesel fuel on diesel-fueled engines. CARB regulations and programs that have been implemented to achieve these goals and that would apply to the project include the following (CARB, 2004):

- **Cleaner Diesel Fuel:** In 2003, the CARB adopted a new regulation lowering the sulfur content of diesel fuel to enable the use of advanced emission control technologies for diesel engines.

- **Standards for New On-Road Diesel Engines:** In 2001, CARB adopted new particulate matter (PM) and NOx emission standards to clean up large diesel engines that power big-rig trucks, trash trucks, delivery vans, and other large vehicles. These standards took effect in 2007 and will reduce DPM emissions by over 90 percent compared with new on-road engines previously sold in California.

- **Standards for New Off-Road Diesel Engines:** In 2004, CARB adopted a new off-road diesel engine emission standards (Tier 4) nearly identical to those adopted by the U.S EPA on May 11, 2004 under the Clean Air Nonroad Diesel Rule. These standards will reduce DPM emission by over 90 percent compared with new off-road engines currently sold in California. New engine standards take effect, based on engine horsepower, starting in 2008. In conjunction, sulfur levels will be reduced in nonroad diesel fuel by 99 percent from current levels by the year 2010.

- **New Regulations for In-Use Diesel Engines:**

  - *Stationary Engines Standards (adopted 2004):* Most stationary diesel-fueled engines in California are used as emergency backup in the event of a power failure. Others are used to pump water in some areas, to run compressors, and to operate other equipment. CARB standards for these engines will bring an approximate 80 percent PM reduction by 2020 through stricter standards for new engines and requirements to retrofit existing engines.

  - *Portable Engines Standards (adopted 2004):* Most portable diesel engines in California are used to power pumps, airport ground support equipment, oil drilling rigs, generators, and a variety of other equipment. CARB's rule requires four stepped reductions in emissions from portable engines, reaching a 95 percent reduction in PM emissions in 2020 with concurrent significant cuts in smog-forming emissions.

- **Carl Moyer Incentive Program:** The Carl Moyer Program was established in 1999 to offer monetary incentives to reduce NOx emissions from diesel engines. These increases in emissions from electricity use would be minimized by implementing the project design features discussed below.

CARB Handbook

CARB recently published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005b). The primary goal in developing the handbook was to provide information that will help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution. The handbook highlights recent studies that have shown that public exposure to air pollution can be substantially elevated near freeways and certain other facilities. However, the health risk is greatly reduced with distance. For that reason, CARB provided some general recommendations aimed at keeping appropriate distances between sources of air pollution and sensitive land uses, such as residences. The project would not conflict with any of the general recommendations.

State Attainment Status

Under the CCAA, which has been patterned after the federal CAA, areas are designated as attainment or nonattainment with respect to the state standards. The Bay Area is designated as nonattainment for state ozone, PM10, and PM2.5 standards (BAAQMD, 2008). The Bay Area is designated as attainment for all other criteria pollutants.

AB 32, Reduction of Greenhouse Gases

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

- By 2010, reduce greenhouse gas emissions to 2000 levels
- By 2020, reduce greenhouse gas emissions to 1990 levels
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide greenhouse gas emissions are reduced to 1990 levels by 2020 (representing an approximate 25 percent reduction in emissions).

In June 2007, CARB directed staff to pursue 37 early actions for reducing greenhouse gas emissions under the California Global Warming Solutions Act. The broad spectrum of strategies to be developed—including a Low Carbon Fuel Standard, regulations for refrigerants with high global warming potentials, guidance and protocols for local governments to facilitate greenhouse gas reductions, and green ports (provide an alternative source of power for ships while they are docked)—reflects that the serious threat of climate change requires action as soon as possible (CARB, 2007a). In addition to approving the 37 greenhouse gas reduction strategies, CARB directed staff to further evaluate early action recommendations made at the June 2007 meeting, and to report back to CARB within six months. The general sentiment of CARB suggested a desire to try to pursue greater greenhouse gas emissions reductions in California in the near-term. Since the June 2007 CARB hearing, CARB staff has evaluated all 48 recommendations submitted

by several stakeholder and several internally-generated staff ideas and published the *Expanded List of Early Action Measures To Reduce Greenhouse Gas Emissions In California Recommended For Board Consideration* in October 2007 (CARB, 2007b). Based on its additional analysis, CARB staff is recommending the expansion of the early action list to a total of 44 measures, which are presented in **Table 4.10-3**. The measures that are applicable to the proposed project and alternatives are highlighted. As indicated, most of these measures are not applicable to a project but five measures could be applicable. These measures include (1) above ground storage tanks for fuels (during proposed project construction activities); (2) non-agricultural diesel off-road equipment (during proposed project construction activities); (3) privately owned on-road diesel trucks (primarily during proposed project construction activities); (4) anti-idling enforcement of heavy trucks (during proposed project construction activities); and (5) tire inflation program (during proposed project construction and operational activities).

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons of CO_2 equivalents of greenhouse gases. The 2020 target of 427 million metric tons of CO_2 equivalent (CO_2E) requires the reduction of 169 million metric tons of CO_2E, or approximately 30 percent, from the state's projected 2020 emissions of 596 million metric tons of CO_2E (business-as-usual).

Also in December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations will become effective January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. Currently, the draft regulation language identifies major facilities as those that generate more than 25,000 metric tons/year of CO_2E. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2E, make up 94 percent of the point source CO_2E emissions in California (CARB, 2007c).

In June, 2008, CARB published its Climate Change Draft Scoping Plan. The Draft Scoping Plan reported that CARB met the first milestones set by AB 32 in 2007: developing a list of early actions to begin sharply reducing greenhouse gas emissions; assembling an inventory of historic emissions; and establishing the 2020 emissions limit. After consideration of public comment and further analysis, CARB released the Climate Change Proposed Scoping Plan in October, 2008. The Proposed Scoping Plan proposes a comprehensive set of actions designed to reduce overall carbon emissions in California. Key elements of the Proposed Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

TABLE 4.10-3
CARB RECOMMENDED AB32 GREENHOUSE GAS MEASURES TO BE INITIATED BY CARB BETWEEN 2007 AND 2012

ID #	Sector	Strategy Name	ID #	Sector	Strategy Name
1	Fuels	Above Ground Storage Tanks	23	Commercial	SF_6 reductions from the non-electric sector
2	Transportation	Diesel – Offroad equipment (non-agricultural)	24	Transportation	Tire inflation program
3	Forestry	Forestry protocol endorsement	25	Transportation	Cool automobile paints
4	Transportation	Diesel – Port trucks	26	Cement	Cement (A): Blended cements
5	Transportation	Diesel – Vessel main engine fuel specifications	27	Cement	Cement (B): Energy efficiency of California cement facilities
6	Transportation	Diesel – Commercial harbor craft	28	Transportation	Ban on HFC release from Motor Vehicle AC service / dismantling
7	Transportation	Green ports	29	Transportation	Diesel – offroad equipment (agricultural)
8	Agriculture	Manure management (methane digester protocol)	30	Transportation	Add AC leak tightness test and repair to Smog Check
9	Education	Local gov. Greenhouse Gas (GHG) reduction guidance / protocols	31	Agriculture	Research on GHG reductions from nitrogen land applications
10	Education	Business GHG reduction guidance / protocols	32	Commercial	Specifications for commercial refrigeration
11	Energy Efficiency	Cool communities program	33	Oil and Gas	Reduction in venting / leaks from oil and gas systems
12	Commercial	Reduce high Global Warming Potential (GWP) GHGs in products	34	Transportation	Requirement of low-GWP GHGs for new Motor Vehicle ACs
13	Commercial	Reduction of PFCs from semiconductor industry	35	Transportation	Hybridization of medium and heavy-duty diesel vehicles
14	Transportation	SmartWay truck efficiency	36	Electricity	Reduction of SF_6 in electricity generation
15	Transportation	Low Carbon Fuel Standard (LCFS)	37	Commercial	High GWP refrigerant tracking, reporting and recovery program
16	Transportation	Reduction of HFC-134a from DIY Motor Vehicle AC servicing	38	Commercial	Foam recovery / destruction program
17	Waste	Improved landfill gas capture	39	Fire Suppression	Alternative suppressants in fire protection systems
18	Fuels	Gasoline disperser hose replacement	40	Transportation	Strengthen light-duty vehicle standards
19	Flues	Portable outboard marine tanks	41	Transportation	Truck stop electrification with incentives for truckers
20	Transportation	Standards for off-cycle driving conditions	42	Transportation	Diesel – Vessel speed reductions
21	Transportation	Diesel – Privately owned on-road trucks	43	Transportation	Transportation refrigeration – electric standby
22	Transportation	Anti-idling enforcement	44	Agriculture	Electrification of stationary agricultural engines

NOTE: Highlighted measures would be applicable to the proposed project.

SOURCE: CARB, 2007a.

- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation. (CARB, 2008)

The Proposed Scoping Plan notes that "[a]fter Board approval of this plan, the measures in it will be developed and adopted through the normal rulemaking process, with public input" (CARB, 2008).

The Proposed Scoping Plan states that local governments are "essential partners" in the effort to reduce greenhouse gas emissions, and that they have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to greenhouse gas emissions. It encourages local governments to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020 (CARB, 2008).

Senate Bill 97

The provisions of Senate Bill 97, enacted in August 2007 as part of the State Budget negotiations, direct the Office of Planning and Research (OPR) to propose CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." SB 97 directs OPR to develop such guidelines by July 2009, and directs the State Resources Agency, the agency charged with adopting the CEQA Guidelines, to certify and adopt such guidelines by January 2010.

OPR Technical Advisory, CEQA and Climate Change

On June 19, 2008, OPR published a technical advisory on CEQA and Climate Change (OPR, 2008). The technical advisory is one in a series of advisories published by OPR as a service to professional planners, land use officials and CEQA practitioners. The advisory provides OPR's perspective on the emerging role of CEQA in addressing climate change and greenhouse gas emissions, while recognizing that approaches and methodologies for calculating greenhouse gas emissions and addressing environmental impacts through CEQA review are rapidly evolving. The advisory recognizes that OPR will develop, and the Resources Agency will adopt amendments to the CEQA Guidelines pursuant to SB 97. In the interim, the technical advisory "offers informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents" (OPR, 2008).

The technical advisory points out that neither CEQA nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. "This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable" (OPR, 2008). OPR recommends that "the global nature of climate change warrants investigation of a statewide threshold of significance for GHG emissions" (OPR, 2008). Until such a standard is established, OPR advises that each lead agency should develop its own approach to performing an analysis for projects that generate greenhouse gas emissions (OPR, 2008).

OPR sets out the following process for evaluating greenhouse gas emissions. First, agencies should determine whether greenhouse gas emissions may be generated by a proposed project, and if so, quantify or estimate the emissions by type or source. Calculation, modeling or estimation of greenhouse gas emissions should include the emissions associated with vehicular traffic, energy consumption, water usage and construction activities (OPR, 2008).

Agencies should then assess whether the emissions are "cumulatively considerable" even though a project's greenhouse gas emissions may be individually limited. OPR states: "Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment" (OPR, 2008). Individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice (OPR, 2008).

Finally, if the lead agency determines emissions are a cumulatively considerable contribution to a significant cumulative impact, the lead agency must investigate and implement ways to mitigate the emissions (OPR, 2008). OPR states: "Mitigation measures will vary with the type of project being contemplated, but may include alternative project designs or locations that conserve energy and water, measures that reduce vehicle miles traveled (VMT) by fossil-fueled vehicles, measures that contribute to established regional or programmatic mitigation strategies, and measures that sequester carbon to offset the emissions from the project" (OPR, 2008). OPR concludes that "A lead agency is not responsible for wholly eliminating all GHG emissions from a project; the CEQA standard is to mitigate to a level that is "less than significant" (OPR, 2008). The technical advisory includes a list of mitigation measures that can be applied on a project-by-project basis.

Chapter 5.0 discusses the environmental effects of climate change, including potential climate change effects with respect to water supply and water resources. Chapter 5.0 also provides extensive background information on the relationship between emissions of greenhouse gases and climate change.

Local

Bay Area Air Quality Management District

The regional and county air districts are primarily responsible for developing local air quality plans and regulating stationary emissions sources and facilities. The project area lies within the jurisdiction of the BAAQMD. As noted earlier, the federal CAA and the state CCAA require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). Plans are also required under federal law for areas designated as "maintenance" for national standards. Such plans are to include strategies for attaining the standards.

Currently, there are two plans for the Bay Area: the *San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard* (BAAQMD, 2001), which was developed to meet federal ozone air quality planning requirements, and the *Bay Area 2005 Ozone Strategy* (BAAQMD, 2006a), which was developed to meet planning requirements related to the state ozone standard. These attainment plans depend on BAAQMD's permit authority, which is exercised through

BAAQMD's *Rules and Regulations.* Both federal and state ozone plans rely predominantly on stationary source control measures. In contrast to the ozone plans, the *Carbon Monoxide Maintenance Plan* relies on mobile source control measures.

With respect to the construction phase of the project, applicable BAAQMD regulations would relate to portable equipment (e.g., gasoline- or diesel-powered engines used for power generation, pumps, compressors, pile drivers, and cranes), architectural coatings, and paving materials. Equipment used during project construction would be subject to the requirements of BAAQMD Regulation 2 (Permits), Rule 1 (General Requirements) with respect to portable equipment unless exempt under Rule 2-1-105 (Exemption, Registered Statewide Portable Equipment); BAAQMD Regulation 8 (Organic Compounds), Rule 3 (Architectural Coatings) and Rule 15 (Emulsified and Liquid Asphalts).

Contra Costa County General Plan

The Conservation Element of the Contra Costa County General Plan (Contra Costa County, 2005) contains air quality goals and policies. These goals and policies include meeting Federal Air Quality Standards for all air pollutants (Goal 8-AA); reducing air pollution in order to protect human and environmental health (Goal 8-AB); and implementing mitigation measures when a proposed project could result in significant impacts to air quality (8-103) (Contra Costa County, 2005). A list of all the goals and policies related to air quality are listed in Appendix E.

Alameda County East County Area Plan – A Portion of the Alameda County General Plan

Alameda County's East County Area Plan (ECAP) also contains goals and policies relevant to the planning and management of air quality. Specifically, the policies in the ECAP include: meeting federal and state air quality standards for local air pollutants of concern (Policy 291); coordination of incorporation of air quality mitigations in the design of large projects that could generate high levels of air pollutants (Policy 299); and review for projects' potential to generate hazardous air pollutants (Policy 300) (East County Area Plan, 2000). These goals and policies are listed in Appendix E.

Regional Setting – General Climate and Meteorology

Emissions from any one project or region would not cause global climate change itself. For greenhouse gases, emissions from all sources on a global scale contribute to the cumulative climate change impact.

Other air pollutants are considered regional in nature, some are considered local, and some have characteristics that are both regional and local. Air pollutants are also characterized as "primary" and "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere (such as carbon monoxide, sulfur dioxide, lead particulates, and hydrogen sulfide). Secondary pollutants are those formed through chemical reactions in the atmosphere; these chemical reactions usually involve primary pollutants, normal constituents of the atmosphere, and other secondary pollutants. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) compounds

and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production. In regards to regional emissions, regional air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions (for example, wind speed, wind direction, and air temperature) in combination with local surface topography (for example, geographic features such as mountains and valleys), determine how air pollutant emissions affect regional air quality. Localized emissions are typically analyzed with regards to exposure of specific sensitive receptors to pollutant concentrations (i.e., CO hotspots and TAC health risk). Ambient CO concentrations, for example, are normally considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources.

The project sites lie within the San Francisco Bay Area (Bay Area) Air Basin, which encompasses a nine-county region including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin, and Napa Counties and the southern portions of Solano and Sonoma Counties. The climate of the Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. High-pressure systems are characterized by an upper layer of dry air that warms as it descends, which restricts the mobility of cooler marine-influenced air near the ground surface and results in the formation of subsidence inversions. During the winter, the Pacific high-pressure system shifts southward, thereby allowing storms to pass through the region. During summer and fall, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone.

The eastern portions of Contra Costa County are generally well ventilated by winds flowing through the Carquinez Straits and Delta. Terrain does not restrict ventilation, but temperatures are quite warm, which promotes the formation of ozone (BAAQMD, 1999).

Existing Air Quality

The Los Vaqueros Reservoir Expansion Project components would be located primarily in eastern Contra Costa County, although a portion of the Transfer-Bethany Pipeline would be located in Alameda County. The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of the six criteria pollutants (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter [(PM10 and PM2.5)], and lead). Existing air quality in the Bay Area can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its monitoring stations. The major pollutants of concern in the Bay Area—ozone, particulate matter, and carbon monoxide—are monitored at a number of locations. The monitoring station closest to the project area is on Rincon Avenue in Livermore, approximately eight miles from Los Vaqueros Reservoir. **Table 4.10-4** shows a five-

TABLE 4.10-4
AIR QUALITY DATA SUMMARY (2002–2006) FOR THE PROJECT AREA

Pollutant	Standard[a]	Monitoring Data by Year				
		2002	2003	2004	2005	2006
Ozone: Rincon Avenue, Livermore						
Highest 1-Hour Average (ppm)[b]	0.09	**0.160**	**0.128**	**0.113**	**0.120**	**0.127**
Days over State Standard		10	10	5	6	13
Highest 8-Hour Average (ppm)[b]	0.08	**0.106**	**0.094**	0.080	**0.090**	**0.101**
Days over National Standard		6	3	0	1	5
Carbon Monoxide: Rincon Avenue, Livermore						
Highest 8-Hour Average (ppm)[b]	9	2.50	1.94	1.81	1.79	1.53
Days over State Standard		0	0	0	0	0
Days over National Standard		0	0	0	0	0
Particulate Matter (PM10): Rincon Avenue, Livermore						
Highest 24-Hour Average ($\mu g/m^3$)[b] – State Measurement	50	**65.9**	32.7	48.8	49.4	**69.2**
Est. Days over State Standard[c]		12.3	0	0	0	17.3
Highest 24-Hour Average ($\mu g/m^3$)[b] – National Measurement	150	63.5	31.5	46.7	48.3	67.8
Est. Days over Nat. Standard[c]		0	0	0	0	0
State Annual Average ($\mu g/m^3$)[b]	20	**25.0**	18.9	20.0	18.8	**21.8**
Particulate Matter (PM2.5): Rincon Avenue, Livermore						
Highest 24-Hour Average ($\mu g/m^3$)[b]	35	61.6	42.0	40.8	32.1	50.8
Days over National Standard[d]		0	0	0	0	0
National Annual Average ($\mu g/m^3$)[b]	12	**13.8**	9.0	10.2	9.0	9.8

[a] Generally, state standards and national standards are not to be exceeded more than once per year.
[b] ppm = parts per million; µg/m3 = micrograms per cubic meter.
[c] PM10 is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.
[d] U.S EPA lowered the 24-hour PM2.5 standard from 65 µg/m3 to 35 µg/m3 in 2006. The CARB website compares monitoring data for these years to the previous PM2.5 standard of 65 µg/m3.

NOTES: Values in bold are in excess of at least one applicable standard. NA = Not Available.

SOURCE: CARB, 2007d.

year summary of ozone, carbon monoxide, and particulate matter monitoring data from the Rincon Avenue air quality station. The table also compares measured pollutant concentrations with state and federal ambient air quality standards.

Air Pollutants of Concern

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone

concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone. On-road motor vehicles are the single largest source of ozone precursors in the Bay Area (BAAQMD, 1999).

Once formed, ozone remains in the atmosphere for one or two days. Ozone is then eliminated through chemical reaction with plants (reacts with chemicals on the leaves of plants), rainout (attaches to water droplets as they fall to earth), and washout (absorbed by water molecules in clouds and later falls to earth with rain). The Bay Area is designated as a nonattainment area for ozone, based on both national and state standards.

Carbon Monoxide

Carbon monoxide, a colorless and odorless gas, is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicles. When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Table 4.10-4 shows that exceedances of ambient carbon monoxide standards have not occurred in the Rincon Avenue station area in the last five years. CO measurements and modeling were important in the early 1980's when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, less emissions from new vehicles and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the California Air Resources Board *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas*, shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (CARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Particulate Matter

PM10 and PM2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and that can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, grading and construction, and motor vehicle use. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as

vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM10 and PM2.5, are a health concern particularly at levels above the federal and state ambient air quality standards. PM2.5 (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of PM2.5 because their immune and respiratory systems are still developing.

In the Bay Area, most particulate matter is emitted by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles. Motor vehicles constitute the single largest source of PM10 in the Bay Area (BAAQMD, 1999).

Greenhouse Gases

Gases that trap heat in the atmosphere are called greenhouse gases. Increases in greenhouse gases are causing global climate change. Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is disagreement as to the speed of global warming and the extent of the impacts attributable to human activities, most agree that there is a link between increased emission of greenhouse gases and long-term global temperature. What greenhouse gases have in common is that they allow sunlight to enter the atmosphere, but they also trap a portion of the outward-bound infrared radiation and warm up the air. The process is similar to the effect greenhouses have in raising their internal temperature, hence the name greenhouse gases. Both natural processes and human activities emit greenhouse gases.

The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of greenhouse gases in the atmosphere. This accumulation of greenhouse gases has contributed to an increase in the temperature of the earth's atmosphere and contributed to global climate change. The principal greenhouse gases are carbon dioxide (CO_2), methane, nitrous oxide (N_2O), sulfur hexafluoride, perfluorocarbons, hydrofluorocarbons, and water vapor. Carbon dioxide is the reference gas for climate change. To account for the warming potential of greenhouse gases, and to combine emissions of gases with differing properties, greenhouse gas emissions are often quantified and reported as CO_2 equivalents (CO_2E).

The World Meteorological Organization (WMO) reported that since the start of the twentieth century, the global average surface temperature has risen between 0.6 degrees Celsius (°C) and 0.7°C (1.08 degrees Fahrenheit (°F) and 1.26°F). But this rise has not been continuous. Since 1976, global average temperature has risen sharply, at 0.18°C (0.32°F) per decade. In the

northern and southern hemispheres, the 1990s were the warmest decade, with an average of 0.38°C (0.68°F) and 0.23°C (0.41°F) above the 30-year mean, respectively (WMO, 2005). The 10 warmest years for the earth's surface temperature all occurred after 1990 and the first or second warmest year on record appears to have occurred in 2005. Recent research suggests that warming occurring during the last four decades could be attributable to the increasing atmospheric concentrations of climate change emissions due to human activities (Cayan et al. 2006).

In California and throughout western North America, observations reveal trends in the past 50 years toward warmer winter and spring temperatures, a smaller fraction of precipitation falling as snow instead of rain (Knowles et al. 2006), a decrease in the amount of spring snow accumulation in lower and middle elevation mountain zones (Mote et al. 2005), and an advance in snowmelt of 5 to 30 days earlier in the spring (Stewart et al. 2005).

Climate variability and change would interact with other environmental stresses and socioeconomic changes. Chapter 5.0 discusses climate change effects with respect to water supply and water resources. Air and water pollution and management, habitat fragmentation, wetland loss, coastal erosion, and reduction in fisheries are likely to be compounded by climate-related stresses. An aging populace nationally, and rapidly growing populations in cities, coastal areas, and across the South and West are social factors that interact with and alter sensitivity to climate variability and change (NAST, 2000a). Water resources in the west are particularly susceptible to the impacts of climate change, especially for the West, Pacific Northwest, and Alaska. Reduced summer runoff, increased winter runoff, and increased demands are likely to compound current stresses on water supplies and flood management in the West (NAST, 2000b). Potential impacts are of special concern to regions like California (Kiparsky and Gleick 2003).

A GHG inventory is an accounting of the amount of GHG emitted to or removed from the atmosphere over a specified period of time attributed to activities by a particular entity (e.g., annual emissions and reductions attributed to the State of California). In 2004, total worldwide GHG emissions were estimated to be 20,135 Teragrams[3] (Tg) CO_2E.[4] In 2006, GHG emissions in the U.S. were 7,054.2 Tg CO_2E, a 14.7 percent increase over 1990 emissions.[5] California is the second largest contributor of GHG emissions in the U.S. and the sixteenth largest in the world (CEC, 2006). In 2004, California produced 497 Tg CO_2E, which is approximately 7 percent of 2004 U.S. emissions and 2.4 percent of global emissions (CEC, 2006).

Toxic Air Contaminants

Non-criteria air pollutants, or toxic air contaminants (TACs), are airborne substances capable of causing short-term (acute) or long-term, chronic or carcinogenic (i.e., cancer-causing) illnesses. TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources, including gasoline stations, automobiles, diesel engines, dry cleaners, industrial

3 1 teragram = 1 million metric tons

4 Intergovernmental Panel on Climate Change, 2007. R.B. Alley et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers.

5 U.S. Environmental Protection Agency (EPA). 2008. The U.S. Greenhouse Gas Emissions and Sinks: Fast Facts. Office of Atmospheric Programs.

operations, and painting operations. The issue of diesel particulate as a TAC is discussed above, under Regulatory Setting, State Regulations.

Sensitive Receptors

Some receptors are considered more sensitive than others to criteria air pollutants and hazardous air pollutants/toxic air contaminants. The reasons for greater than average sensitivity include preexisting health problems, proximity to the emission source, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also sensitive to poor air quality because people usually live in one place for extended periods of time.

There are no schools, hospitals, or convalescent homes near the proposed project facility sites. There are two residential communities near the project area: the Town of Discovery Bay and the Town of Byron. No project construction would occur in either of these communities, although project pipeline construction would occur in the roadway adjacent to Discovery Bay. Inside the project area, there is primarily low density, rural residential development. Following, for each alternative, is a list that summarizes the location and approximate number of residences near each proposed project area or facility site.

Alternative 1

Residential uses occur near the proposed facilities as follows:

- *Los Vaqueros Watershed* – reservoir expansion area, in-watershed facilities construction sites, borrow material and staging sites, and recreational facility sites – One residence off Los Vaqueros Road is about 2 miles south of the reservoir. There are also 12 residences on the ridge west of the watershed near Morgan Territory Road, about 1.6 miles from the reservoir and 3 miles from the reservoir dam site. In addition, there are several residences approximately 2.5 miles northeast of the expanded dam site, located off Silver Hills Drive near the north entrance to the watershed.
- *Delta Intake and Pump Station* – The closest sensitive land use to the existing Old River Intake and Pump Station is a house about 3,000 feet to the northwest along SR 4. The closest residence to the proposed new Delta Intake and Pump Station is a single farmhouse on the east side of Old River. Depending on the location selected for this facility it could be between 500 and 1,000 feet from this residence.
- *Delta-Transfer Pipeline* – Construction would occur along the south side of SR 4, as close as 50 feet from the town of Discovery Bay where as many as 120 residences are along the north side of SR 4 along the pipeline alignment. About 16 rural home sites lie within 50 feet of the 6.5-mile pipeline route as it passes along SR 4, Bixler Road, Kellogg Creek Road, and Hoffman Lane.
- *Transfer Facility Expansion* – The nearest residence to the Transfer Facility is along Walnut Avenue, about 1,450 feet west of the anticipated construction site.

- *Transfer-LV Pipeline* – About 5 rural residences along Camino Diablo and Walnut Avenue lie within 50 feet of the Transfer-LV Pipeline alignment.

- *Transfer-Bethany Pipeline* – An estimated 7 rural homesteads near Vasco Road or Armstrong Road lie as close as 50 feet from the Transfer-Bethany Pipeline alignment. The Bethany Reservoir State Recreation Area, with a bikeway along the California State Aqueduct, is along the pipeline alignment (Eastside Option) near the southern terminus of the pipeline. The project construction area at Bethany Reservoir for the tie-in is not accessible to the public and is over 300 feet from a public access area.

- *Power Option 1* – There would be no physical construction activity on the transmission line from Western's existing Tracy substation to the new substation in the project area. The existing Western transmission line would feed the new substation. The nearest rural residences are about 1,275 feet away from the new substation and upgraded transmission line to be extended from the new substation east to the new Delta Intake Pump Station. For the transmission line that would extend west to the Transfer Facility Expansion, the new 21 kV transmission line would be constructed along a portion of SR 4, in the same corridor as the Delta-Transfer Pipeline. An estimated 16 rural home sites lie within 50 feet of the proposed transmission lines.

- *Power Option 2* – Like Power Option 1, Power Option 2 would make use of Western's existing transmission line that extends northwest from it's existing Tracy substation; no facility changes or new construction would occur along this existing transmission line. The existing Western transmission line that extends east to service the Old River Pump Station would be upgraded but this option does not include a new Western sunstation. About 4 rural home sites are 1,275 feet or more from the Western transmission line proposed for upgrade. A new overhead transmission line would be extended from PG&E's existing facilities in Brentwood in the corridor as the proposed Transfer-LV Pipeline. About 5 rural residences along Camino Diablo Road and Walnut Avenue lie within 50 feet of the joint transition line and pipeline alignment. The new PG&E substation required under this option would be on CCWD property with the CCWD Los Vaqueros watershed. The nearest residence to this proposed substation lies within 500 feet and is off Silver Hills Drive.

- *Recreation Facilities* – The recreation facilities that would be replaced and expanded within the Los Vaqueros Watershed would be near and around the reservoir. The closest homes to the reservoir include 12 residences on the ridge west of the watershed near Morgan Territory Road, about 1.6 miles from the reservoir and 3 miles from the Marina Complex site. A single residence off Los Vaqueros Road to the south is located about 2 miles from the reservoir and 4.8 miles from the proposed Marina Complex. In addition, there are several residences approximately 2.5 miles northeast of the expanded dam site, located off Silver Hills Drive near the north entrance to the watershed.

Alternative 2

The sensitive receptors for localized air quality effects associated with Alternative 2 would be the same as those described above for Alternative 1 because Alternative 2 includes all the same proposed facilities and construction activities in the same locations.

Alternative 3

Sensitive receptors for Alternative 3 would be largely the same as those outlined for Alternative 1 with three substantive differences:

- The existing Old River Intake and Pump Station would be expanded under this alternative but not under Alternative 1. Construction activity to expand this facility would occur approximately 3,000 feet from the nearest residence located to the northwest along State Route (SR) 4 (see Figure 4.11-3).

- Alternative 3 would not include construction of a new Delta Intake so there would be no exposure of sensitive receptors to air pollutant emissions associated with this facility, as there would be under Alternative 1.

- Alternative 3 would not include the Transfer-Bethany pipeline, so there would be no exposure of sensitive receptors to air pollutant emissions associated with this facility.

The closest sensitive receptors to the remaining project components would be the same as described above for Alternative 1.

Alternative 4

Alternative 4 would include a dam raise for a 160 TAF reservoir that would be smaller and involve less construction material and construction activity than the dam raise required under Alternative 1 for the 275 TAF reservoir. Under Alternative 4, the closest sensitive receptors to the Expanded Los Vaqueros Reservoir Expansion/Dam Modification site include twelve residences on the ridge west of the watershed located near Morgan Territory Road, located approximately 1.6 miles from the Reservoir and 3 miles from the Marina Complex site. The closest sensitive receptor to the 160 TAF Reservoir Expansion borrow area is a residence located on the southeast corner of Camino Diablo and Walnut Boulevard, over 4,000 feet north of the 160 TAF borrow site.

Alternative 4 would not include expansion of the existing Old River Pump Station or construction of the new Delta Intake and Pump Station, any of the proposed conveyance facilities, or any new power supply facilities. Also, fewer recreation facilities would be relocated or expanded within CCWD watershed lands under Alternative 4 than under Alternative 1.

4.10.2 Environmental Consequences

Methodology

Project-related air quality impacts would fall into two categories: short-term, construction-related impacts and long-term, operations-related impacts. Short-term construction activities would primarily result in the generation of ROG, NOx, PM10 and GHGs from construction equipment. Long-term operational emission sources would result in nominal emissions associated with vehicle trips during routine inspection and maintenance of the project components and infrequent testing of emergency generators. In addition, the independent power plants and facilities that generate the electricity necessary to operate the expanded Los Vaqueros system facilities would emit pollutants, including GHGs.

For the evaluation of construction impacts associated with emissions of criteria pollutants, the BAAQMD does not require a detailed quantification of construction emissions. Instead, it recommends that evaluation of the significance of impacts be based on a consideration of the control

measures to be implemented (BAAQMD, 1999). The BAAQMD CEQA Guidelines recognize that construction equipment emits ozone precursors, but indicate that such emissions are included in the emission inventory that is the basis for regional air quality plans. The guidelines note that during construction, PM10 is the pollutant of greatest concern and can potentially lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces. Generally, if appropriate measures are implemented to reduce fugitive dust, then the residual impact can be presumed to be less-than-significant. Without these measures, the impact is generally considered to be significant, particularly if sensitive land uses (e.g., residential) are located in the project vicinity.

Because the proposed project and alternatives would be subject to the General Conformity Rule, construction emissions associated with the proposed project and alternatives were calculated. U.S. EPA's *de minimis* conformity thresholds also were used to determine the significance of criteria pollutants emitted during construction. As recommended by the BAAQMD, construction emissions (including CO_2) were calculated using the CARB OFFROAD2007 model for off-road equipment and the EMFAC2007 model for on-road workers and haul trucks (Vintze, 2005).

For GHG (CO_2E) quantification, the analysis uses OFFROAD2007 for construction activity emissions and Global Warming Potential emission factors from the *California Climate Action Registry General Reporting Protocol* (California Climate Action Registry, 2008), as well as existing and projected pumping rates, associated electrical demand, and power source carbon emissions information (for PG&E or Central Valley Project (CVP)/Modesto Irrigation District (MID)) for indirect electricity generation (CCWD, 2008). The approach to the GHG emissions analysis is discussed in more detailed in Impact 4.10.5, below.

Significance Criteria

For the purpose of this analysis, the following thresholds of significance have been applied. These thresholds are based on the BAAQMD CEQA Guidelines, the State CEQA Guidelines (Appendix G), and the lead agencies' judgment as to the criterion to address the greenhouse gas emissions associated with the proposed project. The thresholds described below 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. The project could have a significant effect if it would:

- Generate substantial criteria air pollutants during construction that would contribute to existing nonattainment conditions and further degrade air quality;
- Generate substantial criteria pollutants from operations that would contribute to existing nonattainment conditions or violate applicable air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations, including concentrations of hazardous air pollutants/toxic air contaminants, during construction and/or operations;
- Create objectionable odors affecting a substantial number of people;
- Result in cumulatively considerable contributions to greenhouse gas emissions in light of state goals for reducing greenhouse gas emissions; or

- Result in cumulatively considerable criteria pollutant emissions during construction and operations.

These criteria are defined further as follows:

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. If effective and comprehensive control measures are implemented as appropriate, then short-term constructions impacts would be reduced to a less-than-significant level. These control measures would be deemed to prevent project construction-related emissions of criteria pollutants from resulting in or substantially contributing to emissions concentrations (e.g., ROG, NO_x, and PM10) that exceed the NAAQS and CAAQS.

According to 40 CFR 93.153, conformity determinations are required for federal actions that occur in nonattainment or maintenance areas and result in generation of emissions that exceed established *de minimis* levels. **Table 4.10-5** summarizes the federal emissions thresholds applicable to this project.

TABLE 4.10-5
FEDERAL GENERAL CONFORMITY
CRITERIA AIR POLLUTANT EMISSION THRESHOLDS

Pollutant	Federal Threshold (tons/year)
NOx	100
ROG	100
CO	100

SOURCE: U.S. Department of Energy, Safety and Health Office of NEPA Policy and Assurance, 2000.

A federal project that does not exceed the *de minimis* threshold rates may still be subject to a general conformity determination if the sum of direct and indirect emissions would exceed 10 percent of the emissions of the nonattainment or maintenance area. If emissions would exceed 10 percent, the federal project is considered "regionally significant," and thus general conformity rules apply. If the emissions would not exceed the *de minimis* levels and are not regionally significant, then the project is assumed to conform, and no further analysis or determination is required. These standards are applied to construction emissions associated with this project.

Long-term operational criteria air pollutant emissions: Regional impacts would be considered significant if implementation of the proposed project would result in emissions of ROG, NO_x, or PM10 that exceed the BAAQMD thresholds of 15 tons per year. Localized 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.

Hazardous Air Pollutant (HAP)/Toxic air contaminant (TAC) emissions: HAP/TAC emissions would be considered significant if incremental increases in emissions from the proposed project

would be calculated to result in the probability of contracting cancer for the Maximally Exposed Individual (MEI) that exceeds 10 in 1 million, or a Hazard Index (HI) of one.

Odors would be considered significant if proposed project implementation would result in excessive nuisance odors to any considerable number of persons or the public, as defined under the California Code of Regulations, Health & Safety Code section 41700, "Air Quality Public Nuisance."

Greenhouse gas emissions would be considered cumulatively considerable if the proposed project would conflict with the state goal of reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32, the California Global Warming Solutions Act of 2006. The lead agencies consider a conflict with the state goals identified in AB 32 to arise if a project would not comply with requirements adopted by CARB to carry out AB 32, or if a project would not incorporate features designed to reasonably minimize its GHG emissions, consistent with the policy intent of AB 32. The lead agencies have not established numeric thresholds for determining the significance of GHG emissions. Thus, this determination is qualitative, and is based upon the judgment of the lead agencies in light of the project's quantified direct and indirect emissions of GHGs, the severity of cumulative impacts from climate change, and the GHG minimization features included in the project.

Impact Summary

Table 4.10-6 provides a summary of the impact analysis for issues related to air quality based on actions outlined in Chapter 3.

Impact Analysis

No Project/No Action Alternative

Under the No Project/No Action Alternative, no facilities would be constructed. Therefore, this alternative would have no impacts associated with air quality.

Impact 4.10.1: Construction of project alternatives could generate short-term emissions of criteria air pollutants: ROG, NOx, CO, and PM10 that could contribute to existing nonattainment conditions and further degrade air quality. However, project alternatives would not exceed federal general conformity *de minimis* standards for emissions. (Less than Significant with Mitigation)

Introduction

All project alternatives would require land clearing and grubbing, earthmoving for reservoir expansion, cut and fill operations, trenching, soil compaction, and grading. Alternatives 1 through 3 would also require construction of improvements such as roadway surfaces, structures, and facilities. The emissions generated from these construction activities include:

- Dust (including PM10 and PM2.5), primarily from fugitive sources such as soil disturbance and vehicle travel over unpaved surfaces

TABLE 4.10-6
SUMMARY OF IMPACTS – AIR QUALITY

Impact	Project Alternative			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
4.10.1: Construction of project alternatives could generate short-term emissions of criteria air pollutants: ROG, NOx, CO, and PM10 that could contribute to existing nonattainment conditions and further degrade air quality. However, project alternatives would not exceed federal general conformity *de minimis* standards for emissions.	LSM	LSM	LSM	LSM
4.10.2: Operation of project alternatives would not result in emissions of criteria air pollutants at levels that would substantially contribute to a potential violation of applicable air quality standards or to nonattainment conditions.	LS	LS	LS	LS
4.10.3: Construction and/or operation of project alternatives would not expose sensitive receptors to substantial pollutant concentrations.	LS	LS	LS	LS
4.10.4: Operation of project alternatives would not create objectionable odors affecting a substantial number of people.	LS	LS	LS	LS
4.10.5: Construction and operation of project alternatives would not result in a cumulatively considerable increase in greenhouse gas emissions.	LS	LS	LS	LS
4.10.6: Construction and operation of the project alternatives could result in cumulatively considerable increases of criteria pollutant emissions.	LSM	LSM	LSM	LSM

NOTES:

SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact

- Combustion emissions of criteria air pollutants (including ROG, NOx, CO, and PM10), primarily from the operation of heavy construction machinery (primarily diesel operated), portable auxiliary equipment, and construction worker automobile and haul truck trips
- Evaporative emissions (ROG) from asphalt paving (except under Alternative 4)
- Combustion emissions of greenhouse gases, discussed in Cumulative Impact 4.10.5 below.

Construction-related fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather.

Construction activities would also result in the emission of pollutants from construction equipment exhaust and construction worker automobile and haul truck trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operating schedules, and the number of construction workers. Criteria pollutant emissions of ROG and NOx from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project construction.

Alternative 1

For the worst-case year of construction, it was assumed that construction of all components of Alternative 1 that are anticipated to occur during Year 1 of construction (including reservoir expansion, new Delta Intake and Pump Station, pipeline and electrical facilities) would occur simultaneously. Year 1 was selected because that is the year that the largest amount of construction could occur at the same time. Estimated construction-related fugitive dust emissions, as well as exhaust emissions from construction equipment and worker and haul truck trips are shown in **Table 4.10-7** for the worst-case year.

TABLE 4.10-7
ALTERNATIVE 1 ESTIMATED CONSTRUCTION EMISSIONS (TONS/YEAR) AND FEDERAL GENERAL CONFORMITY THRESHOLDS

		Year 1			
		ROG	**CO**	**NOx**	**PM10**
Reservoir Construction	Off-road Equipment[a]	5	18	37	1
	On-road Vehicles[b]	3	46	31	17
Pipeline, Delta Intake/Pump Station Construction, and Electrical Facility Construction	Off-road Equipment[a]	2	9	16	1
	Pipeline Trucks[c]	0	1	2	0
Fugitive Dust - 15 acres disturbed		0	0	0	20
Total Unmitigated Emissions (tons/year)		10	74	86	39
General Conformity Thresholds – (tons/year)		100	100	100	NA
Significant (Yes or No)?		No	No	No	No

[a] Construction emissions estimates for off-road equipment were made using CARB's OFFROAD2007 model. See Appendix H for more details.
[b] EMFAC2007 emission factors were used to calculate on-road vehicle emissions from truck and worker vehicles. Notably, this value includes worker trips for all other construction components as well as truck trips for all components except for pipeline construction. Refer to Appendix H for more details.
[c] Pipeline trucks were analyzed separately since a portion comes from Southern California and a portion come from Tracy.

NOTES: Values in **bold** are in excess of the applicable General Conformity threshold.

SOURCE: ESA, 2008.

As shown in Table 4.10-7, construction annual emissions would not exceed the Federal General Conformity *de minimis* standards. The general conformity rule also requires that emissions be assessed for regional significance to determine whether the sum of direct and indirect emissions would exceed 10 percent of the emissions of the nonattainment or maintenance area. According to the CARB 2006 Estimated Annual Emissions in the BAAQMD (CARB, 2007e), total emissions of ROG, NOx, and carbon monoxide in the Bay Area Air Basin are approximately 370 tons per day, 525 tons per day, and 1,931 tons per day, respectively. As shown in Table 4.10-7, the annual unmitigated emissions of ROG, NOx, and carbon monoxide generated by Alternative 1 construction would be 10 tons per year (or 0.04 tons per day), 86 tons per year (or 0.3 tons per day), and 74 tons per year (or 0.3 tons per day), respectively. These construction emissions would represent approximately 0.01 percent of the total emissions of ROG in the Bay Area Air Basin, 0.06 percent of the total emissions of NOx in the Bay Area Air Basin, and 0.02 percent of the total emissions

of carbon monoxide in the Bay Area Air Basin. Since the emissions associated with construction are less than 10 percent of the total emissions for ROG, NOx, or carbon monoxide, no further analysis for general conformity is required.

In summary, construction emissions for Alternative 1 are not considered significant under the general conformity rule. However, fugitive dust emissions would be considered significant without BAAQMD construction control mitigation measure implementation.

Alternative 2

The potential air quality impacts associated with Alternative 2 would be the same as those described above for Alternative 1 because Alternative 2 includes all the same proposed facilities and construction activities. In summary, construction emissions for Alternative 2 are not considered significant under the general conformity rule. However, fugitive dust emissions would be considered significant without BAAQMD construction control mitigation measure implementation.

Alternative 3

For the worst-case year during construction, it was assumed that construction of all components of Alternative 3 that are anticipated to occur during Year 1 of construction (including reservoir expansion, Old River Intake and Pump Station expansion, construction of pipelines and electrical facilities) would occur simultaneously. Alternative 3 would not include development of the new Delta Intake and Pump Station or the Transfer-Bethany pipeline. As a result, construction activity for this alternative would be less intense than that described for Alternative 1. Estimated construction-related fugitive dust emissions, as well as exhaust emissions from construction equipment and worker and haul truck trips for Alternative 3 are shown in **Table 4.10-8** for the worst-case year.

As shown in Table 4.10-8, construction annual emissions would not exceed the Federal General Conformity *de minimis* standards.

The general conformity rule also requires that emissions be assessed for regional significance to determine whether the sum of direct and indirect emissions would exceed 10 percent of the emissions of the nonattainment or maintenance area. According to the CARB 2006 Estimated Annual Emissions in the BAAQMD (CARB, 2007e), total emissions of ROG, NOx, and carbon monoxide in the Bay Area Air Basin are approximately 370 tons per day, 525 tons per day, and 1,931 tons per day, respectively. As shown in Table 4.10-8, the annual unmitigated emissions of ROG, NOx, and carbon monoxide generated by Alternative 3 construction would be 10 tons per year (or 0.04 tons per day), 84 tons per year (or 0.3 tons per day), and 73 tons per year (or 0.3 tons per day), respectively. These construction emissions would represent approximately 0.01 percent of the total emissions of ROG in the Bay Area Air Basin, 0.06 percent of the total emissions of NOx in the Bay Area Air Basin, and 0.02 percent of the total emissions of carbon monoxide in the Bay Area Air Basin. Since the emissions associated with alternative construction are less than 10 percent of the total emissions for ROG, NOx, or carbon monoxide, no further analysis for general conformity is required.

TABLE 4.10-8
ALTERNATIVE 3 ESTIMATED CONSTRUCTION EMISSIONS (TONS/YEAR) AND FEDERAL GENERAL CONFORMITY THRESHOLDS

		Year 1			
		ROG	**CO**	**NOx**	**PM10**
Reservoir Construction	Off-road Equipment[a]	5	18	37	1
	On-road Vehicles[b]	3	46	31	17
Pipeline, Old River Intake/Pump Station Expansion, and Electrical Facility Construction	Off-road Equipment[a]	2	8	14	1
	Pipeline Trucks[c]	0	1	2	0
Fugitive Dust - 15 acres disturbed		0	0	0	20
Total Unmitigated Emissions (tons/year)		10	73	84	39
General Conformity Thresholds – (tons/year)		100	100	100	NA
Significant (Yes or No)?		No	No	No	No

[a] Construction emissions estimates for off-road equipment were made using CARB's OFFROAD2007 model. See Appendix H for more details.
[b] EMFAC2007 emission factors were used to calculate on-road vehicle emissions from truck and worker vehicles. Notably, this value includes worker trips for all other construction components as well as truck trips for all components except for pipeline construction. Refer to Appendix H for more details.
[c] Pipeline trucks were analyzed separately since a portion come from Southern California and a portion come from Tracy.

NOTES: Values in **bold** are in excess of the applicable General Conformity threshold.

SOURCE: ESA, 2008.

In summary, construction emissions for Alternative 3 are not considered significant under the general conformity rule. However, fugitive dust emissions would be considered significant without BAAQMD construction control mitigation measure implementation.

Alternative 4

Alternative 4 is the smallest reservoir expansion considered, and has fewer new or expanded facilities than Alternatives 1, 2, and 3. Under Alternative 4, additional intake capacity is not required. The existing pipeline from the Old River Pump Station to the Transfer Facility and up to the reservoir would be used as is, with no capacity expansion required. The pumps at the existing Transfer Facility would be upgraded but all work would be done within the existing structure. No new conveyance pipeline connecting to the SBA system would be constructed. No new power facilities would be required under this alternative.

For the worst-case year of construction, it was assumed that the reservoir expansion construction activities would be the same as those under Alternative 1, 2, and 3. As explained above, no construction of intake, conveyance or electrical facilities would occur. Estimated construction-related fugitive dust emissions, as well as exhaust emissions from construction equipment and worker and haul truck trips for Alternative 4 are shown in **Table 4.10-9** for the worst-case year.

As shown in Table 4.10-9, construction annual emissions would not exceed the Federal General Conformity *de minimis* standards.

TABLE 4.10-9
ALTERNATIVE 4 ESTIMATED CONSTRUCTION EMISSIONS (TONS/YEAR) AND FEDERAL GENERAL CONFORMITY THRESHOLDS

		Year 1			
		ROG	**CO**	**NOx**	**PM10**
Reservoir Construction	Off-road Equipment[a]	5	18	37	1
	On-road Vehicles[b]	3	46	31	17
Fugitive Dust - 10 acres disturbed		0	0	0	13
Total Unmitigated Emissions (tons/year)		8	64	68	31
General Conformity Thresholds – (tons/year)		100	100	100	NA
Significant (Yes or No)?		No	No	No	No

[a] Construction emissions estimates for off-road equipment were made using CARB's OFFROAD2007 model. See Appendix H for more details.
[b] EMFAC2007 emission factors were used to calculate on-road vehicle emissions from truck and worker vehicles. Refer to Appendix H for more details.

NOTES: Values in **bold** are in excess of the applicable General Conformity threshold.

SOURCE: ESA, 2008.

The general conformity rule also requires that emissions be assessed for regional significance to determine whether the sum of direct and indirect emissions would exceed 10 percent of the emissions of the nonattainment or maintenance area. According to the CARB 2006 Estimated Annual Emissions in the BAAQMD (CARB, 2007e), total emissions of ROG, NOx, and carbon monoxide in the Bay Area Air Basin are approximately 370 tons per day, 525 tons per day, and 1,931 tons per day, respectively. As shown in Table 4.10-9, the annual unmitigated emissions of ROG, NOx, and carbon monoxide generated by Alternative 4 construction would be 8 tons per year (or 0.03 tons per day), 68 tons per year (or 0.3 tons per day), and 64 tons per year (or 0.3 tons per day), respectively. These construction emissions would represent approximately 0.008 percent of the total emissions of ROG in the Bay Area Air Basin, 0.06 percent of the total emissions of NOx in the Bay Area Air Basin, and 0.02 percent of the total emissions of carbon monoxide in the Bay Area Air Basin. Since the emissions associated with alternative construction are less than 10 percent of the total emissions for ROG, NOx, or carbon monoxide, no further analysis for general conformity is required.

In summary, construction emissions for Alternative 4 are not considered significant under the general conformity rule. However, fugitive dust emissions would be considered significant without BAAQMD construction control mitigation measure implementation.

Mitigation Measures

Measure 4.10.1: During construction, CCWD will require the construction contractor to implement the measures that are specified under BAAQMD's basic and enhanced dust control procedures. These include:

- Basic Control Measures – CCWD and its contractors will implement the following controls at all construction sites:
  - 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 two feet of freeboard.
  - Pave, apply water three times daily, or apply (nontoxic) 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 area at construction sites.
  - Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Enhanced Control Measures – CCWD and its contractors will implement the following measures during project construction for project facility sites of 4 acres or greater:
  - Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for one month or more).
  - Enclose, cover, water twice daily, or apply (nontoxic) soil stabilizers to exposed stockpiles (such as dirt and sand).
  - Limit traffic speeds on unpaved roads to 15 miles per hour.
  - Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
  - Replant vegetation in disturbed areas as quickly as possible.
- CCWD and its contractors will implement the following additional control measure during reservoir expansion construction due to the large area of disturbance:
  - Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site onto public roads.

Impact Significance after Mitigation: Less than Significant.

Impact 4.10.2: Operation of the project alternatives would not result in emissions of criteria air pollutants at levels that would substantially contribute to a potential violation of applicable air quality standards or to nonattainment conditions. (Less than Significant)

All Alternatives

None of the alternatives would include facility operations that would directly emit criteria air pollutants. However, two other sources of emissions are associated with operation of project facilities. Use of motor vehicles to travel to and from project facilities would generate mobile sources of criteria pollutant emissions, and generation of electricity to serve the project would result in emissions outside of the project area. These are described below.

Mobile Sources. Operation of project facilities under each of the alternatives is anticipated to generate traffic volumes similar to the existing traffic volumes since operation of the expanded system would require fewer than 10 new employees. There would be a very small increase in maintenance worker trips to and from expanded or new facilities, but this increase would be less than a combined total of one round trip per week. Visitor and employee trips associated with use of the recreation facilities at the expanded reservoir are also expected to be similar to current conditions. Therefore, the addition of traffic from project operations would result in a negligible increase in regional emissions of criteria air pollutants.

Electricity. Each of the alternatives would result in additional electricity consumption (approximately 54,300 megawatt-hours per year for Alternative 1, 61,200 megawatt-hours per year for Alternative 2, 22,900 megawatt-hours per year for Alternative 3, and 2,400 megawatt-hours per year for Alternative 4) associated with pumping operations. However, because (1) emissions from electrical generating facilities would generally be located outside the Bay Area Air Basin; (2) the facilities would be equipped with Best Available Control Technology (BACT) and would be permitted as stationary sources; and (3) the emissions would be offset by the use of pollution credits, the emission of criteria pollutants from off-site generation of electricity is excluded from the evaluation of project significance for criteria pollutants (CCWD and Reclamation, 2006). These emissions are, however, considered below under the evaluation of increases in emissions of GHGs.

In summary, the project alternatives would not result in operational emissions that would exceed BAAQMD's thresholds of significance. 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.

Mitigation: None required.

Impact 4.10.3: Construction and/or operation of the project alternatives would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

All Alternatives

Carbon Monoxide (CO) Hotspots

CO is a localized pollutant of concern. The majority of construction activities would occur in the watershed, at a substantial distance from any sensitive receptors. Although portions of pipeline construction could occur approximately 50 feet from sensitive residences, CO background concentrations (where air districts still monitor CO) and the average emissions from vehicles and equipment continue to decline. Construction activities for the proposed project would not emit CO in quantities that could pose health concerns.

Project operations also 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 for operation and maintenance, as discussed above in Impact 4.10.2. The BAAQMD generally does not recommend a detailed air quality analysis for projects generating less than 2,000 trips per day (BAAQMD, 1999). Thus, increases in mobile-source emissions of CO associated with project operations would not be anticipated to result in or contribute substantially to an air quality violation. The project and the alternatives would not result in significant localized concentrations of criteria pollutants.

Toxic Air Contaminants

Construction of the proposed project would result in short-term diesel exhaust emissions (DPM), which are TACs, from on-site heavy-duty equipment. Project construction would generate DPM 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 (3 years) would only constitute approximately 4 percent of the total exposure period for Alternatives 1, 2, and 3, or 3 percent of the total exposure period for Alternative 4 (2 years). In addition, the majority of project construction activity would occur in the watershed at a substantial distance from sensitive receptors. Portions of pipeline and electrical transmission line construction could occur approximately 50 feet from residences; however, these construction activities would move along the alignment on a daily basis and would not result in extended exposure of residences to DPM. While the length of construction time in front of any given property would vary, it would not be expected to be greater than two weeks at a single point along the alignment. Because the use of mobilized equipment would be temporary and there are no sensitive receptors located immediately adjacent to areas where construction would occur for prolonged periods, DPM 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. As a result, exposure of sensitive receptors to substantial toxic air emissions from the project alternatives would be less than significant.

Mitigation: None required.

Impact 4.10.4: Operation of the project alternatives would not create objectionable odors affecting a substantial number of people. (Less than Significant)

All Alternatives

Types of land uses that typically pose potential odor problems include agriculture, wastewater treatment plants, food processing and rendering facilities, chemical plants, composting facilities, landfills, waste transfer stations, and dairies. In addition, 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 project alternatives do not include any of these land use activities or similar land uses. Therefore, none of the proposed project alternatives would create objectionable odors that would affect a substantial number of people during operations. Occasionally, diesel equipment exhaust can generate objectionable odors, but these dissipate very quickly. Thus, neither construction nor the operation of the project alternatives would result in the creation of, or frequent exposure to, an objectionable odor and odor impacts would be less than significant.

Mitigation: None required.

Cumulative Impact 4.10.5: Construction and operation of the project alternatives would not result in a cumulatively considerable increase in greenhouse gas emissions. (Less than Significant)

All Alternatives

The California Energy Commission (CEC) estimated that in 2004 California produced 500 million gross metric tons (about 550 million U.S. tons) of carbon dioxide-equivalent GHG emissions.[6] The CEC found that transportation is the source of 38 percent of the State's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 23 percent and industrial sources at 13 percent (CEC, 2006).

In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for just over half of the Bay Area's 85 million tons of GHG emissions in 2002. Industrial and commercial sources were the second largest contributors of GHG emissions with about one-fourth of total emissions. Domestic sources (e.g., home water heaters, furnaces, etc.) account for about 11 percent of the Bay Area's GHG emissions, followed by power plants at 7 percent. Oil refining currently accounts for approximately 6 percent of the total Bay Area GHG emissions (BAAQMD, 2006b).

6 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

Project GHG emissions

"The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide" (OPR, 2008). State law defines GHG to also include hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. These latter GHG compounds are usually emitted in industrial processes, and therefore not applicable to the proposed project. The calculation presented below includes construction emissions in terms of CO_2[7], and annual CO_2E GHG emissions from increased energy consumption. **Appendix H** contains information used in this analysis regarding construction scenario and energy use scenario assumptions as well as the emissions calculations used in this analysis.

Construction Emissions

Project construction would result in temporary increases in GHG emissions associated with transportation of construction materials, most notably pipeline segments and dam construction materials, as well as construction equipment operation and worker transportation. Most of the materials required for construction of the dam raise modification for reservoir expansion would be obtained from on-site borrow areas within the watershed, minimizing the need for materials transport. In addition, much of the material excavated from the proposed pipeline trenches would be reused as backfill, minimizing the need to haul material offsite for reuse or disposal elsewhere. Although the project has been designed to minimize material hauling requirements, some materials would need to be imported to the project area for the dam modification and construction of the pipelines and other facilities (e.g., engineered fill and concrete). In addition, pipeline construction would require import of pipeline segments to the project area from a pipe manufacturer. Because not all pipe manufactures make large diameter pipe of the size that might be used for the project (e.g., 132 inches in diameter), for purposes of calculating materials transportation and associated GHG emission, it was assumed that pipeline segments less than 132 inches in diameter would be manufactured in Tracy, California and that pipeline segments of 132 inches in diameter would be manufactured and transported in southern California. Appendix H provides additional details about the construction scenario assumptions used in this analysis and presents the emissions calculations.

Based on the assumptions regarding materials hauling and construction equipment operation during a worst case year of construction when activity at all project sites would occur simultaneously, construction of the project alternatives would emit approximately 22,550 metric tons CO_2E for Alternatives 1 or 2, approximately 22,285 metric tons CO_2E for Alternative 3, and approximately 19,600 metric tons CO_2E for Alternative 4.

Operational Emissions

Energy Use. Operation of the expanded Los Vaqueros Reservoir system would result in indirect GHG emissions due to increased energy use. **Table 4.10-10** summarizes the GHG emissions resulting from operation of the project under each of the four project alternatives and for Future Without Project conditions. The estimated metric tons of CO_2E for each alternative includes increases

[7] Construction emissions of carbon dioxide (CO_2) were calculated based on OFFROAD2007 and EMFAC2007 emission factors. N_2O and CH_4 were not quantified for construction activities since they contribute insignificant amounts to the total GHGs during construction.

TABLE 4.10-10
INDIRECT GHG EMISSIONS FROM PROJECT ELECTRICITY USE
(METRIC TONS/YEAR)[1]

Operational Emissions	Total Metric Tons/Year CO_2E	Increase in Metric Tons/Year CO_2E[3]
Future Without Project[2]	26,000	n/a
Alternative 1	33,800	7,900
Alternative 2	34,900	9,000
Alternative 3	30,400	4,400
Alternative 4	26,400	500

1 Metric tons/year of CO_2E were calculated using the *California Climate Action Registry General Reporting Protocol* emission factors and methodology. See Appendix H for more details.

2 "Future Without Project" includes power required for pumping at Banks and Jones Pumping Plants needed to deliver water to the SBA, SCVWD via San Luis Reservoir, and power required at CCWD's pumping facilities.

3 "Increase in Metric Tons/Year" shows the increase in the total emissions for each alternative compared to the emissions for "Future Without Project"

SOURCE: ESA, 2008; California Climate Action Registry, 2008; CCWD, 2008

in energy use associated with increased water diversion and pumping through the expanded Los Vaqueros Reservoir system and decreased energy use for the state and/or federal Delta water systems associated with a commensurate reduction in water pumping (See Appendix H for more detailed information about water system pumping). As described in Chapter 4.12 (Utilities and Public Service Systems) of this document, hydroelectric energy is a chief source of the energy delivered to the existing Los Vaqueros Reservoir system now and would be in the future as well. Compared to both existing conditions and future conditions without the project, GHG emissions would increase for all alternatives as a result of increased energy use to support increased pumping through the expanded system. These increases in emissions from electricity use would be minimized by implementing the project design features discussed below.

Reservoir Expansion. There is also the potential for additional GHG emissions (CO_2 and CH_4) from the expanded reservoir. There is apparent agreement within the scientific community that reservoirs can produce carbon dioxide and methane gases as a result of inundation and decomposition of vegetation, but disagreement on exactly how much of these gases are sequestered in reservoirs versus released into the atmosphere. At present there are no established methodologies or emission factors to quantify emission reductions or increases from reservoirs in different regions (Fearnside, 2004; NAST, 2006). However, estimates have been made for the project alternatives.

Methane production in reservoirs results from decomposition of organic matter in anoxic conditions and has been identified in some reservoirs, principally in tropical regions. For the Los Vaqueros Reservoir, submerged biomass will be minimized prior to initial filling to minimize methane emissions caused by inundation. In addition, the Los Vaqueros Reservoir is managed to maintain oxygen levels and avoid anoxic conditions at all levels of the Reservoir as an important part of maintaining water quality. The expanded reservoir will also be managed to avoid anoxic conditions. Generally wind conditions in the Los Vaqueros Reservoir minimize stratification and enhance mixing in a way that oxygen is not depleted in the reservoir. When

oxygen levels deep in the reservoir fall, an oxygenation system is employed to maintain oxygen levels; this operation would be continued in the expanded reservoir. Consequently, no significant increase in methane production is anticipated under any of the project alternatives.

Carbon dioxide production from decay of organic matter in newly inundated areas can be estimated from the vegetation load in those areas. Typically, the Los Vaqueros watershed is managed to have a vegetation load of about 700 pounds per acre when grazed, and less than 2000 pounds per acre when not grazed. Assuming the inundated area is 2000 pounds per acre, and there is no sequestering of this material in the reservoir whatsoever, the maximum amount of carbon dioxide production from decomposition of the inundated area is about 1,600 tons total for Alternatives 1, 2 and 3; this would be released over several years. If 50% of the carbon is sequestered into reservoir sediments, the total amount released would be about 800 tons. Grazing to reduce the vegetation prior to inundation would reduce the 1,600 metric tons to about 600 metric tons total and less if any carbon is sequestered in reservoir sediments. The level for Alternative 4 would be less than half these levels.

Another source of carbon to the reservoir is that which arrives with the water pumped into the reservoir. Typically, source water contains an average of 4.2 mg/l total organic carbon (TOC) during the filling season. Water leaving the reservoir has typical TOC levels of about 3.2 mg/l. Some of the TOC is likely to be sequestered in reservoir sediments, either directly through sedimentation of particulate organic carbon, or indirectly through initial uptake by organisms. If all the net carbon addition to the reservoir is converted to carbon dioxide (i.e., 4.2 mg/l input less 3.2 mg/l released), then the net increase in carbon dioxide production would be at most 135 metric tons per year of CO_2E for Alternatives 1, 2 or 3; Alternative 4 would be less than 15 tons per year. If any of the net carbon addition is sequestered, these levels would be reduced by the amount sequestered.

Algae and vegetation that grows in the reservoir would increase due to increased surface area and shallow water areas. This will take up carbon dioxide from the atmosphere. Some of that carbon would be sequestered in reservoir sediments and some would decay and go back to carbon dioxide, for a likely net sequestering of a small amount of carbon per year.

Overall, the potential net production of greenhouse gases within the reservoir as a result of reservoir expansion is not significant compared to that estimated from net energy use; it is possible that the reservoir could sequester a small amount of carbon; such an amount would also likely be not significant compared to net energy use.

Project Contribution to Cumulative Climate Change Effects from Greenhouse Gas Emissions

The project's incremental increases in GHG emissions associated with construction and electricity use and reservoir expansion would contribute to regional and global increases in GHG emissions and associated climate change effects. Until a statewide threshold has been adopted, for this analysis the following three questions are considered to assess whether the project would be in conflict with the state goals for reducing GHG emissions and make a cumulatively considerable contribution to GHG emissions.

A) Does the proposed project conflict with any measures adopted by CARB for implementation of AB 32?

B) What is the level of emissions for the proposed project in relation to the estimated GHG emissions for the Bay Area, as well as to the major facilities that are required to report GHG emissions (25,000 metric tons/year CO_2E)?

C) Are the basic parameters of the proposed project inherently energy efficient?

With regard to whether the project alternative would conflict with measures adopted by CARB, Table 4.10-3 in the setting section summarizes the most recent list of the CARB early action strategies. Few of these measures are relevant to the project. The five strategies that are relevant to the project alternatives relate primarily to fuel efficient, low emission vehicles and emission reduction methods for vehicles. These measures include (1) above ground storage tanks for fuels; (2) non-agricultural diesel off-road equipment; (3) privately owned on-road diesel trucks; (4) anti-idling enforcement of heavy trucks; and (5) tire inflation program.

CCWD is already in the process of converting its vehicle fleet to fuel efficient, low emission vehicles and the District's current vehicle maintenance procedures implement the recommended tire inflation strategy to maintain fuel efficiency. CCWD personnel working on the project (e.g., engineers, inspectors) would use the District's low emission, fuel efficient fleet vehicles. CCWD would also include anti-idling requirements in contractor specifications to reduce emissions from construction equipment and haul trucks. For these reasons, the project alternatives would not conflict with any of the CARB early action strategies.

With implementation of the project alternatives GHG emissions during construction for a worse-case year would range from approximately 19,600 metric tons CO_2E (Alternative 4) to 22,550 metric tons CO_2E (Alternatives 1 and 2). These construction emissions represent approximately 0.02 to 0.03 percent, of Bay Area GHGs emitted in 2002, respectively.[8] As shown in Table 4.10-8, the increase in indirect GHG emissions from project electricity use for each alternative would be no more than 9,000 metric tons/year CO_2E. This is well under the 25,000 metric tons/year CO_2E threshold used to classify major emitters. In comparison to Bay Area GHG emissions, the project alternatives' future increases in annual operational emissions represent approximately 0.009 percent (Alternative 1), 0.01 percent (Alternative 2), 0.005 percent (Alternative 3), and 0.0006 percent (Alternative 4) of total Bay Area GHGs emitted in 2002. The 2020 GHG emissions limit for California, as adopted by CARB in December of 2007 is approximately 427 million metric tons of CO_2E. The proposed project's annual contribution would be approximately 0.002 percent (Alternative 1), 0.002 percent (Alternative 2), 0.001 percent (Alternative 3), and 0.0001 percent (Alternative 4) of this total 2020 emissions limit.

With respect to the question of energy efficiency, the project alternatives are designed to be energy efficient. The project alternatives include the following features that reduce energy use and consequently minimize GHG emissions.

8 The Bay Area Air Quality Management District reported regional Bay Area GHGs emissions in 2002 at approximately 85 million CO_2E tons. Bay Area 2002 GHG emissions are used as the baseline for determining whether a project's contributions are significant as these are the most recent emissions inventory for the bay area.

- *On-site borrow areas for dam construction materials*. Designated borrow areas have been identified with the Los Vaqueros Watershed for each alternative to supply most of the materials needed for construction of the expanded dam core and shell. This minimizes vehicle miles traveled, and associated emissions, from transportation of materials to the project site.

- *Local acquisition opportunities for construction materials to be imported*. While some construction materials will need to be imported to the project sites, most will be acquired locally from mining operations and manufacturers in northern California, including concrete supply and many of the pipeline segments. Local acquisition limits the potential materials hauling distances required for the project, which also reduces vehicle miles traveled and associated emissions.

- *Efficient (high efficiency) pumping facilities*. All new pumping facilities or pump station upgrades will make use of current, high energy efficiency equipment to minimize energy use and operational cost.

- *Renewable energy generation and energy recovery*. Renewable energy generation and energy recovery will be incorporated into the project design. Solar panels will be incorporated into the roofing of the Marina Complex and new interpretive center. Energy recovery will be implemented through hydroelectric generation incorporated into the proposed Transfer- Bethany pipeline.

- *Fuel efficient / low emission vehicles*. CCWD is already in the process of converting its vehicle fleet to increase the number of fuel-efficient, low emission vehicles. CCWD personnel will use these vehicles during project construction and operations.

CCWD continues to implement measures that reduce its GHG emissions system wide throughout its raw and treated water systems. The District is currently implementing an energy recovery project at its flow control structure #2 located at the Neroly Blending Basin, where the LV Pipeline empties into the Contra Costa Canal. In addition, CCWD has started a pilot program to convert existing treated water pump stations throughout its system to solar power. CCWD also supports wind power generation on its watershed lands, consistent with its water quality and resource management objectives for the watershed. The District has reserved additional wind rights within the watershed and leases its lands for wind power generation.

The District also continues to promote water conservation and efficiency as a way to save both water and energy, thereby reducing GHG emissions. CCWD currently saves approximately 3.3 TAF annually through its conservation program, and estimates savings of about 10 TAF annually by 2050 (CCWD, 2007). Current recycled water use within CCWD is approximately 8.6 TAF annually, and is expected to grow to approximately 13 TAF annually by 2010 (CCWD, 2005). Taken together, conservation and recycling have reduced CCWD's water deliveries from the Delta, reducing associated water pumping and related GHG emissions.

Summary

Based upon the analysis presented above, the project alternatives would not result in a cumulatively considerable increase in GHG emissions such that the project would impair the State's ability to implement AB 32.

Mitigation: None required.

Cumulative Impact 4.10.6: Construction and operation of the project alternatives could result in cumulatively considerable increases of criteria pollutant emissions. (Less than Significant with Mitigation)

All Alternatives

In regards to cumulative construction impacts, the Los Vaqueros Reservoir Expansion project requires BAAQMD dust control measures, which are intended to reduce individual project emissions. Other projects to be constructed would also be required to include similar BAAQMD control measures to reduce emissions. Thus, with mitigation, the Los Vaqueros Reservoir Expansion project would not make a cumulatively considerable contribution to short-term construction emissions.

For long-term operational effects, the BAAQMD recommends a tiered approach to significance determination where a project does not individually have a significant operational air quality impacts, as here. No cumulative impact will be found where:

1. The local general plan is consistent with the latest Clean Air Plan (CAP), which is currently the Bay Area 2005 Ozone Strategy (BAAQMD, 2006a); and

2. The project is consistent with the local general plan.

The Los Vaqueros Reservoir Expansion project does not individually have significant operational air quality impacts. In regards to condition (1), BAAQMD CEQA Guidelines specify that CAP consistency be based on: (a) population projections consistent with CAP and ABAG projections, (b) rate of increase of VMT does not exceed rate of increase in population, (c) CAP transportation control measures (TCMs) are being implemented by the applicable local governments, and (d) buffer zones are provided around sources of odors, toxics, and accidental releases. For criteria (a), as described in Chapter 4.20, the proposed project would improve water supply reliability for some water users in Alameda County, Contra Costa County, and Santa Clara County. The project is not considered to be growth inducing and therefore would not result in increased populations in these areas that would be inconsistent with adopted local land use plans or inconsistent with the BAAQMD CAP. For criteria (b), the project would result in a negligible long-term increase in VMT since there would be less than 10 new employees. The project would not result in an increase in population growth or a noticeable increase in VMT, so the rate of increase of VMT would not exceed the rate of growth of population. For criteria (c), **Table 4.10-11** identifies those TCMs that local governments should implement through local plans. The project is in the jurisdiction of Contra Costa County and Alameda County. The Contra Costa County General Plan (Contra Costa County, 2005) and the Alameda County East Area Plan (Alameda County, 2002) each incorporate policies to implement the TCMs in the Transportation Element of the respective General Plan. For criteria (d), as described in Impact 4.10.3 and Impact 4.10.4, the project would not be a source of substantial TAC emissions or odors.

TABLE 4.10-11
TCMS IN THE BAY AREA OZONE STRATEGY TO BE IMPLEMENTED BY LOCAL GOVERNMENTS

1. Support Voluntary Employer-Based Trip Reduction Programs
2. Improve Bicycle Access and Facilities
3. Improve Arterial Traffic Management
4. Local Clean Air Plans, Policies and Programs
5. Conduct Demonstration Projects
6. Pedestrian Travel
7. Promote Traffic Calming Measures

SOURCE: BAAQMD, 2006a.

For condition (2), the proposed project would not require a general plan amendment, and would therefore be consistent with the applicable general plans. Furthermore, as discussed above under Impact 4.10.2, the project would result in minimal criteria pollutant emissions during long-term operations since pumps would be electrically powered and there would be negligible VMT from the less than 10 new employees.

Based on criteria (1) and (2) described above, the proposed project would result in a less than significant cumulative impact.

Implement Mitigation Measure 4.10.1.

Impact Significance after Mitigation: Less than Significant.

4.11 Noise

This section provides an overview of the existing noise environment in the Los Vaqueros Reservoir Expansion Project area, as well as the regulatory framework, an analysis of potential noise impacts that would result from implementation of the project and alternatives, and mitigation measures where appropriate.

4.11.1 Affected Environment

Noise and Vibration Principles

Noise Descriptors

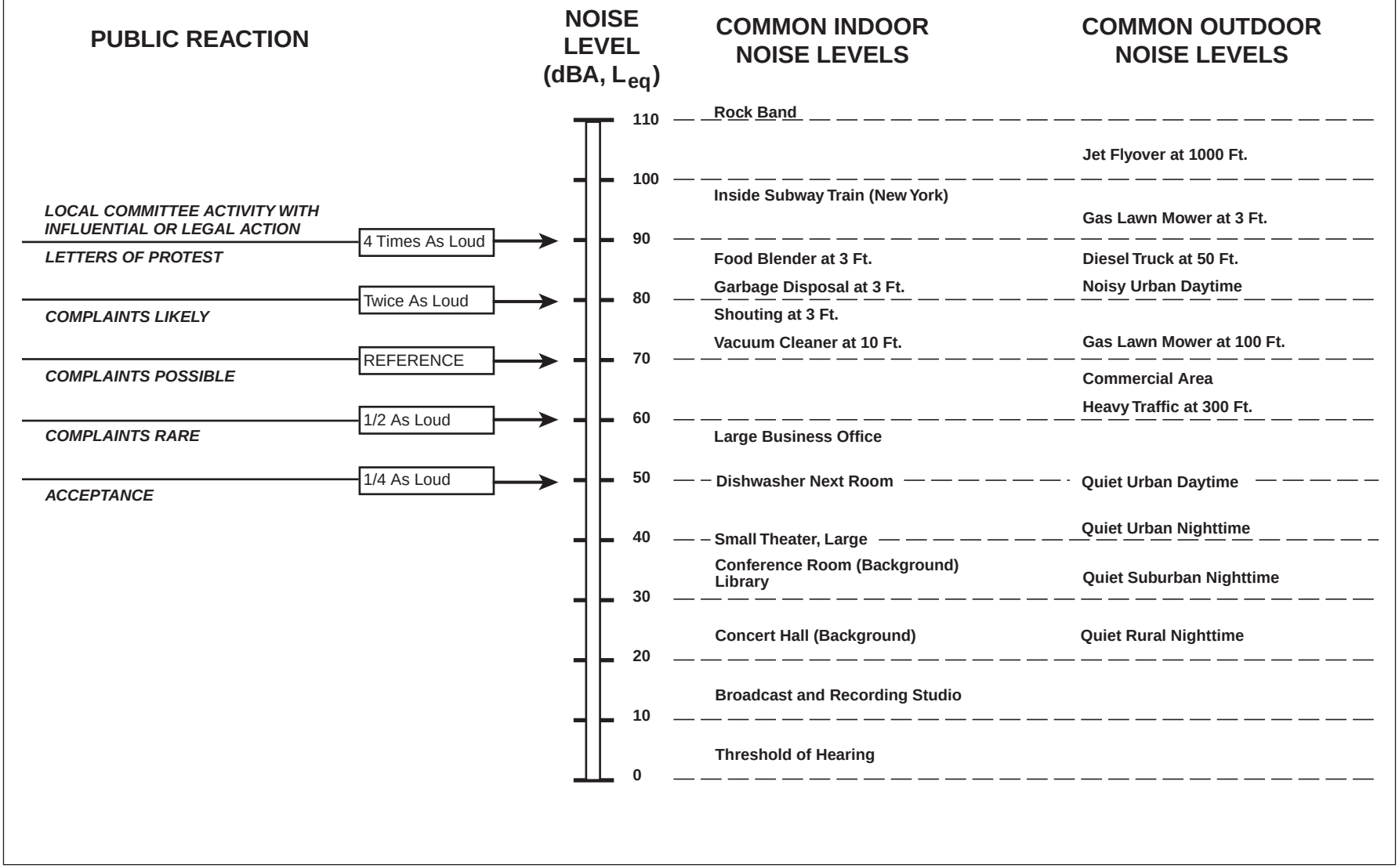
Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ears decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 4.11-1**.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure 4.11-1 are representative of measured noise at a given instant in time; however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day but does so gradually, corresponding with the addition and subtraction



SOURCE: ESA, 2008

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Figure 4.11-1

Effects of Noise on People

of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment varies the community noise level from instant to instant, thus requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

Leq: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The Leq is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

Lmax: The instantaneous maximum noise level for a specified period of time.

L50: The noise level that is equaled or exceeded 50 percent of the specified time period. The L50 represents the median sound level.

L90: The noise level that is equaled or exceeded 90 percent of the specified time period. The L90 is sometimes used to represent the background sound level.

DNL: The 24-hour day and night A-weighted noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.

CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between 10:00 p.m. and 7:00 a.m.

As a general rule, in areas where the noise environment is dominated by traffic, the Leq during the peak hour is generally equivalent to the DNL at that location (Caltrans, 1998).

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, or learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting

a human reaction to a new noise environment is the way the noise compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected.
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a nonlinear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion but increase logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver, such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites, and the changes in noise levels with distance (the drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such at traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans, 1998).

Fundamentals of Vibration

As described in the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment* (FTA, 2006), ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility; ground-borne vibration can cause buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving, and operating heavy earthmoving equipment.

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most

frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the affect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

Ground-borne vibration can cause movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Buildings are rarely damaged during construction projects, although blasting and pile-driving have on occasion caused building damage. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The Federal Transit Administration (FTA) measure of the threshold of architectural damage for conventional sensitive structures is 0.2 inch per second PPV, and the FTA threshold of human annoyance to ground-borne vibration is 80 RMS (FTA, 2006).

In regards to blasting activities, the term “blast noise” is misleading because the largest component of blast-induced noise occurs at frequencies below the threshold-of-hearing for humans (16 to 20 Hz). Hence, the common industry term for blast-induced noise is “air-overpressure”. As its name implies, air-overpressure is a measure of the transient pressure changes. These low-intensity pulsating pressure changes, above and below ambient atmospheric pressure, are manifested in the form of acoustical waves traveling through the air. When measurements include the low frequency component they are called linear scale measurements and are expressed as dBL. Air-overpressure has a 133 dBL regulatory limit used by the US Bureau of Mines for air-overpressure measured with a 2-Hz response seismograph. Research into window damage caused by overpressure has shown first failures occur at 150dBL with substantial window damage occurring at 160dBL.

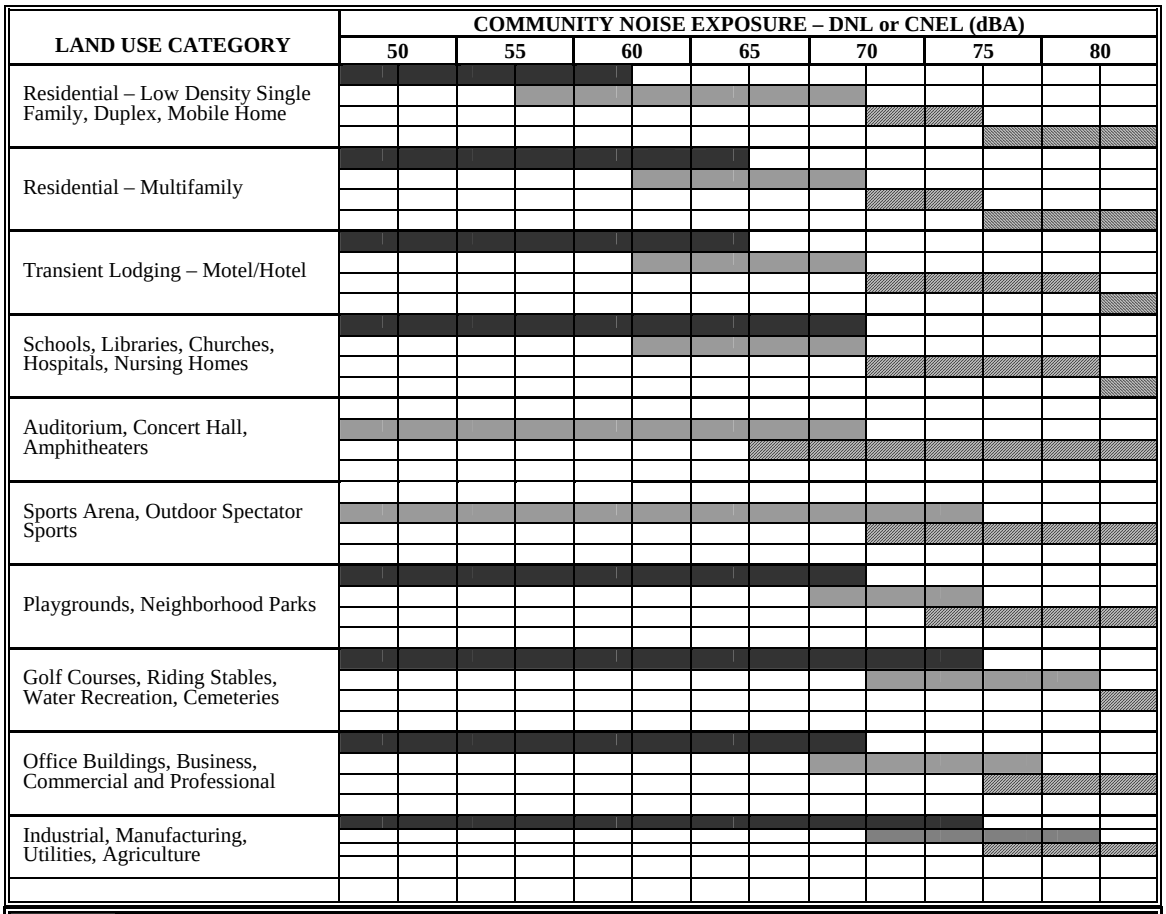
Regulatory Setting

Federal

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under the Code of Federal Regulations, Title 40, Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

State

The State of California has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as shown in **Figure 4.11-2**. The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the



	Normally Acceptable	Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: State of California, Governor's Office of Planning and Research, 1998.

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Figure 4.11-2
Land Use Compatibility for Community Noise Environment

state pass-by standard is consistent with the federal limit of 80 dB. The state pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

The State of California has also established noise insulation standards for new multifamily residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations). The noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room. Where dwelling units are proposed in areas subject to noise levels greater than DNL 60 dBA, these standards require an acoustical analysis that demonstrates how such units have been designed to meet this interior standard. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Local

In California, local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans, and noise ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. General plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are considered to be the most sensitive type of land use to noise, and industrial/commercial areas are considered to be the least sensitive.

Contra Costa County Noise Element

Contra Costa County does not have an adopted noise ordinance; however, the Noise Element of the Contra Costa County General Plan (Contra Costa County, 2005) sets various goals and policies that act as noise and land use compatibility guidance for projects in Contra Costa County. Most of these policies address land use compatibility 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, which address 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.

Policy 11-2 also notes that the County's standard for outdoor noise levels in residential areas is 60 dB DNL, but that this level "may not be achievable in all residential areas due to economic or aesthetic constraints." These and other noise related goals and policies are found in Appendix E-2,

"General Plan Goals, Policies and Programs for Contra Costa County." Noise from construction activities in Contra Costa County is considered exempt from applicable standards during daytime hours, although the County has not defined "daytime" or "normal work hours" for construction noise. Instead, the County uses project-specific conditions of approval to regulate construction noise levels for projects that require County approvals (Frazier, pers. comm., 2008).

East County Area Plan – A Portion of the Alameda County General Plan

The East County Area Plan (Alameda County, 1994, revised 2002), which is a component of the Alameda County General Plan, sets various environmental health and safety goals and objectives that apply to projects in eastern Alameda County. The following noise-related policies aim to minimize East County residents' and workers' exposure to excessive noise:

- *288*. The County shall endeavor to maintain acceptable noise levels throughout East County.
- *289*. The County shall limit or appropriately mitigate new noise-sensitive development in areas exposed to projected noise levels exceeding 60 dB based on the *California Office of Noise Control Land Use Compatibility Guidelines*.

These and other noise related policies are listed in Appendix E-1. The "Alameda County General Plan Goals, Policies and Programs" do not list standards for acceptable noise levels, as provided in the Alameda County Noise Ordinance (see below); however, they indicate that noise studies should be required as part of development review.

Alameda County Noise Ordinance

Alameda County policy prohibits unnecessary, excessive, and annoying noise and vibration in the county, as described in the Alameda County Ordinance Code, Title 6.0 (Health and Safety), Chapter 6.60 (Noise). The policy is to maintain quiet in areas that have low noise levels and to implement programs aimed at reducing noise in those areas within the county where noise levels are above acceptable limits. **Table 4.11-1** presents the County's acceptable exterior noise levels within residential and commercial areas that are affected by stationary noise sources. Construction activities, including construction-related traffic noise, are exempt from the Noise Ordinance provisions if the construction activities are limited to between 7:00 a.m. and 7:00 p.m., Monday through Friday, and between 8:00 a.m. and 5:00 p.m. on Saturday and Sunday. Ord. Code § 6.60.070E.

Existing Noise Environment

The noise environment in the project area is influenced primarily by agricultural operations and traffic on local roadways. Wind turbines located in the foothills south and southeast of the Los Vaqueros Reservoir can be heard by persons in close proximity (e.g. – within approximately 1,500 feet) to wind energy generation machinery, however the turbines are not a recognizable noise source beyond their immediate geographic area. Sound levels away from these noise sources can be quite low, depending on the amount of nearby human activity.

TABLE 4.11-1
ALAMEDA COUNTY EXTERIOR NOISE LEVEL STANDARDS

Category	Cumulative Minutes in any One-Hour Time Period	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Receiving Land Use – Single or Multifamily Residential, School, Hospital, Church, or Public Library Properties – Noise Level Standards (dBA)			
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65
Receiving Land Use – Commercial Properties – Noise Level Standards (dBA)			
1	30	65	60
2	15	70	65
3	5	75	70
4	1	80	75
5	0	85	80

SOURCE: Alameda County, 2006. Alameda County Noise Ordinance, Chapter 6.60 of the Alameda County Code. Alameda County Code last updated December 2006.

Metrosonics Model db308 sound level meters were used to obtain the ambient noise level measurements. The meters were calibrated to ensure the accuracy of the measurements. Two long-term (72-hour) noise level measurements and 12 short-term (five-minute) noise level measurements were taken in the vicinity of the project sites. The noise measurement locations are shown on **Figure 4.11-3**, and the results are presented in **Table 4.11-2**. Long-term measurement results (from locations shown on Figure 4.11-3) are also graphically depicted in **Figures 4.11-4** through **4.11-9**.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others because of the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, hotels, schools, rest homes, and hospitals are generally more sensitive to noise than commercial and industrial land uses. The closest sensitive receptors to each project component are described below and shown on Figure 4.11-3.

Alternative 1

The closest sensitive receptor to the Los Vaqueros Reservoir Expansion/Dam Modification site is a single residence located along Los Vaqueros Road about 2 miles south of the reservoir. There are also 12 residences on the ridge west of the watershed near Morgan Territory Road, about 1.6 miles from the reservoir and 3 miles from the reservoir dam site. In addition, there are several residences approximately 2.5 miles northeast of the expanded dam site, located off Silver Hills Drive near the north entrance to the watershed that may also be sensitive receptors affected by some construction noise.

PHOTOGRAPH 3. View from Vista Grande Trail looking southeast toward San Joaquin County (October 2008)

PHOTOGRAPH 4. View from Eastside Trail looking northwest toward the dam and borrow area (July 2008)

SOURCE: ESA, 2006

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Figure 4.14-3
Site Photographs

TABLE 4.11-2
EXISTING NOISE ENVIRONMENT AT PROJECT SITES

Location	Time Period	Leq (dB)	Noise Sources
Long-Term Location 1: 50 feet from corner of Newport and SR 4 - About 50 feet from Delta-Transfer Pipeline and 5,000 feet from the New Western Substation.	24-hour CNEL measurements were: Wednesday 3/28/07: 72 Thursday 3/29/07: 73 Friday 3/30/07: 73	Hourly Leq ranged from: 65 – 70	Unattended noise measurements do not specifically identify noise sources.
Long-Term Location 2: 50 feet from SR 4 and near Old River Intake and Pump Station. About 4,500 feet from the new Delta Intake and Pump Station.	24-hour CNEL measurements were: Wednesday 3/28/07: 71 Thursday 3/29/07: 70 Friday 3/30/07: 70	Hourly Leq ranged from: 62 – 69	Unattended noise measurements do not specifically identify noise sources.
Short-Term Location 1: 50 feet from the corner of Discovery Bay and SR 4 - About 50 feet from Delta-Transfer Pipeline	5 Minutes 3/27/07 11:38	67.2	• Traffic at light • Wind
Short-Term Location 2: 50 feet from corner of Newport and SR 4 - About 50 feet from Delta-Transfer Pipeline and 5,000 feet from the New Western Substation.	5 Minutes 3/27/07 11:51	69.3	• Traffic 55 mph • Wind
Short-Term Location 3: 50 feet from corner of Bixler and SR 4 - About 50 feet from Delta-Transfer Pipeline	5 Minutes 3/27/07 12:12	70.1	• Traffic at light • Wind
Short-Term Location 4: Corner of SR 4 and Byron Highway - About 3,500 feet from Delta-Transfer Pipeline	5 Minutes 3/27/07 12:27	74.2	• Traffic at light • Street Cleaner 78 dB • Westside Concrete • Wind
Short-Term Location 5: 50 feet from the corner of Camino Diablo and Vasco Road - About 50 feet from Transfer-Bethany Pipeline and 9,000 feet from the stockpile area	5 Minutes 3/27/07 14:19	66.2	• Traffic at light • Wind
Short-Term Location 6: 50 feet from Vasco Road – About 1,500 feet from Transfer-Bethany Pipeline and 23,000 feet from the Expanded Dam area	5 Minutes 3/27/07 14:36	75.1	• Traffic 65 mph • Wind
Short-Term Location 7: Nearest parking lot to Los Vaqueros Dam – About 50 feet from Transfer-LV Pipeline and 900 feet from the Expanded Dam area	5 Minutes 3/27/07 14:56	46	• Cows – 50.4 dB • Dropped pen – 58 dB • Wind
Short-Term Location 7: Nearest parking lot to Los Vaqueros Dam – About 50 feet from Transfer-LV Pipeline and 900 feet from the Expanded Dam area	5 Minutes 3/27/07 15:01	45.5	• Cows – 50.4 dB • Wind
Short-Term Location 8: 50 feet from corner of Camino Diablo and Walnut Boulevard – About 50 feet from Transfer-LV Pipeline	5 Minutes 3/27/07 15:15	53	• Traffic 55 mph • Wind

TABLE 4.11-2 (Continued)
EXISTING NOISE ENVIRONMENT AT PROJECT SITES

Location	Time Period	Leq (dB)	Noise Sources
Short-Term Location 9: Near LT2. 50 feet from SR 4 and near Old River Intake and Pump Station. About 4,500 feet from the new Delta Intake and Pump Station.	5 Minutes 3/27/07 16:05	69.6	• Traffic 45 mph • Wind
Short-Term Location 10: 50 feet from Kellogg Creek Road - About 50 feet from Delta-Transfer Pipeline	5 Minutes 4/02/07 10:08	49	• Traffic on SR 4 in distance • Wind
Short-Term Location 11: 50 feet from Byron Highway and Hoffman Lane - About 50 feet from Delta-Transfer Pipeline	5 Minutes 4/02/07 10:22	63.4	• Traffic on Byron Highway • Two cars on Hoffman • Wind
Short-Term Location 12: 50 feet from Hoffman Lane - About 50 feet from Delta-Transfer Pipeline	5 Minutes 4/02/07 10:30	56.9	• Traffic on SR 4 in distance • Tractor in adjacent field • Truck 72 dB • Wind

SOURCE: ESA, 2007.

The new Delta Intake and Pump Station would be constructed along Old River within the siting zone shown on Figure 3-14, and could be as close as 500 feet or as far as 1,000 feet from an existing residence located on the east side of Old River, outside the levee. For purposes of impact assessment, this residence is considered to be located 500 feet east of the anticipated construction.

Conveyance facilities for Alternative 1 include the following facilities and associated sensitive receptors:

- The Delta-Transfer Pipeline would pass as close as 50 feet from the closest homes on SR 4, Bixler Road, Kellogg Creek Road, and Hoffman Lane, including construction along SR 4 south of the Discovery Bay residential community.
- The Transfer Facility Expansion would be about 1,450 feet east of the nearest residence on Walnut Boulevard.
- The Transfer-LV Pipeline would pass as close as 50 feet from homes on along Camino Diablo and Walnut Avenue.
- The Transfer-Bethany Pipeline would pass as close as 50 feet from homes on Armstrong Road.

Proposed additional electrical power supply lines would be extended to the existing Old River Intake and Pump Station, new Delta Intake and Pump Station, and Expanded Transfer Facility and would largely be located in close proximity to proposed project pipelines, affecting the same sensitive receptors as described above.

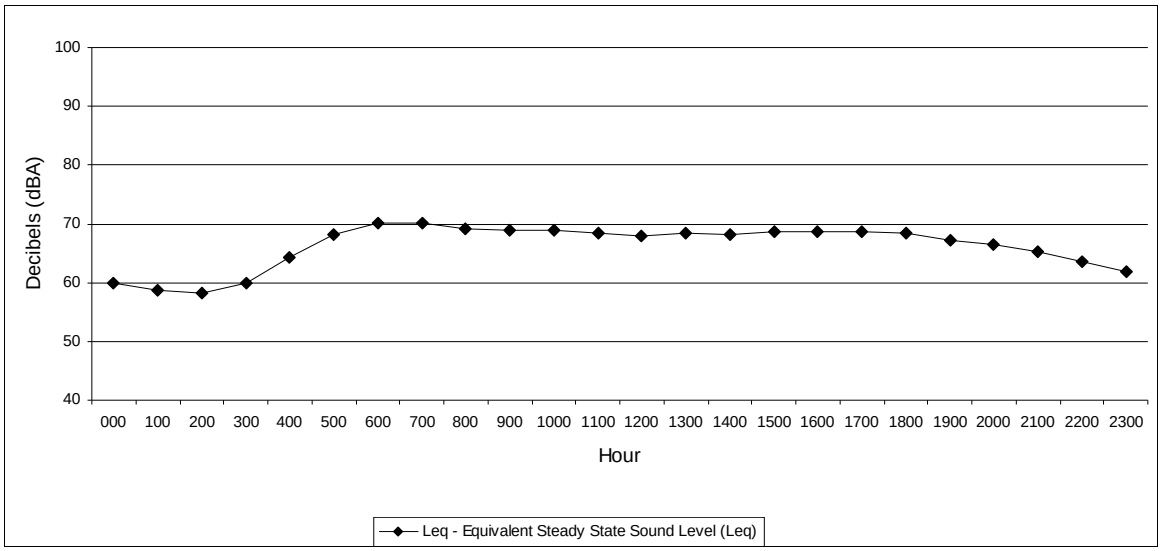

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Figure 4.11-4
24-Hour Noise Measurement – Site LT1
Wednesday March 28, 2007

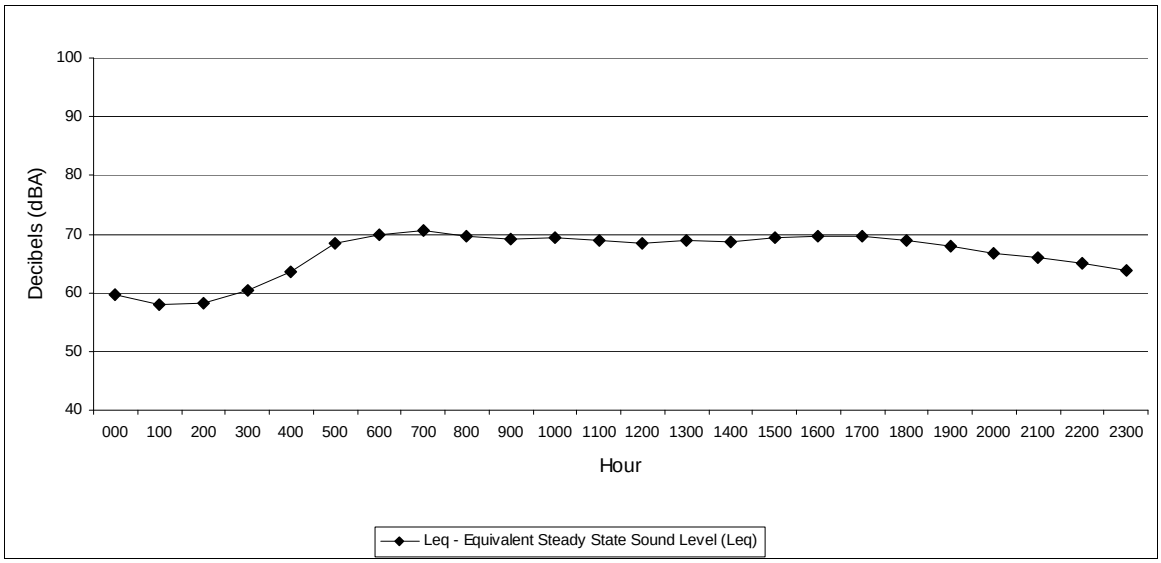

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Figure 4.11-5
24-Hour Noise Measurement – Site LT1
Thursday March 29, 2007

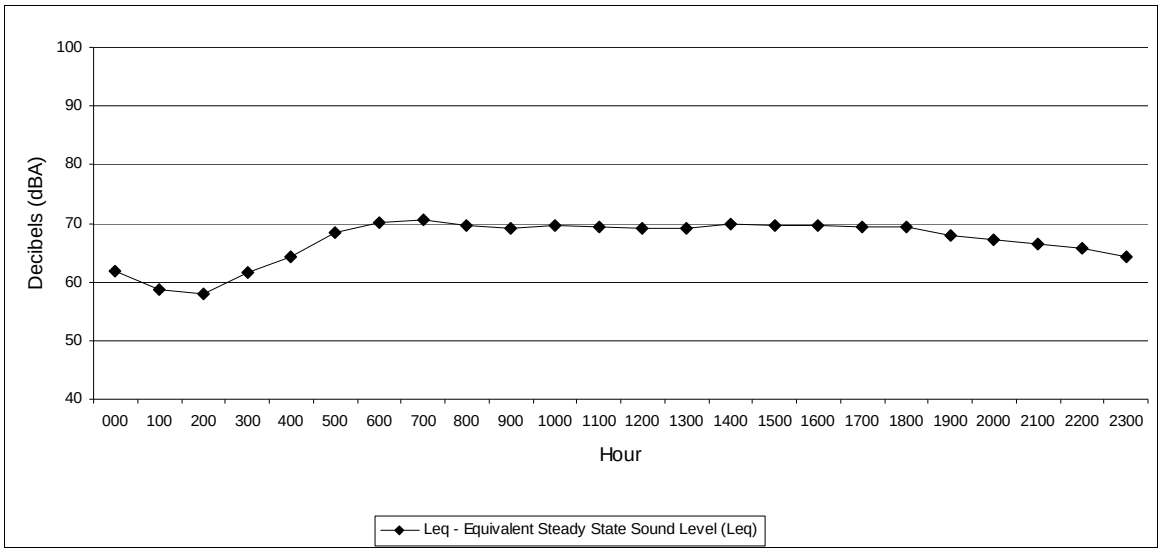

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Figure 4.11-6
24-Hour Noise Measurement – Site LT1
Friday March 30, 2007

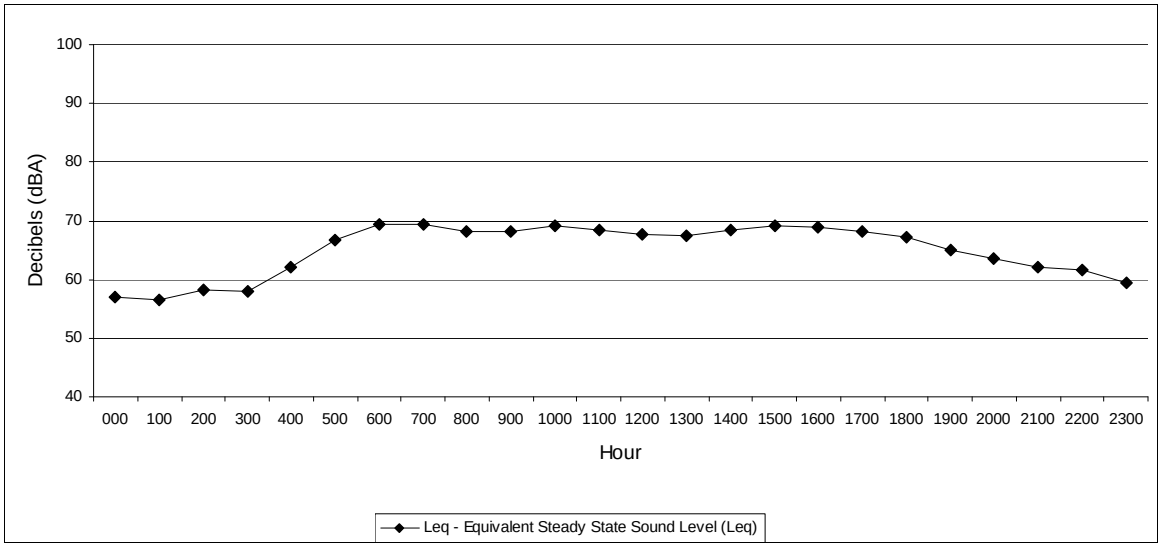

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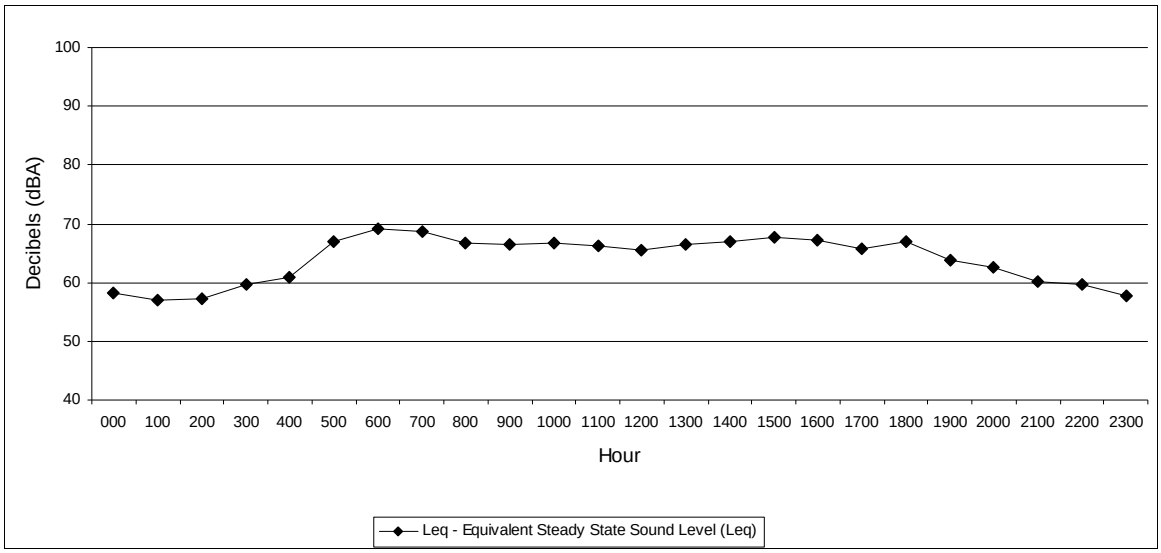
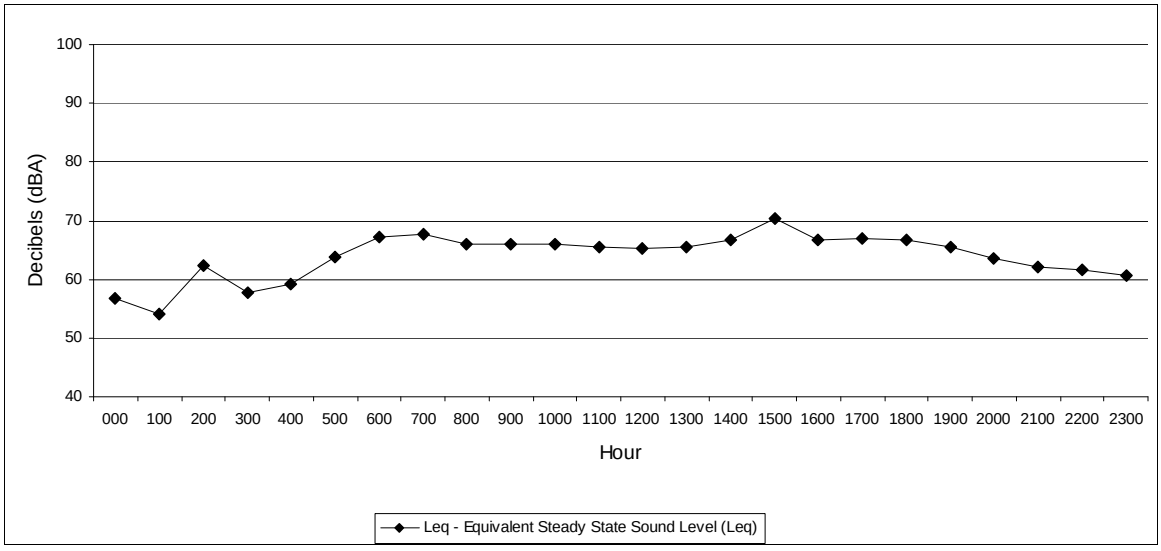
Figure 4.11-7
24-Hour Noise Measurement – Site LT2
Wednesday March 28, 2007



Los Vaqueros Reservoir Expansion Project. 201110

Figure 4.11-8
24-Hour Noise Measurement – Site LT2
Thursday March 29, 2007



Los Vaqueros Reservoir Expansion Project. 201110

Figure 4.11-9
24-Hour Noise Measurement – Site LT2
Friday March 30, 2007

The nearest rural residences to the Power Option 1 (Western only) are about 1,275 feet away from the proposed Western substation and upgraded transmission line to be extended to the new Delta Intake Pump Station. The substation under Power Option 2 (Western & PG&E) would be located within the CCWD watershed property line, approximately 500 feet west of the nearest residences located on Silver Hills Drive.

Recreation Facilities associated with expansion of the reservoir to 275 TAF include a Marina Complex and an Interpretive Center located west of the enlarged dam; relocated and new hiking trails and access; and other facilities (fishing piers, picnic areas, restrooms and parking). All of these facilities would be located within the CCWD watershed property line. The nearest sensitive receptor would be a residence located southeast of the corner of Camino Diablo and Walnut Boulevard, over one mile from anticipated new recreational facilities.

Alternative 2

The potential noise impacts on sensitive receptors associated with Alternative 2 would be exactly the same as those described above for Alternative 1 because Alternative 2 includes all the same proposed facilities and construction activities in the same locations.

Alternative 3

Sensitive receptors and noise impacts for Alternative 3 would be largely the same as those outlined for Alternative 1 with three substantive differences:

- The existing Old River Intake and Pump Station would be expanded under this alternative but not under Alternative 1. Construction activity to expand this facility would occur approximately 3,000 feet from the nearest residence located to the northwest along SR 4 (see Figure 14.11-3).

- Alternative 3 would not include construction of a new Delta Intake and Pump Station, so there would be no exposure of sensitive receptors to noise associated with this facility as there would be under Alternative 1.

- Alternative 3 would not include the Transfer-Bethany pipeline, so there would be no exposure of sensitive receptors to noise associated with this facility.

The closest sensitive receptors to the remaining project components would be the same as described above for Alternative 1.

Alternative 4

Alternative 4 would include a dam raise for a 160 TAF reservoir that would be smaller and involve less construction material and construction activity than the dam raise required under Alternative 1 for the 275 TAF reservoir. Alternative 4 would involve construction of the same dam appurtenance facilities as Alternative 1. Under Alternative 4, the closest sensitive receptor to the Expanded Los Vaqueros Reservoir Expansion/Dam Modification site is the single residence located along Los Vaqueros Road 1.5 miles to the south. In addition, there are also several residences approximately 2.5 miles northeast of the expanded dam site, located off Silver Hills Drive.

There are twelve additional residences located near Morgan Territory Road about 2.5 miles southwest of the reservoir and 3 miles from the dam raise that may also be sensitive receptors affected by some construction noise. Like Alternative 1, blasting would be used at the shell borrow area adjacent to the dam, although less material would be excavated under this alternative. Blasting would not result in a significant impact on any of the nearby residences. The closest sensitive receptors to the 160 TAF Reservoir Expansion core borrow area are residences located east of the Watershed boundary, about 2,000 feet north of the 160 TAF borrow site.

Alternative 4 would not include expansion of the existing Old River Pump Station or construction of the new Delta Intake and Pump Station, any of the proposed conveyance facilities, or any new power supply facilities. Also, fewer recreation facilities would be relocated or expanded within CCWD watershed lands under Alternative 4 than under Alternative 1. Construction of the new and relocated recreation facilities would not increase noise levels at any sensitive receptor sites.

4.11.2 Environmental Consequences

Methodology

Noise impacts are assessed based on a comparative analysis of the noise levels resulting from the alternative and the noise levels under existing conditions. Analysis of temporary construction noise effects is based on typical construction phases and equipment noise levels and attenuation of those noise levels due to distances between the construction activity and the sensitive receptors near the sources of construction noise.

Vibration from construction is evaluated for potential impacts at sensitive receptors. Typical activities evaluated for potential building damage due to construction vibration include demolition, pile driving, and drilling or excavation in close proximity to structures. The ground-borne vibration is also evaluated for perception to eliminate annoyance. Vibration propagates according to the following expression, based on point sources with normal propagation conditions:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Where PPV (equip) is the peak particle velocity in inches per second of the equipment adjusted for distance, PPV (ref) is the reference vibration level in inches per second at 25 feet, and D is the distance from the equipment to the receiver. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration and is often used in monitoring vibration because it is related to the stresses experienced by structures.

To determine the potential for annoyance, the RMS vibration level (L_v) at any distance (D) is estimated based on the following equation:

$$L_v(D) = L_v(25\ ft) - 30\log(D/25)$$

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, on thresholds used in previously certified CCWD EIRs, on the guidance provided by the Contra Costa County and Alameda County General Plans and the Alameda County Noise Ordinance, and on California Department of Transportation recommendations regarding vibration impacts. These thresholds also encompass the factors taken into account under NEPA to assess environmental impact of an action in terms of the 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. The proposed project or an alternative was determined to result in a significant effect on the noise environment as follows:

Short-Term Construction Noise Impacts. Short-term construction noise impacts from construction in Contra Costa County would be considered significant if construction activities would be conducted outside of normal working hours and if noise levels would result in noticeable noise increase (i.e., 5 dBA or greater) in ambient noise levels at nearby noise-sensitive land uses (sensitive receptors). Contra Costa County does not have noise-related performance standards or definitions of "daylight" or "normal" working hours, but for purposes of this impact analysis normal working hours are considered to be 7 a.m. to 7 p.m. Monday through Friday, and 8 a.m. to 5 p.m. on Saturday and Sunday -- the same as the exempt construction hours in Alameda County.

Similarly, for construction activities within Alameda County, in accordance with the Alameda County Noise Ordinance, short-term noise impacts from construction would also be considered significant if construction activities would be conducted outside the daytime hours of 7 a.m. to 7 p.m. Monday through Friday, or 8 a.m. to 5 p.m. on Saturday and Sunday, and if noise levels would result in noticeable noise 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 Alameda County General Plans (60 dBA L_{dn} for the most noise-sensitive land uses considered by each jurisdiction in its general plan).

Stationary and Area-Source Impacts. Long-term stationary and area source impacts would be significant if the proposed project or alternative results in an substantial permanent increase in ambient noise levels (i.e., 5 dBA) at noise-sensitive receptors (i.e., residences) as this would result in a noticeable noise increase above ambient levels, or causes the overall total noise level to exceed the "normally acceptable" standards for land use compatibility described above. In addition, for project stationary source noise in Alameda County, the associated noise levels would be considered significant if the hourly exterior Leq would exceed the standards in Table 4.11-1.

Vibration 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. Impacts would be considered significant if 0.2 inch per second PPV were reached at nearby vibration-sensitive receptors. In addition, an air-overpressure greater than 133 dBL is considered by the U.S. Bureau of Mines to be significant.

Impact Summary

Table 4.11-3 provides a summary of the impact analysis for issues related to noise based on the project construction and operation scenarios described in Chapter 3.

TABLE 4.11-3
SUMMARY OF IMPACTS – NOISE

Impact	Project Alternatives			
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
4.11.1: Construction of facilities under the proposed project and alternatives could generate noise levels that exceed the Contra Costa County or Alameda County noise standards at nearby sensitive receptors if construction activities are carried out during noise-sensitive hours, causing sleep disturbance and/or annoyance.	LSM	LSM	LSM	LSM
4.11.2: Operation of the project and alternatives would generate traffic, stationary source, and area source noise similar to existing noise associated with operation of Los Vaqueros Reservoir system and would not exceed County noise requirements.	LS	LS	LS	LS
4.11.3: Project construction would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels.	LS	LS	LS	LS
4.11.4: The proposed project or alternatives would not make a cumulatively considerable contribution to noise levels during either construction or operation.	LS	LS	LS	LS

SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact

Impact Analysis

No Project/No Action Alternative

Under the No Project/No Action Alternative, no project 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.

Impact 4.11.1: Construction of facilities under the proposed project and alternatives could generate noise levels that exceed the Contra Costa County or Alameda County noise standards at nearby sensitive receptors if construction activities are carried out during noise-sensitive hours, causing sleep disturbance and/or annoyance. (Less than Significant with Mitigation)

Neither Contra Costa County nor Alameda County applies noise standards to daytime construction noise. If project construction proceeded at night in the vicinity of sensitive receptors, however, the project could cause significant impacts by causing 5-dBA or greater increases in noise at sensitive receptors.

Construction noise levels at and near the construction areas would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips and types of vehicles used. In addition, certain types of construction equipment and construction activities generate impulsive noises (such as pile driving), which can be particularly annoying. **Table 4.11-4** shows typical noise levels during different construction stages. **Table 4.11-5** shows typical noise levels produced by various types of construction equipment.

TABLE 4.11-4
TYPICAL CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level (dBA, Leq)[a]
Ground Clearing	843
Excavation	89
Foundations	78
Erection	85
Finishing	89

[a] Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: U.S. EPA, 1971.

TABLE 4.11-5
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, Leq at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Scraper	88
Jackhammer	88
Dozer	87
Paver	89
Generator	76
Pile Driver	101
Backhoe	85
Rock Drill	98

SOURCE: Cunniff, 1977.

Blast noise occurs at a broad range of frequencies and the highest-energy blast noise usually occurs at frequencies below that of human hearing (<20 Hz). Since blasting activities generate noise at frequencies inaudible by the human ear, it will not be discussed further under this impact. The air-overpressure from blasting, however, will be analyzed under Impact 4.11.3.

Noise from construction activities generally attenuates at a rate of 4.5 to 7.5 dBA per doubling of distance; therefore, other sensitive receptors in the study area would be exposed to construction noise at incrementally lower levels than the noise levels expected at the closest residences. Noise levels are analyzed below with an assumed attenuation rate of 7.5 dBA because construction activities would attenuate at a rate similar to a point source over an absorptive ground surface.

Alternative 1

Los Vaqueros Reservoir Expansion

Expansion of Los Vaqueros Reservoir and the associated Dam Raise would require extensive excavation as well as rock drilling in preparation for blasting at the borrow area located west (upstream) of the Dam during construction. Excavation and rock drilling can generate noise levels of up to 89 dBA Leq and 98 dBA Leq at 50 feet, respectively. With the nearest residence approximately 1.5 miles (7,920 feet) west of the reservoir along Los Vaqueros Road, noise levels generated during excavation and rock drilling activities would attenuate by distance to 34 dBA Leq and 43 dBA Leq, respectively, at this residence. Construction noise at these levels would not be greater than existing noise levels in the vicinity of the reservoir (45.5 Leq measured at Short-Term Location 7, as described in Table 4.11-2).

For the residences located along Silver Hills Drive, 2.5 miles northeast of the dam, excavation and rock drilling noise attenuate by distance to less than noticeable levels (29 dBA Leq and 38 dBA Leq, respectively). For the 12 residences located along Morgan Territory Road, 3 miles west of the dam, excavation and rock drilling noise would be reduced by the distance to less than noticeable levels (27 dBA Leq and 36 dBA Leq, respectively).

Table 4.11-6 summarizes the anticipated effects of excavation and rock drilling upon sensitive receptors located 1.5 miles to 3.0 miles west of the dam raise construction.

New Delta Intake and Pump Station

During construction of the new Delta Intake and Pump Station, a residence located as close as 500 feet to the east would be exposed to approximately 66 dBA Leq sound levels during pile driving (required for installation of the cofferdam to allow construction in the river at the new intake site) based on attenuation by distance and tall earthen levees. Pile driving is among the loudest of the proposed construction activities. Existing noise levels measured at Long-Term Location 2 (62 to 69 dBA Leq, described in Table 4.11-2) would attenuate by distance to approximately 40 dBA Leq at the residence east of the New Delta Intake and Pump Station, and would be representative of ambient noise levels at this residence. Although the single residence would be buffered from some construction noise by tall earthen levees, pile driving noise at 66 dBA Leq would be substantially greater (approximately 26 dBA increase) than existing noise

TABLE 4.11-6
LOS VAQUEROS RESERVOIR EXPANSION NOISE AT THE NEAREST SENSITIVE RECEPTORS IN THE PROJECT VICINITY

Nearest Sensitive Receptor	Excavation Hourly Leq (dBA) at Receptor based on Excavation	Greater than 5 dBA increase and outside normal work hours (potentially significant)? (Yes or No)	Rock Drilling Hourly Leq (dBA) at Receptor based on Distance Alone	Greater than 5 dBA increase and outside normal work hours (potentially significant)? (Yes or No)
1.5 miles west of reservoir	34	No	43	No
2.5 miles northeast of the reservoir	29	No	38	No
3 miles west of reservoir	27	No	36	No

SOURCE: ESA, 2008.

levels at this nearby sensitive receptor location. In this same location, excavation and ground clearing noise would result in approximately 54 dBA Leq, which would also be substantially greater the ambient noise environment at this sensitive receptor.

Conveyance Facilities

Because portions of the Delta-Transfer, Transfer-LV, and Transfer-Bethany pipeline alignments are located within 50 feet of single residences as well as residential areas, some noise-sensitive receptors would be located within 50 feet of pipeline trench excavation and construction activities. Sensitive receptors, such as residences, located within 50 feet of pipeline construction areas would be exposed to 89 dBA Leq during excavation, which is anticipated to be the loudest of anticipated construction activities associated with pipeline trench construction. Construction noise at these levels would be substantially greater (approximately 40 dBA increase) than existing noise levels (49 Leq measured at Short-Term Location 10, as described in Table 4.11-2) at these nearby sensitive receptor locations.

Construction of the Transfer-Bethany Pipeline would include tunneling and trenching in the area south of the Byron Airport and toward Bethany Reservoir. Two Bethany connection options (Westside and Eastside) would both likely involve rock drilling in order to construct pipeline tunnels. The boring pit for the Westside Option tunnel is located approximately 3,000 feet south of an existing residence. Tunnel construction activities, including rock drilling, could expose this sensitive receptor to noise levels of 54 dBA Leq. Construction noise at these levels would be less than existing noise levels (75.1 dBA Leq measured at Short-Term Location 6, as described in Table 4.11-2) at these nearby sensitive receptor locations. Additional boring pits for both the Westside Option (1 additional boring pit) and Eastside Option (4 smaller boring pits) are not located in proximity to residences or other sensitive receptors.

Expansion of the Transfer Facility would include pump capacity upgrades at the existing pump station along with the construction of additional pumping facilities and a new reservoir adjacent to the existing facilities. Construction of these facilities would occur approximately 1,500 feet from the nearest residence on Walnut Boulevard, and would result in this residence being exposed to 52 dBA Leq during periods of excavation and other construction activity. Construction noise at these levels would not be greater than existing noise levels at these nearby sensitive receptor locations (53 Leq measured at Short-Term Location 8, as described in Table 4.11-2).

Power Supply

Construction of the proposed powerlines under either Power Option 1 (Western only) or Power Option 2 (Western & PG&E) would consist of vegetation removal at the pole site, auguring the pole holes, setting the framed poles, backfilling, and stringing the overhead distribution lines. In addition, pull and tension sites during conductor installation would be required. Construction of a substation under either option would include vegetation removal, grading, excavation, and construction of subsurface footings and concrete slabs for aboveground structures and equipment. Typical noise levels at 50 feet from the source for some of the heavy pieces of construction equipment that would be required to construct these electrical power facilities are listed in Table 4.11-4. Excavation would be the loudest construction activity at 89 dBA Leq at 50 feet (whereas auguring would generate 85 dBA Lmax at 50 feet (FHWA, 2006)). The nearest sensitive receptor for Power Option 1 (Western Only) is 1,275 feet away from the construction area and would be exposed to 54 dBA Leq during excavation, which would be substantially greater (5 dBA increase) than ambient noise levels (49 dBA Leq measured at Short-Term Location 10, as described in Table 4.11-2). The nearest sensitive receptor for Power Option 2 (Western & PG&E) is 500 feet away from the construction area and would result in 64 dBA Leq during excavation, which would be substantially greater (11 dBA) than ambient noise levels (53 Leq measured at Short-Term Location 8, as described in Table 4.11-2).

Under either power option, impacts from construction of the power line between the existing Western substation south of the Harvey O. Banks Pumping Plant and the Delta facilities would be somewhat less than as those analyzed for the Delta-Transfer Pipeline, above, although the facilities would be co-aligned, because the power line installation does not involve the trench excavation and trenching activities required for pipeline construction. Instead, individual power pole locations would be augured at distances of 200 to 300 feet, and lines strung between the poles.

Recreation Facilities

Recreation facilities associated with expansion of the reservoir to 275 TAF include a Marina Complex and an Interpretive Center located west of the enlarged dam; relocation of existing hiking trails and access roads; installation of additional access roads and hiking trails; and the relocation and/or addition of other facilities (i.e., fishing piers, picnic areas, restrooms and parking). All of these facilities would be located within the CCWD watershed property line. The nearest sensitive receptor would be a residence located southeast of the corner of Camino Diablo and Walnut Boulevard, over one mile from the relocated and new recreational facilities. Since pile-driving (the loudest of construction activities for the recreational facilities) construction noise for marina

development would attenuate to 50 dBA Leq, construction noise would be less than the existing noise levels (53 Leq measured at Short-Term Location 8, as described in Table 4.11-2) at this receptor and would not be noticeable.

Summary

Noise from construction of pipeline segments, the New Delta Intake and Pump Station, and power supply facilities of Alternative 1 would be significant if the construction occurred outside of the specified "normal" working hour time periods of 7 a.m. to 7 p.m. Monday through Friday, and 8 a.m. to 5 p.m. on Saturday and Sunday because these activities could result in noise increases of 5 dBA or more over ambient noise levels at sensitive noise receptors (residences) located in proximity to the construction areas.

Alternative 2

The noise generated by construction of Alternative 2 would be the same as discussed above for Alternative 1 because Alternative 2 includes construction of the same facilities as does Alternative 1. The noise impacts would be significant if the construction occurred outside of daytime hours.

Alternative 3

The noise generated by construction of Alternative 3 would be the same as discussed above for Alternative 1 with three substantive differences:

- Expansion work at the Old River Intake and Pump Station would occur approximately 3,000 feet from the nearest residence to the northwest along SR 4. This expansion work would not require pile driving, and given the distance to the nearest residence this activity would not result in construction noise levels above ambient levels, as discussed further below.

- Alternative 3 would not include a new Delta Intake and Pump Station, which would avoid pile driving and other construction approximately 500 feet from the existing residence across Old River on Victoria Island.

- Alternative 3 would not include a Transfer-Bethany pipeline, so there would be no exposure to sensitive receptor locations associated with this pipeline and its tunnel components.

During construction for the Old River Intake and Pump Station Expansion, which would occur 3,000 feet from noise-sensitive land uses to the northwest, the sensitive receptors would be exposed to 45 dBA Leq during the excavation and finish work. Construction at these sound levels would not be a significant impact on the nearest residences because the existing noise environment is dominated by traffic on SR 4, with monitored hourly Leqs that ranged from 65 to 70 dBA (Table 4.11-2, Long-Term Location 1) in the vicinity of the receptors.

Alternative 4

The noise generated by construction of Alternative 4 would be substantially less than that generated by construction of Alternative 1 because Alternative 4 would not include facilities

outside CCWD watershed property lines. Alternative 4 would include a dam raise for a 160 TAF reservoir expansion that would be smaller and involve less construction activity than the dam raise required under Alternative 1 for the 275 TAF reservoir. Alternative 4 would involve construction of the same dam appurtenance facilities as Alternative 1. Under Alternative 4, the closest sensitive receptor to the Los Vaqueros Reservoir Expansion/Dam Modification site is the single residence located along Los Vaqueros Road 1.5 miles to the south. As with Alternative 1, there are several residences about 2.5 miles northeast of the dam raise site on Silver Hills Drive, and the twelve residences located 3 miles west of the dam raise site near Morgan Territory Road. They would notice but not be adversely affected by the 160 TAF Reservoir Expansion because borrow materials would not be excavated by blasting activities at the shell borrow area adjacent to the dam, as would occur under Alternative 1. The closest sensitive receptors to the 160 TAF Reservoir Expansion core borrow area are residences located east of the Watershed boundary, about 2,000 feet to the north of the 160 TAF borrow site; excavation at the core borrow area would result in 49 dBA Leq during excavation, which would be less than ambient noise levels (53 Leq measured at Short-Term Location 8, as described in Table 4.11-2).

Alternative 4 would not include modifications to the existing Old River Pump Station or construction of the new Delta Intake and Pump Station, any of the proposed conveyance facilities, or any new power supply facilities. Also, fewer recreation facilities would be relocated or expanded within CCWD watershed lands under Alternative 4 than under Alternative 1. Construction of the new and relocated recreation facilities would not increase noise levels at any sensitive receptor sites.

Mitigation Measures

Measure 4.11.1a: To avoid noise-sensitive hours of the day and night, construction will be limited to the hours between 7 a.m. to 7 p.m. Monday through Friday, and 8 a.m. to 5 p.m. on Saturday and Sunday for the following facilities, construction activities and project areas:

- Alternatives 1, 2, 3, or 4: Construction of any facilities in those areas that are 3,000 feet or less from sensitive residences. At 3,000 feet, excavation activities would attenuate to 45 dBA and would be less than the quietest existing noise environment measured and depicted in Table 4.11-2 and would not be noticeable.

Measure 4.11.1b: To further address the impact of construction for all alternatives, construction contractors will implement the following:

- Signs will be posted at all construction site entrances to the property when project construction begins to inform all contractors/subcontractors, their employees, agents, material haulers, and all other persons at the applicable construction sites of the basic requirements of Mitigation Measures 4.11.1a, 4.11.1c, and 4.11.1d.

- Signs will be posted at the construction sites that include permitted construction days and hours, a day and evening contact number for the job site, and a contact number in the event of problems.

- An onsite complaint and enforcement manager will respond to and track complaints and questions related to noise.

Measure 4.11.1c: To reduce noise impacts due to construction for all alternatives, construction contractors will be required to implement the following measures:

- During construction, the contractor will outfit all equipment, fixed or mobile, with properly operating and maintained exhaust and intake mufflers, consistent with manufacturers' standards.

- Impact tools (e.g., jackhammers, pavement breakers, and rock drills) used for construction will be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust will be used. External jackets on the tools themselves will be used where feasible. Quieter procedures, such as use of drills rather than impact tools, will be used whenever construction occurs within 3,000 feet of sensitive residences.

- Stationary noise sources will be located as far from adjacent sensitive receptors as possible.

Measure 4.11.1d: For all alternatives, no amplified sources (e.g., stereo "boom boxes") will be used in the vicinity of residences during project construction.

Measure 4.11.1e: To further reduce less than significant pile driving noise impacts at the Delta Pump Station facilities under all alternatives, CCWD shall require construction contractors to implement "quiet" pile-driving technology (such as sonic or vibratory pile-driver use; pre-drilling of piles; jetted pile-driving) where feasible, with consideration of geotechnical and structural requirements and conditions.

Impact Significance after Mitigation: Less than Significant.

Impact 4.11.2: Operation of the project and alternatives would generate traffic, stationary source, and area source noise similar to existing noise associated with operation of the Los Vaqueros Reservoir system and would not exceed County noise requirements. (Less than Significant)

Alternative 1

Long-term operation of the proposed facilities under Alternative 1 would generate traffic volumes similar to the existing traffic within the project area. With respect to facilities operation and maintenance, there would be only a few (less than 10) additional employees added to operate the expanded system; as with the existing system most facility operations would be automated and monitored remotely. In addition, the expanded system would require only limited additional maintenance worker trips. For the most part, the new or expanded facilities would be integrated into or adjacent to existing facilities, requiring monitoring and maintenance at the same locations and at similar levels to the existing system. Facility operation would not generate much additional traffic that would contribute appreciably to noise levels in the project area. While portions of the proposed pipelines and powerlines would be located near residences, periodic inspection and maintenance of these facilities would not generate significant noise.

With respect to traffic associated with visitor use of the expanded recreation facilities at Los Vaqueros Reservoir under Alternative 1, Impact 4.9.6 in Section 4.9 – Traffic and Circulation discusses the anticipated changes in recreation traffic due to relocation of the Marina Complex from the south end of the reservoir to the north end along with the addition of an additional interpretive center and expanded hiking trails. While some increase in visitor use of the recreation facilities is anticipated under these three alternatives, the associated increase in daily traffic on local roadways would not be sufficient to appreciably affect ambient noise levels.

Noise generated the new Delta Intake and Pump Station would be similar to the noise levels at the existing Old River Intake and Pump Station. The new Delta Intake and Pump Station could be located as close as 500 feet to the nearest sensitive receptor compared to the existing Old River Intake and Pump Station, which is 3,000 feet from the nearest residence. Without proper noise control or enclosure, pump station equipment could result in noise levels in the range of 78 to 88 dBA at 3 to 5 feet from the source depending on the type and size (U.S. EPA, 1971). Existing noise levels measured at Long-Term Location 2 (62 to 69 dBA Leq, described in Table 4.11-2) would attenuate by distance to about 40 dBA Leq at the residence east of the new Delta Intake and Pump Station, and would be representative of ambient noise levels at this residence. Noise from the pump station would attenuate between the new Delta Intake and Pump Station and the nearby residence as a result of distance and the presence of earthen levees to less than 38 dBA Leq, which would be less than the ambient noise levels at this residence and would not be noticeable.

Summary

Operation of the project and alternatives would generate traffic, stationary source, and area source noise similar to existing noise associated with the current operation of Los Vaqueros Reservoir. The new Delta Intake and Pump Station would generate noise levels less than the existing ambient noise levels and would be less than significant.

Alternative 2

Operational noise effects under Alternative 2 would be exactly the same as those described for Alternative 1, since Alternative 2 includes all the same facilities and operations. As for Alternative 1, operational noise effects would be less than significant.

Alternative 3

Operational noise effects under Alternative 3 would be similar to those described for Alternative 1 although Alternative 3 would generate even less operational noise because it involves expansion of the existing Old River Intake and Pump Station instead of construction or operation of the new Delta Intake and Pump Station. Noise generated by the expanded Old River Intake and Pump Station would be similar to that of the existing facility. The noise environment for these residences would continue to be dominated by traffic noise from SR 4. Operational noise effects for Alternative 3 would be less than significant.

Alternative 4

Operational noise effects under Alternative 4 would be less than those described for Alternative 1 because this alternative involves substantially fewer new or expanded facilities. The reservoir would be expanded to 160 TAF but there would be no change in the existing intake and pumping facilities or pipeline conveyance facilities and thus no additional noise sources associated with system operations. The Marina Complex would not be relocated from the south end of the reservoir to the north end as it would under Alternative 1 and there would be no appreciable change expected in visitor use of the recreation facilities over current levels as a result of the project. Operational noise effects for Alternative 4 would be less than significant.

Mitigation: None required.

Impact 4.11.3: Project construction would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels. (Less than Significant)

Alternative 1

As shown in **Table 4.11-7**, use of heavy equipment during construction generates vibration levels of up to 0.644 PPV or 104 RMS (pile driver) at a distance of 25 feet. Bulldozers would generate approximately 0.089 PPV and 87 RMS at 25 feet. Pile driving required for construction of the new Delta Intake and Pump Station would occur within 500 to 3,000 feet of the nearest residence (depending on the final site location selected within the siting zone) and could generate vibration of approximately 0.007 PPV and 65 RMS. The nearest sensitive receptors to any of the proposed pipelines would be approximately 50 feet (for construction of the Delta-Transfer pipeline, Transfer-LV pipeline, and Transfer-Bethany pipeline, as previously described in the "Sensitive Receptor" discussion) from heavy equipment activity and could experience vibration levels of 0.031 PPV and 78 RMS from bulldozer operation. Tunneling activity associated with the Transfer-Bethany Pipeline is located 3,000 feet from the nearest sensitive receptor.

TABLE 4.11-7
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment Activity	PPV at 25 Feet (inches/second)[a]	RMS at 25 Feet (VDB)[b]
Pile Driver	0.644	104
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

[a] Buildings can be exposed to ground-borne vibration levels of 0.2 PPV without experiencing structural damage.
[b] The human annoyance response level is 80 RMS.

SOURCE: FTA, 2006.

Vibration levels at these receptors would not exceed the potential building damage threshold of 0.2 PPV or the annoyance threshold of 80 RMS. Other sensitive receptors in the project vicinity would be exposed to vibration levels at incrementally lower levels than those calculated for pile driving at the new Delta Intake and Pump Station construction site.

For potential blasting activities associated with reservoir construction (to excavate needed borrow materials), the nearest noise-sensitive residence is approximately 1.5 miles (7,920 feet) west of the reservoir. Vibration levels at this substantial distance would not be noticeable. However, in regards to air-overpressure at 1.5 miles from the blast, the nearest residence would be exposed to between 87 to 107 dBL from the blast (URS, 2008). This air-overpressure is well below the 133 dBL regulatory limit used by the U.S. Bureau of Mines. The impact associated with vibration generated by construction activities would be less-than-significant, and no mitigation is required.

Alternative 2

The vibration effects that could occur under Alternative 2 would be exactly the same as those described from Alternative 1 since this alternative would involve construction of all of the same facilities as Alternative 1. As with Alternative 1, the vibration effects of facilities construction under Alternative 2 would be less than significant.

Alternative 3

The vibration effects that could occur under Alternative 3 would be exactly the same at the expanded reservoir/dam modification site as those described from Alternative 1. Under Alternative 3 there would be no construction of a new Delta Intake and Pump Station so those vibration effects would not occur. This alternative does not include the new Transfer-Bethany pipeline and thus would not result in vibration effects caused by pipeline trenching and tunneling for this facility. As with Alternative 1, the vibration effects of facilities construction under Alternative 3 would be less than significant.

Alternative 4

The vibration effects that could occur under Alternative 4 would be much less than those described under Alternative 1 because this alternative involves construction of fewer facilities. Construction under this alternative involves only dam modification for a 160 TAF reservoir expansion and relocation of impacted recreation facilities. Earthwork and possible blasting for construction of the dam raise would result in vibration effects similar to those described for Alternative 1. As with Alternative 1, the vibration effects of facilities construction under Alternative 4 would be less than significant.

Mitigation: None required.

Impact 4.11.4: The proposed project or alternatives would not make a cumulatively considerable contribution to noise levels during either construction or operation. (Less than Significant)

All Alternatives

Noise is a localized occurrence and attenuates with distance. Therefore, only other projects or activities in relatively close proximity (about ½ mile) to the project sites would have the potential to add to anticipated project-generated noise and create cumulative noise effects. As discussed in Section 4.1 – Approach to Analysis (see subsection 4.1.3 Approach to Cumulative Analysis), there are no other identified development or public works projects proposed for construction during the same timeframe as, and in close proximity to, the proposed facility sites for the Los Vaqueros Reservoir Expansion Project. Based on this review of probable future projects, Los Vaqueros Reservoir Expansion Project construction activities would not contribute considerably to any significant cumulative noise effects. In addition, as described in Impact 4.11.1, the project construction activities that would result in the greatest noise effects would occur at pipeline construction sites in the proximity of noise-sensitive receptors (for Alternatives 1, 2 and 3). Under Mitigation Measure 4.11.1a, all pipeline construction activities within 3,000 feet of residences, would be prohibited at night. Therefore, there would be no noisy nighttime construction activities that could contribute to any significant cumulative construction noise impact, even if other projects near the Proposed Project or alternative sites are proposed and approved in the future and are constructed at night. Project construction is anticipated to be completed in approximately 3 years for Alternatives 1, 2, and 3 and less for Alternative 4, after which there would be no further potential for the project to contribute to cumulative noise effects associated with construction activities.

With respect to long-term operational noise from project traffic and stationary noise sources, again there does not appear to be the potential to make a considerable contribution to cumulative noise effects. As noted in subsection 4.1.3, Approach to Cumulative Analysis, inquiries with local land use and utility agencies in the project area did not identify any reasonably foreseeable new projects in the area in the longer term. Also, a review of the applicable local land use plans for the vicinity does not suggest the potential for appreciable development or land use changes in the vicinity of proposed project facilities. Further, as discussed in Impact 4.11.2, the project operation under all alternatives would make extremely minor contributions to the existing ambient noise levels. These contributions would be so small that they would not be cumulatively considerable. With the addition of project operations noise levels would remain similar to existing conditions, and in most project areas outside of the CCWD watershed, ambient noise levels would continue to be dominated by agricultural operations and local traffic noise. The project would not make a cumulatively considerable contribution to the noise environment.

Because, as described above, no other nearby construction projects are anticipated to coincide with project construction activities, no significant cumulative vibration impact would occur.

Mitigation: None required.

4.12 Utilities and Public Service Systems

This section describes the public services and utilities that could be affected by the Los Vaqueros Reservoir Expansion Project and identifies the entities that provide these services (e.g., cities, counties, special districts, water agencies, and power companies) in areas of unincorporated Contra Costa and Alameda Counties. Public and private utilities include local water delivery services, wastewater service, drainage service, electricity and gas, and solid waste disposal. Public services include fire protection, medical services, law enforcement, and schools. The impact analysis focuses on whether the project would result in disruptions in current service levels or necessitate the construction of additional public service or utility facilities.

4.12.1 Affected Environment

Regulatory Setting

As discussed in Section 4.1 – Approach to Analysis, local plans and policies, including those contained in city or county general plans and zoning ordinances, are reviewed in this document to provide background and context for the impact analysis, even though these plans and policies are not applicable to CCWD facilities and projects.

State and Local

California Integrated Waste Management Act (AB 939)

In 1989 the California legislature passed the Integrated Waste Management Act of 1989, known as AB 939. The bill mandates a reduction of waste being disposed: jurisdictions were required to meet diversion goals of 25% by 1995 and 50% by the year 2000 through source reduction and recycling programs. AB 939 also established an integrated framework for program implementation, solid waste planning, and solid waste facility and landfill compliance which requires each county to adopt development program for waste reduction. By Year 2000, the waste diversion rate in unincorporated portions of Contra Costa County was at 46 percent—below the mandated 50 percent reduction. As a consequence, Contra Costa County adopted Ordinance 2004-16, which requires owners of construction or demolition projects that are 5,000 square feet or greater in size to demonstrate that at least 50 percent of the construction and demolition debris generated on the jobsite is reused, recycled, or otherwise diverted (unless a diversion adjustment is granted). Contractors hauling waste to County transfer stations or landfills are typically required to demonstrate reuse, recycling and diversion of construction debris prior to loads being accepted at those facilities. Alameda County has a similar ordinance (Ordinance 2003-63), which applies only to projects on County-owned lands (Alameda County Waste Management Authority, 2003).

Contra Costa County General Plan

The Contra Costa County General Plan contains several goals and policies related to the management, planning, and maintenance of public services and utilities. Specifically, these policies include: assurance of meeting regulatory standards for water delivery, water storage, and emergency water supplies to residents (Policy 7-16); identification of necessary upgrades to fire facilities and

equipment in order to reduce fire risk and improve emergency response (Policy 7-65); and reduction of the amount of waste disposed of in landfills (Goal 7-AG) (Contra Costa County, 2005). The goals and policies presented in these plans are listed in Appendix E-2.

East County General Plan – A Portion of the Alameda County General Plan

The East County Area Plan (ECAP) area encompasses 418 square miles of eastern Alameda County and includes the cities of Dublin, Livermore, and Pleasanton, a portion of Hayward, as well as surrounding unincorporated areas. The ECAP includes goals and policies relevant to the management, planning and maintenance of public services and utilities. These goals and policies, listed in Appendix E-1, include: providing prompt and efficient police, fire, and emergency medical service needs to unincorporated areas (Policy 241); ensuring safe and efficient waste disposal (Waste Goal); providing an adequate, reliable and safe water supply (Water Goal); providing efficient and cost-effective sewer facilities and services (Sewer Goal); and facilitating the provision of gas and electric service and facilities (Policy 285) (East County Area Plan, 2002).

Environmental Setting

Utilities

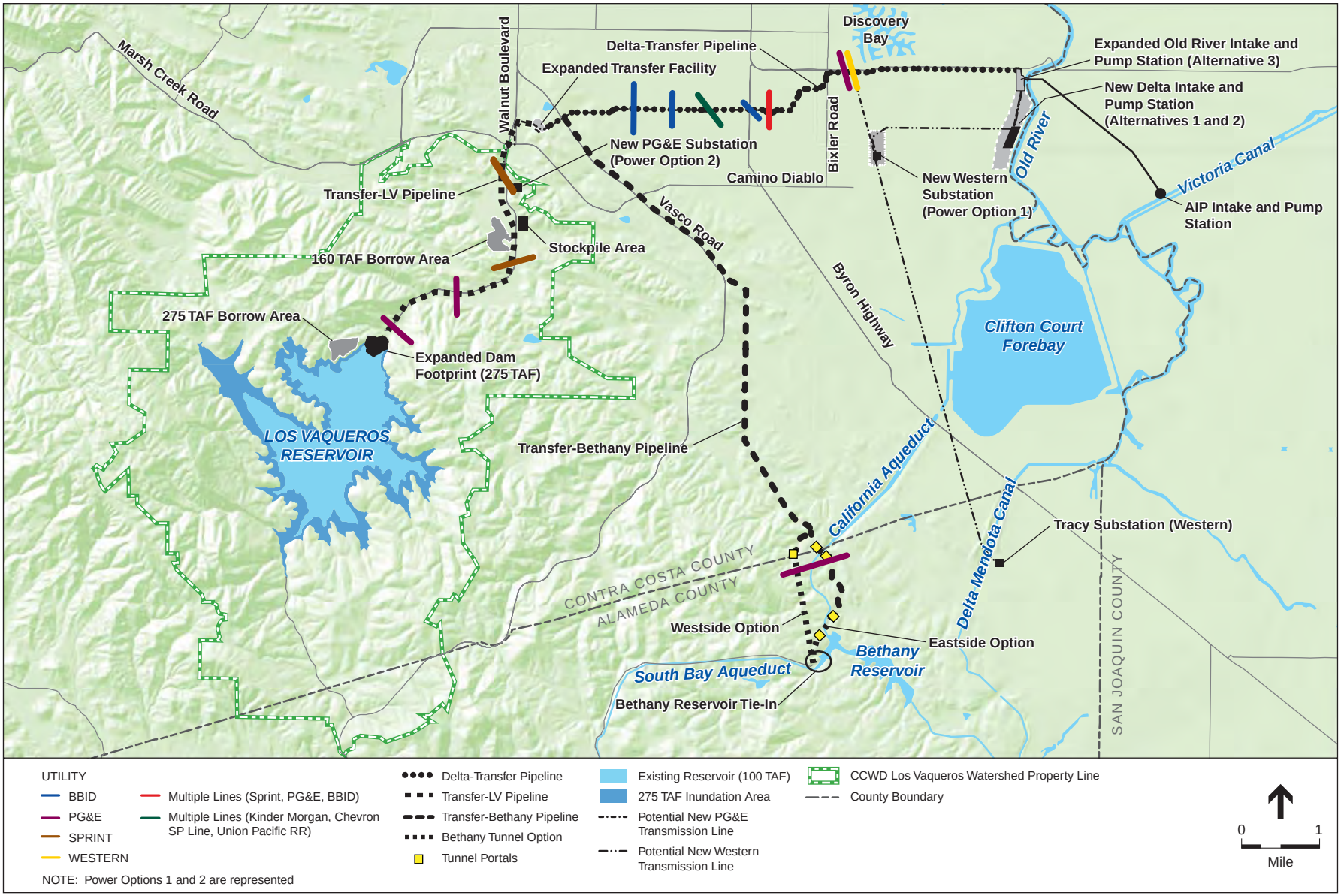
Water Service

The California Aqueduct, which is part of the State Water Project, conveys water from the Harvey O. Banks Pumping Plant to Bethany Reservoir and then south to the San Luis Reservoir and beyond.

Contra Costa Water District (CCWD) provides water service to developed areas within the project area and other portions of eastern and central Contra Costa County. CCWD supplies treated water to Clayton, Clyde, Concord, Pacheco, Port Costa, and parts of Martinez, Pleasant Hill, and Walnut Creek, and treated wholesale water service to Diablo Water District, Brentwood, and Antioch. CCWD also provides untreated water to the cities of Antioch, Pittsburg, and Martinez, Diablo Water District, Golden State Water Company, and industrial and irrigation customers.

Treated water delivery to customers within the project area is the responsibility of cities, water districts, or other public agencies, including the City of Brentwood and the Discovery Bay Community Services District. **Figure 4.12-1** schematically shows potential water pipeline and other utility crossings that could occur due to project construction throughout the project area. Rural residences located throughout the project area in southeastern Contra Costa County obtain their water from local private wells. Irrigation water in the project area is provided by Bethany-Byron Irrigation District (BBID) and the State Water Project. BBID has several canals and water delivery facilities within the area.

Potable water within the Los Vaqueros Reservoir watershed is provided by packaged membrane treatment plants located at the marina, interpretive center, and watershed offices on the north end of the watershed, and at the south-end restrooms and fish-cleaning stations.



SOURCE: USGS, 1993 (base map); and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 4.12-1

Potential Utility Crossings

Non-potable water is pumped from the reservoir for irrigation of landscaped areas and, in some locations, to operate fire hydrants. There is an existing pipeline located along the alignment of the intake and outflow pipeline that is used to access reservoir water. Landscape areas located near the Marina, Watershed Office, Interpretive Center, Kellogg Picnic Area and the dam are watered by tapping into pipeline blow off release valves. On the western side of the reservoir, water is pumped out of the reservoir to holding tanks for cattle to drink and for oak trees and other mitigation plants to be individually drip irrigated. There are also some springs available for watering trees (Mueller, 2008).

Wastewater Service

Most of the project area is undeveloped and is not served by an integrated wastewater system. Wastewater conveyance and disposal in the project area is provided by the Discovery Bay Community Services District and Byron Sanitary District. The two districts provide wastewater service for areas in the eastern Contra Costa County communities of Discovery Bay and Byron, which are generally north and east of the project area. The current method of wastewater disposal in these areas is either land disposal (land application of treated wastewater onto open space or agricultural lands) or discharge into the San Joaquin–Sacramento Delta after treatment.

In more rural locations, individual septic/leach field systems provide wastewater disposal. These individual systems are privately owned and maintained and are not connected to any larger wastewater treatment facilities.

At the Los Vaqueros Reservoir day-use areas, wastewater from the public restrooms and other facilities are regularly pumped and captured in a holding tank and hauled offsite by a contractor. The contractor that provides service to the Los Vaqueros watershed hauls the wastewater for treatment to EBMUD's wastewater treatment plant in Oakland, California (Arvizu, 2008).

Drainage / Storm Water Service

Construction and maintenance of the drainage facilities in the project area generally fall under the jurisdiction of Contra Costa County and its Flood Control and Water Conservation District. Drainage service in Alameda County is provided by Zone 7 Water Agency. As the project is almost entirely located in a rural setting, runoff throughout the project area drains primarily through natural drainage swales, ditches, and watercourses.

In Contra Costa County, the Flood Control and Water Conservation District has developed a system of flood zones (entire watersheds) and drainage basins (sub-watersheds) with adopted plans that serve both lands within cities and the unincorporated areas of the county. Some drainage areas in the County are legally "formed" with a legal boundary map, land use map, hydrology map, drainage Area plan, and a fee ordinance while others remain "unformed." The project area includes both formed and unformed drainage areas. The Kellogg Creek watershed (Basin 109) is identified as a formed drainage area (Contra Costa County, 2003). The Brushy Creek watershed (in both Contra Costa and Alameda Counties) is identified as an unformed drainage area and includes Basins 110 and 45. In urbanized areas east of the reservoir, some of these natural watercourses have been converted to underground storm drains or earthen- and/or

concrete-lined ditches, including the lower reaches of Kellogg Creek. See Section 4.5, Local Hydrology, Drainage, and Groundwater, for further discussion of drainage in the project area.

Energy Service

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas service to the project area, including the cities of Brentwood, Byron, and Discovery Bay and the unincorporated areas of Contra Costa and Alameda Counties. PG&E owns or leases 8,255 megawatts (MW) of power-generating capacity. CCWD also 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. Hydroelectric power from the CVP is delivered by the Western Area Power Administration (Western). 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.

Approximately 7,000 wind turbines are located in the areas south of Los Vaqueros Reservoir. The turbines in this area are operated by PowerWorks, EnXco, Altamont Power, Green Ridge Services, and Seawest Windfarms. There are approximately 320 active wind turbine sites located within the Los Vaqueros Reservoir watershed. The utility lines that connect the turbines to each other and to distribution facilities are buried under the dirt roads that provide access to the turbines. Proposed roads and recreational trails would use these same roads for access (Mueller, 2008).

Utility Infrastructure

Major utility infrastructure within the Los Vaqueros Reservoir watershed includes three buried natural gas pipelines; an overhead PG&E electricity transmission line; two buried PG&E gas lines; and a buried fiber-optic communications line operated by Sprint. To the northeast of the Los Vaqueros Reservoir watershed lie several irrigation lines owned by BBID, two buried petroleum pipelines owned and operated by Chevron/Unocal and Kinder Morgan, a few Sprint fiber-optic cable lines, a PG&E natural gas line, and an overhead electricity line operated by Western.

East of the Los Vaqueros Reservoir watershed lie two underground PG&E gas lines and four existing PG&E transmission lines in the project vicinity. Near the CCWD Transfer Facility is a 230 kV line operated by PG&E, which serves that facility. The line to the east between Vasco Road and Old River contains a transmission corridor with two 500 kV circuits owned and operated by PG&E and a double circuit 230 kV line owned by Western. Western is currently operating this 230 kV line at 69 kV from its Tracy Substation near the Banks Pumping Plant, and serving several loads including CCWD's existing Old River Intake and Pump Station. At present, power for the Old River Intake and Pump Station is supplied by Western and power for the Transfer Facility is supplied by PG&E through their Brentwood Substation. The project includes construction of additional energy infrastructure facilities, as described in Section 3.5.5 Power Supply Infrastructure.

Solid Waste Disposal

Two permitted, large-volume transfer/processing facilities are active in Contra Costa County. The types of materials accepted at these facilities include construction and demolition materials, green materials, agricultural waste, industrial waste, mixed municipal waste, and sludge or biosolids. Non-recyclable industrial waste generated by the project would be transported to Keller Canyon Landfill, located west of the project area on Highway 4. Keller Canyon Landfill serves the eastern and central portions of Contra Costa County and is a Class II facility with a projected life span of 40 years (Contra Costa County, 2005).

Materials recovery facility/transfer stations are used to meet the waste diversion goals mandated by AB 939. These facilities, separately or in combination, provide comprehensive materials recovery operations and efficient waste transfer operations. The station serving the eastern portions of Contra Costa County is the Contra Costa Transfer and Recovery Station (Contra Costa County, 2005).

The 2,170-acre Altamont Sanitary Landfill and the 644-acre Vasco Road Landfill, located in northeastern Alameda County, handle most of the solid waste generated in Alameda County (DWR, 2004).

The Contra Costa County Community Development Department and the Alameda County Waste Management Authority both provide an internet database that includes a list of private organizations that accept building construction or demolition materials such as bricks, concrete, wood and dirt for recycling. There are 19 organizations in the region that accept these construction materials for a fee.

Public Services

Fire Protection/Emergency Medical Services

The East Contra Costa Fire Protection District (ECCFPD) provides fire protection services to much of the project area. The Alameda County Fire Department provides fire protection in the unincorporated eastern portions of the county. Both fire departments maintain mutual-aid agreements with the East Bay Regional Park District, California Department of Forestry, and private industrial companies located within their respective jurisdictions. Both agencies are required to maintain comprehensive and efficient fire and emergency medical response services. As part of this requirement, these agencies must generally demonstrate a five-minute response time for 90 percent of all emergency calls and maintain a fire station within 1.5 miles of all residential and nonresidential developments. Stations within the immediate project area include the following:

- Station No. 57, 3024 First Street, Byron, CA 94514
- Station No. 58, 1535 Discovery Bay Boulevard, Discovery Bay, CA 94514
- Station No. 59, 1801 Bixler Road, Discovery Bay, CA 94514

The ECCFPD operates eight fire stations and contracts an additional one. The engine companies consist of three person crews including one certified Emergency Medical Technician Level 1 (Henderson, 2008). There is also a volunteer San Ramon Valley Fire Protection District Station (Station 40 - Morgan Territory) located along Morgan Territory Road. The Morgan Territory Regional Preserve adjoins CCWD watershed lands boundary to the northwest.

Law Enforcement

The Contra Costa County Sheriff's Department provides law enforcement services to the unincorporated areas of Contra Costa County. The station with responsibility for the project area is the East Contra Costa County's Oakley Delta Station. Likewise, for portions of the project that cross into Alameda County, the Alameda County Sheriff's Department provides law enforcement services. The nearest sheriff's station in Alameda County to the project area is in the San Leandro Eden Township Substation.

Although they do not serve as sworn law enforcement officers, CCWD employees routinely tour District facilities while conducting their regular duties. There is also a Marina Manager residing near the existing marina, to provide a 24-hour presence at that facility.

Schools and Recreation

No school facilities are located within 0.5 miles of any project facilities or construction sites, and therefore are not discussed further. Park and recreation facilities are discussed in Section 4.15, Recreation.

4.12.2 Environmental Consequences

Methodology

Analysis of the potential for construction activities to disrupt utilities was prepared through review of planning documents and websites, and by telephone communications with representatives of area agencies in order to identify and describe existing utilities (water, wastewater, drainage, energy, solid waste disposal) and public service (fire protection/ emergency medical services and law enforcement) facilities and systems. The identified facilities and services were then compared with proposed construction activities to assess the potential for service disruptions. Analysis of the project's potential to increase solid waste generation and meet state targets related to solid waste was conducted by identifying the excess materials that would be generated by the project, estimating the quantity of such materials that would be re-used, recycled or otherwise diverted from landfills, and assessing the potential for the project to exceed state targets for construction debris.

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 impact to utilities and public service systems if it would do any of the following:

- Disrupt utility or public services (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;
- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: fire protection, police protection, schools, or other public facilities;
- Require or result in the construction of expanded or new water or wastewater treatment facilities or stormwater drainage facilities, the construction of which could cause significant environmental effects; (part of the project description; addressed throughout EIS/EIR)
- Have insufficient water supplies available to serve the project from existing entitlements and resources, thereby necessitating new or expanded entitlements;
- Generate waste materials that would exceed the permitted capacity of local landfills, or not comply with state regulations related to solid waste;
- Require the construction of additional energy infrastructure facilities that would have significant environmental effects. (part of the project description; addressed throughout EIS/EIR)

The proposed reservoir expansion and other project components involve construction of expanded and new water facilities and infrastructure, as described in Section 3.4 Action Alternatives. Because water-related facilities form the major components of the project, each technical section and related impact discussion evaluates potential impacts associated with expansion of the reservoir, new pipelines and facility locations. Potential project impacts related to water supplies are addressed in Section 4.2, Delta Hydrology and Water Quality. Project impacts associated with drainage facilities are addressed in Section 4.5, Local Hydrology, Drainage, and Groundwater. For these reasons, no further discussion about the need for additional water treatment facilities or infrastructure, or their associated impacts, are included in this section.

The project also includes construction of additional energy infrastructure facilities, as described in Section 3.5.5 Power Supply Infrastructure. Because power supply is a component of the project, each technical section and related impact discussion evaluates Power Options 1 and 2 for impacts associated with new transmission lines and substation locations. For this reason, no further discussion about the need for additional energy infrastructure facilities and associated impacts is included in this section.

Impact Summary

Table 4.12-1 provides a summary of the impact analysis for issues related to utilities and public service systems based on actions outlined in Chapter 3.

TABLE 4.12-1
SUMMARY OF IMPACTS – UTILITIES AND PUBLIC SERVICE SYSTEMS

Impact	Project Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
4.12.1: Construction or operation of project alternatives could temporarily disrupt utilities and public service systems such that a public health hazard could be created or an extended service disruption could result.	LSM	LSM	LSM	LSM
4.12.2: Project alternatives would not require or result in construction of new or expanded utility infrastructure or public service facilities that would result in substantial adverse physical impacts.	LS	LS	LS	LS
4.12.3: Construction of the project alternatives could increase solid waste generation such that the capacity of local landfills would be exceeded or the project would not comply with state regulations related to solid waste.	LSM	LSM	LSM	LSM
4.12.4: Construction of the project alternatives could make a cumulatively considerable contribution to cumulative effects on public services and utilities, or local landfill capacity.	LSM	LSM	LSM	LSM

NOTE:

SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact

Impact Analysis

No Project/No Action Alternative

Under the No Project/No Action Alternative, no new project facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Implementation of this alternative would neither temporarily nor permanently affect the utilities and public services evaluated in this section.

Impacts 4.12.1: Construction or operation of the project alternatives could temporarily disrupt utilities and public service systems such that a public health hazard could be created or an extended service disruption could result. (Less than Significant with Mitigation)

Overview – All Alternatives

Construction of project facilities has the potential to cause short-term disruptions in utility and public services during the approximately 3-year project construction period. For utilities, construction activities have the potential to directly interrupt water, wastewater, and drainage, electrical or gas lines during installation of new pipelines, auguring for power poles or similar activities. This could include planned shut off of electrical service in a limited area and for a limited duration while crossing existing utilities lines; alternatively, disruption of utilities could

be an unintentional result of encountering unsurveyed drainage or other utility lines during pipeline trenching. Indirect effects, such as availability of potable water and wastewater services in the watershed while the reservoir area is under construction, are also addressed in this section. Extended disruption of electricity, gas or other utilities could result in public health hazards, such as loss of power during an extended heat wave.

As for public services, major construction projects such as the Los Vaqueros Reservoir expansion could result in short-term, localized access issues such as blocked driveway at residences needing fire protection, emergency medical or law enforcement services. There is also the potential to increase emergency response times for fire, emergency medical and law enforcement equipment and personnel due to increased traffic for construction material deliveries and construction workers. Section 4.9, Transportation and Circulation, addresses the potential of the proposed project to temporarily affect emergency response times and access during construction. Section 4.13 analyses impacts on emergency response/evacuation plans and wildland fire risk.

Water Supply Disruption. Under Alternatives 1, 2 and 3, the reservoir would be drained to allow for the dam modification construction, would remain empty for the three-year project construction period and would take an additional year to fill (see Section 3.5.2 Draining the Reservoir for Construction) The time needed to refill the reservoir depends on hydrologic conditions and Delta water quality during the refilling. During this period, CCWD would be able to meet its water quality goals in all but short portions of the driest years through use of the AIP facility on Victoria Canal and the intertie with EBMUD's Mokelumne Aqueduct. Under current reservoir operations, most blending for water quality is done in the fall when the quality at the Old River Intake declines. However, water quality is higher at the AIP during fall allowing water quality goals to be met with direct deliveries in most years. Additionally, under CCWD's agreement with EBMUD, 3,200 acre-feet per year of CCWD's CVP water can be diverted through the Freeport Regional Water Project facilities in the northern Delta where water quality is significantly better than at the Old River Intake. CCWD would coordinate with EBMUD to take this water when it would provide the most water quality benefit to CCWD customers. The intertie with EBMUD could also provide water in an emergency.

To further minimize the potential for water supply disruption during project construction, CCWD would provide for supplemental water supply by constructing and making operational the new Delta Intake and Pump Station (Alternatives 1 and 2) or upgrades to the Old River Intake and Pump Station (Alternative 3) early in the construction period. This additional water diversion capacity would be available in the event of an emergency or extended drought.

Under Alternative 4, a limited dam raise necessary to expand the reservoir to 160 TAF could be achieved by constructing on the downstream slope of the existing dam only, allowing the reservoir to remain in operation through the majority of construction. A drawdown of up to 60 TAF would occur during a 2-year rather than a 4-year construction period.

Also, as indicated above, CCWD would make arrangements with the East Bay Municipal Utility District (EBMUD) to secure an additional temporary supplemental supply of water during the construction period and make use of the existing CCWD-EBMUD intertie to make emergency

water deliveries into the CCWD system if needed. The intertie connects EBMUD's Mokelumne Aqueduct with CCWD's Contra Costa Canal. Like other inter-agency interties, the EBMUD-CCWD intertie was built to provide flexibility and reliability for Bay Area water users. With these provisions, water supply services would not be disrupted during the temporary project construction and reservoir re-filling period.

Alternative 1

Los Vaqueros Reservoir Expansion and Recreation Facilities

Utilities. Expansion of the Los Vaqueros Reservoir would not be expected to disrupt utilities because there are relatively few utility lines in place, and because the reservoir area would be closed to visitors during construction. During construction, potable water systems (packaged membrane treatment plants, described under Water Services) that supply water within the Los Vaqueros watershed would be dismantled in preparation for relocation to new sites. Drinking water would be delivered to the site for CCWD staff and construction workers using bottled water or other temporary systems. Non-potable water for landscape irrigation, care of oak trees and other plants and livestock ponds would be obtained by tapping water stored in pipelines on the east side of the reservoir, and through use of tanker trucks for water delivery. Existing wastewater systems would also be closed during construction, and vaults removed from areas to be inundated. Temporary portable systems (port-o-potties) would be used during construction. In summary, only temporary utility systems would be operated during construction, including construction of replacement and new recreation facilities, and there would be no customers to be disrupted within the reservoir area.

Energy. Six natural gas lines, including one near the base of the dam, traverse the existing reservoir; however, these facilities are no longer operational and are partially submerged due to construction of existing reservoir facilities. An existing PG&E electrical transmission line traverses the eastern shoreline, but would not be affected by the increased water level of the reservoir, the new dam impoundment, or the relocated recreation facilities. Therefore, these lines would not be affected by the proposed expansion.

Two active wind turbine sites located at the southeastern shore of the Los Vaqueros Reservoir would be inundated under Alternative 1. CCWD would work with the owners of the wind-generation facilities to relocate the generation capacity within the existing wind generation easement area or to compensate the owner as required under existing operating agreements.

Public Services. During the initial year for draw down, the 3-year construction period, and another year for refilling the reservoir, the watershed would be closed to visitors; only limited numbers of CCWD staff and construction workers would be allowed on CCWD property. Some CCWD staff would continue to manage watershed lands outside of construction areas; however the area gates would be locked to prevent visitors. Until construction of replacement and new recreational facilities is completed, including a new marina complex, access to watershed recreation areas would remain closed to the public. As such, there would be less need than usual for fire, emergency medical and law enforcement services and provision of public safety services

would not be disrupted. More information about maintaining emergency access during construction is provided in Section 4.9, Transportation and Circulation. More information about reducing the risk of wildfires is provided in Section 4.13 Hazardous Materials/Public Health.

New Delta Intake Facility

Utilities. No existing utilities are expected to be disrupted by construction activities associated with the new Delta Intake and Pump Station because there are no water, wastewater, drainage or energy pipelines located within the construction zone of the proposed facility. There is a 69 kV transmission line that serves the Old River Intake and Pump Station, passes through the siting zone, and that will be upgraded to serve the proposed Intake as a component of the proposed project. As such, the design, construction and coordination of these new overhead lines will be implemented in a manner to avoid power disruptions to the Old River Facility.

Public Services. As for public service issues, construction of a new intake facility would occur in an agricultural area of the county with few residents or services to be disrupted. During and after construction, the site will be fenced and gated, and access limited to CCWD staff and construction workers. No disruption of utilities or public services would result from construction of the new Delta Intake Facility.

Conveyance Facilities

Utilities. Construction of the Delta-Transfer Pipeline, expanded Transfer Facility, Transfer-LV Pipeline and Transfer-Bethany Pipeline could result in disruptions to the underground and/or overhead utilities that are shown on Figure 4.12-1. There is also the possibility during construction of disrupting un-surveyed utilities.

As shown in Figure 4.12-1, the Delta-Transfer Pipeline would cross as many as six BBID irrigation lines; two petroleum pipelines (Chevron and Kinder Morgan); a Sprint fiber-optic cable line; a Western transmission overhead line; and two PG&E 500 kV overhead transmission lines. The Delta-Transfer pipeline would also cross the Union Pacific Railroad tracks. As described in Section 3.5.2, Pipeline Construction, the bore-and-jack method would be used to pass under the railroad crossing.

The Transfer-LV Pipeline alignment would cross two PG&E natural gas pipelines and two Sprint fiber-optic cables.

The Transfer-Bethany pipeline alignment would cross one Western electric transmission line and two 36-inch PG&E natural gas lines. There are no known utility lines located in the area planned for the Westside Option pipeline tunnel. The pipeline's Eastside Option would tunnel under the California Aqueduct.

Public Services. As for public service issues, construction of a new intake facility would occur in an agricultural area of the county with few residents or services to be disrupted. More information about emergency medical services, including discussion of access during construction, is addressed in Section 4.9, Transportation and Circulation.

Power Supply

Utilities. Under both Power Options 1 and 2, addition of new transmission lines on existing, replacement, or new power poles would occur in existing utility easements. As such, auguring for power poles and other construction activities has some potential to disrupt existing utilities, which are the same utilities as in Delta-Transfer and Transfer-LV Pipelines. There is also a slight potential to impact existing or abandoned septic systems; however, this is not likely due to the relatively few houses along the power supply alignment. As for disruptions of utilities during construction of either a Western Substation under Power Option 1 or a PG&E substation under Power Option 2, this is not likely because there are no known underground utilities in potential substation siting zones.

Public Services. Construction of new power supply facilities would occur in rural areas of the Contra Costa County with relatively few residents or services to be disrupted. Furthermore, construction of new electrical lines involves placing power poles and stretching lines in a manner that would not limit access to nearby properties. Both of the two substation siting zones are in areas with limited access and limited services to be interrupted.

Summary

In summary, there is a relatively low potential for any one project component to disrupt existing utility lines or public services; however, when considered in the context of multiple project components under concurrent construction for an approximately 3-year period, the potential for disruption is increased considerably. There is also the possibility during construction of disrupting un-surveyed utilities. For this reason, Under Alternative 1 there is the potential for short-term disruption of utilities and public services; related impacts would be significant.

Alternative 2

Under Alternative 2, impacts from disruption of utilities and public services would be the same as those for Alternative 1 since the facilities to be constructed would be the same. Under Alternative 2, impacts related to short term disruption of utility or public services would be significant.

Alternative 3

Alternative 3 would exclude construction of a new Delta Intake or a Transfer-Bethany pipeline, and facility expansion at the Old River Intake would occur within its existing site, so there would be less potential for disruption of utilities and public services when compared with Alternative 1. However, there would be some potential for short-term disruption of utilities and public services resulting in a significant impact under Alternative 3.

Alternative 4

Under Alternative 4, impacts from disruption of utilities and public services would be substantially less than that generated by construction of Alternative 1 because Alternative 4 would not include facilities outside CCWD watershed property lines. Figure 4.12-1 shows the BBID, PG&E, Sprint, Western and other utility crossings that would be avoided.. Alternative 4 would include a dam raise for a 160 TAF reservoir expansion that would be smaller and involve less construction

activity than the dam raise required under Alternative 1 for the 275 TAF Reservoir, thereby avoiding inundation of 2 wind turbines. Further, there would be no potential for blocked driveways and other interferences with emergency personnel during construction. However, there would be some potential for short-term disruption of utilities and public services and an increased potential for wildfires resulting in a potentially significant impact under Alternative 4.

Mitigation Measures

Implementation of mitigation Transportation and Circulation Measure 4.9.2: This mitigation involves requirements to reduce the potential for impeding emergency access.

Implementation of mitigation Hazards Materials and Public Safety Measure 4.13.3: This mitigation involves required activities to reduce the potential risk of wildfires.

Measure 4.12.1a: Prior to construction of the project facilities and once pipeline alignments have been finalized, a detailed survey identifying utilities along the proposed alignments will be conducted. The survey results and the following measures will be incorporated into final design plans and specifications to avoid or minimize potential conflicts with utilities:

a. Utility excavation and encroachment permits will be acquired from the appropriate agencies, including the Public Works Departments of Contra Costa and Alameda Counties. CCWD will incorporate permit conditions in contract specifications that are designed to ensure no disruptions in service occur during construction. Contractors will be required to comply with permit conditions contained in contract specifications.

b. CCWD shall ensure that Underground Service Alert is notified at least 14 days prior to initiation of construction activities of the underground portions of each transmission lines and utility structures. Underground Service Alert verifies the location of all existing underground utilities and alerts the other utilities to mark their facilities in the area of anticipated construction activities.

c. A detailed engineering and construction plan will be prepared as part of the design plans and specifications. This plan will include procedures for the excavation, support, and fill of areas around utility cables and pipes to ensure that utility cables are not damaged. All affected utility service providers will be notified of the construction plans and schedule, and arrangements will be made with these entities regarding the protection, relocation, or temporary disconnection of services.

d. In shared utility easement areas where a project pipeline might parallel wastewater mains, the engineering and construction plans will include trench-wall support measures to guard against potential trench wall failure and the resulting loss of structural support for the wastewater main.

e. The California Department of Health Services standards will be observed; these standards require: (1) a 10-foot horizontal separation between parallel sewer and water mains (gravity or force mains); (2) a 1-foot vertical separation between perpendicular water and sewer line crossings; and (3) encasing sewer mains in protective sleeves where a new water line crosses under or over an existing wastewater main. If the separation requirements cannot be maintained, a variance will be obtained from

the Department of Health Services through the provision of sewer encasement or other means the department deems suitable.

f. Final construction plans and specifications will be coordinated with affected utilities including PG&E, Western, and the California Department of Health Services Sanitary Engineering Branch.

g. Emergency response plans and protocols, as required under construction permit conditions, shall be incorporated into project construction specifications.

Measure 4.12.1b: CCWD shall phase construction to minimize the potential for water supply emergencies and complete formal arrangements with EBMUD for water supply backup prior to draining the Los Vaqueros Reservoir and initiating project construction.

Impact Significance After Mitigation: Less than significant.

Impact 4.12.2: The project alternatives would not require or result in construction of new or expanded utility infrastructure or public service facilities that would result in substantial adverse physical impacts. (Less Than Significant Impact)

Overview – All Alternatives

For a finding of adverse significance related to Impact 4.12.2 to be made, two conditions must be met simultaneously: 1) the proposed project must require or result in construction of new or expanded utility infrastructure or public service facilities; and 2) those required facilities must result in substantial adverse physical impacts. Additional infrastructure, such as a new wastewater treatment facility or fire station, would be required in the event the project would result in an adverse effect on performance objectives during construction or operations such that additional services and new facilities would be required.

As indicated in the subsection 4.12.2 Significance Criteria discussion, above, the proposed reservoir expansion and related project components involve construction of expanded and new water facilities and infrastructure. As described in Section 3.4 Action Alternatives, these water-related and power supply facilities form the major components of the project; they do not require or result in the need for additional utility infrastructure or public service facilities that are not already integral parts of the proposed project. The potential for the utility and public service components of the project to cause adverse physical impacts is addressed in each technical section, where each impact discussion evaluates potential impacts associated with expansion of the reservoir, new pipelines and other facilities.

Also, as discussed in Section 4.20 Growth Inducement, the project does not involve development of new residential, commercial or industrial land uses, therefore none of the alternatives would directly or indirectly result in the kind of population growth or non-residential development that requires additional utilities and public services. However, in order to provide a comprehensive

assessment of potential impacts in this EIS/EIR, utility and public services (with the exception of water and power) are further assessed by alternative and by service type.

Alternative 1

Wastewater

Reservoir Expansion/ Dam Modification and Recreation Facilities. At present in Los Vaqueros Reservoir day-use areas, wastewater from the public restrooms and other facilities are regularly pumped and captured in a holding tank and hauled offsite by a licensed contractor. During construction, the reservoir would be closed to recreationalists and other visitors, and area use limited to CCWD staff and construction workers. Upon re-opening of the reservoir, new recreation facilities including a new interpretive center and marina complex could result in a substantial increase in visitors. However, the Los Vaqueros Reservoir's utility and recreational components are widely dispersed throughout the watershed such that there would not be a need to construct an on-site wastewater treatment plant system. After construction, CCWD would resume the existing system of wastewater treatment via off-site hauling.

New Delta Intake and Pump Station. The proposed intake facility would not have any staff assigned to this location and there would be no wastewater facilities provided at this location.

Transfer Facility Expansion. The existing transfer facility does not have any staff assigned to it and there are no wastewater facilities provided at this location. This situation would not change after the Expanded Transfer Facility is operational.

Drainage

As the project is almost completely located in a rural setting, much of the drainage system serving the project area consists of natural drainage swales, ditches, and watercourses. None of the project facilities would be constructed in areas with a developed storm sewer system. This situation would not change with construction of the proposed project. More information about drainage facilities, including more discussion of impacts, is addressed in Section 4.5, Local Hydrology, Drainage, and Groundwater.

Fire Protection/ Emergency Medical Services.

Reservoir Expansion/ Dam Modification and Recreation Facilities. Although recreational opportunities, including a new marina complex and more boats, will be enhanced, there will not be such a substantial increase in the annual number of visitors to the reservoir that additional fire engines, ambulances or a new fire station would be needed. More information about emergency medical services, including more discussion of impacts, is addressed in Section 4.9, Transportation and Circulation.

New Delta Intake and Pump Station. Like the existing Old River Intake and Pump Station, the new intake would require minimal fire monitoring and protection. Given the size of the new intake, dedicated fire personnel would not be required to provide fire protection for the new intake. Thus, the project would not increase long-term demand for public services or utilities,

including fire and police protection, additional schools, parks, wastewater and other public facilities, that would necessitate the construction of new or altered government service facilities.

Transfer Facility Expansion. The existing transfer facility does not have any staff assigned to it and there are no fire-prone facilities provided at this location. This situation would not change after the Expanded Transfer Facility is operational.

Law Enforcement

Reservoir Expansion, Dam Modification and Recreation Facilities. Although recreational opportunities, including a new marina complex and more boats, will be enhanced, there will not be such a substantial increase in the annual number of visitors to the reservoir that additional patrol vehicles or a police substation would be needed. The Los Vaqueros reservoir is available for day use only, its gates are locked each evening, and there is an on-site Marina manager that provides security (Mueller, 2008).

New Delta Intake and Pump Station. Like other District facilities, the new intake would be gated to provide site security, and it is not anticipated that dedicated security or police protection services would be required.

Transfer Facility Expansion. The existing transfer facility is gated, does not have any staff assigned to it and is not the type of facility that attracts law enforcement issues. This situation is not anticipated to change after the Expanded Transfer Facility is operational.

Power Supply Facilities. Like existing power supply substations, the new Western or PG&E substation would be gated to provide site security; it is not anticipated that dedicated security or police protection services would be required. Overhead transmission lines would not be fenced.

In summary, Alternative 1 would not require construction of new or expanded utility infrastructure or public service facilities. Therefore, there is no potential for project facilities that would result in substantial adverse physical impacts.

Alternative 2

Under Alternative 2, impacts related to utilities and public services would be the same as those for Alternative 1 since the project facilities to be constructed would be the same. Under Alternative 2, there is no potential for project facilities that would result in substantial adverse physical impacts.

Alternative 3

Like Alternative 1, Alternative 3 would not require construction of new or expanded utility infrastructure or public service facilities. Therefore, there is no potential for project facilities that would result in substantial adverse physical impacts.

Alternative 4

Like Alternative 1, Alternative 4 would not require construction of new or expanded utility infrastructure or public service facilities. Therefore, there is no potential for project facilities that would result in substantial adverse physical impacts.

Mitigation: None required.

Impact 4.12.3: Construction of the project alternatives could increase solid waste generation such that the capacity of local landfills would be exceeded or the project would not comply with state regulations related to solid waste. (Less than Significant)

Overview – All Alternatives

The Los Vaqueros Reservoir Expansion with construction of major facilities and their associated infrastructure have the potential to increase solid waste generation during the approximately 3-year project construction period. However, there would be relatively little trash hauled to landfills because there would no demolition of buildings and due to the high amount of clean excavation materials that would be re-used for backfill. There would also be re-cycling of wood, metal and other materials, diversion of tunnel spoils to designated areas or as road base, stockpiling of clean fill in a manner that will allow its subsequent re-use; and use of landfills as a final choice for solid waste disposal after other options have been exhausted. Contractors hauling waste to County transfer stations or landfills would be required to demonstrate reuse, recycling and diversion of construction debris prior to loads being accepted at those facilities.

Alternative 1

Los Vaqueros Reservoir Expansion and Dam Modification

Raising the Los Vaqueros Reservoir dam and construction of Appurtenant Facilities (i.e. – Spillway, Inlet-Outlet works and Hypolimnetic Oxygenation System) for the enlarged reservoir would generate substantial amounts of excess materials, especially during construction of the dam impoundment and also, to a lesser extent, during the relocation of existing recreational facilities. Under Alternative 1 approximately 1,000,000 cubic yards of wet alluvium and spoils (i.e., earth and rock excavated or dredged) would be excavated immediately upstream of the existing dam. No excavated materials would require off site disposal as excess earthen materials would be disposed within the reservoir inundation zone. Although not expected based on experience from construction of the original dam, any spoils or waste not suitable for the reservoir inundation zone would be hauled to a suitable location for recycling or disposal, depending on the type and volume of material to be disposed. Types of solid waste that would be removed include a minor amount of construction debris, including miscellaneous wood scraps, metals, and packaging materials for equipment would likely be hauled off-site to materials recycling facilities.

New Delta Intake Facility

Excess excavation materials from the transfer facility expansion or other construction would be used at the 20-acre new Delta Intake Facility. With its peat soils and need to expand the levee around the site, construction of the new Delta Intake Facility is unlikely to generate excess soil materials.

Conveyance Facilities

All Pipelines - Excavation and Backfill. An estimated 25 percent of the excavated soil would be hauled away from the work sites for disposal or reuse elsewhere. The remaining 75 percent would be stockpiled (sidecast) near the construction work zones for later use as backfill material. Trench dimensions of 48 feet wide by 27 feet deep (from the ranges of widths and depths presented in Chapter 3, Project Description) have been conservatively assumed for this analysis, and pipe diameters were also used to calculate the amount of hauled material, based on the volume displaced by the pipe itself. Pipe diameters are as follows:

- Delta-Transfer Pipeline (Alternatives 1 through 3) would be up to 96 inches in diameter.
- Transfer-LV Pipeline (Alternatives 1 through 3) would be up to 132 inches in diameter.
- Transfer-Bethany Pipeline (Alternatives 1 or 2) would be up to 132 inches in diameter.

Excess fill dirt not used to backfill trenches would be stored and reused as clean fill for other project components such as construction of levee improvements at the new Delta Intake Facility; due to the value of clean fill and the availability of space to store the fill until it is used, fill is unlikely to be hauled to one of 19 regional construction materials recycling facility.

Transfer Facility. Construction of the new 8 million-gallon (MG) tank during expansion of the Transfer Facility would generate approximately 270,000 cubic yards of excess fill dirt. This excess fill dirt would be stored and reused as backfill for other project components or sent to one of 19 regional construction materials recycling facilities.

Transfer-Bethany Pipeline - Excess Tunnel Material. Excavation of a tunnel under the Westside Option as part of the Transfer-Bethany Pipeline would create about 112,000 cubic yards of waste rock and tunnel spoils. The Eastside pipeline option would generate about 15,000 cubic yards of waste rock and tunnel spoils. Tunnel spoils would be hauled from the tunnel excavation for temporary onsite storage and/or subsequent final disposal. The larger waste rock would be disposed at either a 22-acre area near the terminus of Byron Hot Springs Road or along project access roads where it would be used as a roadway sub-base or surface. The Vasco Road Landfill could potentially serve as a disposal site for construction spoils near this project area, although landfill disposal is not anticipated for earthen materials.

Power Supply

Re-use of existing power poles, addition of new power poles and re-stringing of transmission lines would generate relatively small amounts of excess fill. However, during construction of a new substation, there is the potential for used power poles and other utility debris to be generated. Once

these facilities are constructed, operation of power supply facilities is anticipated to generate solid waste in quantities that are about the same as that generated under existing conditions.

Recreation Facilities

Relocation and re-construction of recreational facilities would generate relatively small amounts of excess fill. However, during construction of the new Marina Complex, Interpretive Center and other recreational facilities (Fishing Piers, Picnic Areas, Restrooms and Parking), there is the potential for construction debris to be generated If excess materials were not re-used, re-cycled or diverted from local landfills, non-reusable solid waste generated during construction would be taken to the nearest materials recovery facility/transfer station and transferred to Keller Canyon Landfill, a Class II facility with a projected lifespan of 40 years and sufficient permitted capacity to accommodate the anticipated solid waste disposal needs of the project.

Post Construction Operations

Once constructed, operation of recreation facilities at the Reservoir would continue to produce solid waste in a quantity that is approximately equivalent to that generated under existing operations; therefore, project operations would not substantially increase the amount of waste to be collected, transported, and disposed of at a regional landfill.

In summary, Alternative 1 would result in potentially significant impacts related to solid waste generation due to the scale of the project and amount of excess materials to be generated by dam modifications, pipeline and tunnel excavation and building of new utility and recreation structures.

Alternative 2

The discussion provided under Alternative 1 would apply to Alternative 2 because the facilities to be constructed under both alternatives would be the same. Under Alternative 2, solid waste generation would result in potentially significant impacts.

Alternative 3

Under Alternative 3, solid waste generation would be reduced as compared to Alternative 1 because there would be no construction of a new Delta Intake and Pump Station or Transfer-Bethany Pipeline. Without the Transfer-Bethany Pipeline construction, there would be no need for hauling and disbursing tunnel spoils for either the pipeline's Westside or Eastside Options. The Old River Intake and Pump Station would be expanded, however this expansions would be limited to on-site improvements. However, there would be the potential under Alternative 3 for solid waste generation to result in potentially significant impacts due to the amount of excess materials to be generated by dam modifications, pipeline excavation and building of new utility and recreation structures.

Alternative 4

All facilities included in Alternative 4 are analyzed under Alternative 1, above. There would be no improvements constructed at the Expanded Transfer Facility or new Delta Intake and Pump

Station under this alternative resulting in less solid waste generation than what has been determined under Alternative 1. However, there would be the potential under Alternative 4 for solid waste generation to result in potentially significant impacts due to the scale of the reservoir expansion and dam modifications.

Mitigation Measures

Measure 4.12.3: CCWD will incorporate into the contract plans and specifications the requirement that the contractor implement solid waste reduction and debris recovery practices as developed by CCWD. The solid waste reduction / debris recovery specifications will include the following items.

a. describe the planned management methods for all types of construction and demolition debris (e.g., reuse, recycling, or disposal), and indicate the types of debris expected to be generated by the project (e.g., wood, drywall, concrete, cardboard, and metal)

b. name all service providers and/or facilities to be used for debris management (or indicate that the debris, such as dirt, will be reused onsite)

c. demonstrate that at least 50 percent (by weight) of jobsite debris is diverted from disposal in a landfill by providing receipts and/or gate-tags from all facilities and service providers used to recycle, reuse, or dispose of jobsite debris.

Project waste generation would be avoided or minimized in a number of ways, which would be outlined in the project's solid waste reduction / debris recovery plan, and incorporated into project plans and specifications for implementation by contractors selected to complete project construction. To reduce solid waste generation, a series of practices would be developed, as follows:

Re-use of excavation backfill. Fill materials excavated during project grading and drilling would be reused as fill materials during project construction, while soils excavated during pipeline construction would be used to backfill trenches after pipeline installation.

Recycling of materials. Some construction materials, including some wood scraps, metals, and packaging materials could be recycled for later resale e.g. – wood scraps sold as landscape mulch.

Re-Use of excess fill. Clean fill could be accepted for use at other construction sites, or stored at existing sand and gravel facilities until (re)used as clean fill.

Roadway sub-base or surface material. Larger waste rock from excavation of tunnels would be placed along project access roads as a roadway sub-base or surface.

Divert waste to non-landfill locations. Additional amounts of the larger waste rock could be disposed of at a 22-acre area near the terminus of Byron Hot Springs Road.

Impact Significance after Mitigation: Less than Significant.

Impact 4.12.4: Construction of the project alternatives could make a cumulatively considerable contribution to cumulative effects on public services and utilities, or local landfill capacity. (Less than Significant with Mitigation)

Disruption of Utilities and Services

As indicated in the discussion related to Impact 4.12.1, construction of major facilities and their associated infrastructure have the potential to cause short-term disruptions in utility and public services during the approximately 3-year project construction period including limitations on reservoir use for approximately 5 years. This may be a planned shut off of electrical service in a limited area and for a limited duration while crossing existing utilities lines; alternatively, disruption of utilities could be unintentional. There is also some potential for extended disruption of electricity, gas or other utilities that could result in public health hazards, such as loss of power during an extended heat wave. If the proposed project were to be built concurrently with other area projects, there would be an increased potential for cumulative impacts. However, with implementation of Mitigation Measure 4.12-1a, impacts associated with disruption of utilities and public services are not anticipated being cumulatively considerable.

Additional Utilities and Services

As discussed under Impact 4.12.2, the project does not involve development of new residential, commercial or industrial land uses, and none of the alternatives would directly or indirectly result in the kind of population growth or non-residential development that requires additional utilities and public services. Assessment of all the proposed project facilities and alternatives indicated that the project would not require construction of new or expanded utility infrastructure or public service facilities. Furthermore, there is no potential for project facilities that would result in substantial adverse physical impacts; therefore the project would not contribute to significant cumulative impacts.

Solid Waste Generation

The Los Vaqueros Reservoir Expansion with construction of major facilities and their associated infrastructure have the potential to significantly increase solid waste generation during the approximately 3-year project construction period. State regulations related to solid waste require construction and demolition debris generated on a jobsite to be reused, recycled, or otherwise diverted. Contractors hauling waste to County transfer stations or landfills would be required to demonstrate reuse, recycling and diversion of construction debris prior to loads being accepted at those facilities. The project would incorporate activities and other requirements in order to minimize environmental impacts of solid waste generation, transport and disposal and meet requirements of AB 939. In the same way, other construction projects would be required to meet waste reduction standards, which would lower the potential for creating cumulative impacts related to solid waste. With implementation of Mitigation Measure 4.12-3, the proposed project impacts related to solid waste generation are not anticipated to be cumulatively considerable.

Mitigation Measures

Implementation of Mitigation Measures 4.12-1 and 4.12-3, including implementation of a solid waste reduction / debris recovery plan as required under AB 939, will reduce potential cumulative impacts to less-than-significant levels.

Impact Significance after Mitigation: Less than significant with mitigation.

4.13 Hazardous Materials / Public Health

This section discusses the hazardous materials and other hazard issues associated with project construction and project operations. The issues evaluated include the potential for toxic substances in soil and groundwater resulting from past use, spills, or leaks of hazardous materials into the ground in proposed construction areas as well as the potential of the project to generate and discharge hazardous materials during construction and operation.

This section also discusses potential impairment of emergency response or evacuation plans and the risk of wildland fires. In addition, specific to the proposed power supply facilities, this section addresses the issue of electric and magnetic fields (EMF) that could be associated with additional electrical transmission lines and substations proposed under some project alternatives.

4.13.1 Affected Environment

Regulatory Setting

Federal and State

Hazardous Materials and Waste Handling

The federal Resource Conservation and Recovery Act of 1976 (RCRA) established a "cradle-to-grave" regulatory program governing the generation, transportation, treatment, storage, and disposal of hazardous waste. Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements. In California, the Department of Toxic Substances Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous material waste. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; dictate the management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Throughout both Contra Costa County and Alameda County, a hazardous materials management plan must be prepared and submitted to the County by businesses that use or store certain quantities of hazardous materials.

Hazardous Materials Transportation

The U.S. Department of Transportation regulates hazardous materials transportation on all interstate roads. Within California, the state agencies with primary responsibility for enforcing federal and state regulations and for responding to transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). Together, federal and state agencies determine driver-training requirements, load-labeling procedures, and container specifications. Although special requirements apply to transporting hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.

Worker Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the work place. The California Division of Occupational Safety and Health (Cal-OSHA) and the federal Occupational Safety and Health Administration are the agencies responsible for assuring worker safety in the workplace.

Cal-OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices. At sites known to be contaminated, a site safety plan must be prepared to protect workers. The site safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

California Department of Forestry and Fire Protection

The California Public Resources Code (PRC) includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors[1] on construction equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire-suppression equipment that must be provided onsite for various types of work in fire-prone areas. The California Public Resources Code requirements would apply to construction activities in any areas designated by the California Department of Forestry and Fire Protection as a Wildland Area that May Contain Substantial Forest Fire Risks and Hazards pursuant to Section 4125 (CDF, 2000).

Electric and Magnetic Fields

No federal regulations have established environmental limits on the strengths of fields from powerlines. The State of California Department of Education enacted regulations that require minimum distances between a new school and the edge of a transmission line right-of-way (ROW). The setback distances are 100 feet from the edge of the transmission line ROW for 50- to 133-kilovolt (kV) lines, 150 feet from the edge of the transmission line ROW for 220- to 230-kV lines, and 350 feet from the edge of the transmission line ROW for 500- to 550-kV lines. These distances were not based on specific biological evidence, but on the fact that fields from powerlines drop to near background levels at those distances.

In 1993, the California Public Utilities Commission (CPUC) authorized the state's investor-owned utilities to implement "no and low-cost EMF avoidance measures" in the construction of new and upgraded utility projects. A CPUC decision on January 27, 2006, affirmed the Commission's November 1993 decision on a low-cost/no-cost policy to mitigate EMF exposure for new utility transmission and substation projects. As a measure of low-cost mitigation, the CPUC continues to use the benchmark of 4 percent of transmission and substation project costs for EMF mitigation, and to combine linked transmission and substation projects. In addition, the CPUC adopted rules and policies to improve utility design guidelines for reducing EMF levels near areas of human habitation; these guidelines include use of alternative sites, increased ROW, placement of facilities underground, and similar methods to reduce EMF levels at transmission, distribution,

[1] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.

and substation facilities by increasing the distance between people and facilities. As a federal agency, Western Area Power Administration (Western) is not subject to state regulations related to EMF.

California has no other rules governing EMF; however, CPUC-regulated utilities and municipal utilities use ratepayer funds to pay for their share of EMF research development costs. A $5.6 million, 4-year, non-experimental research program to be directed by Cal-OSHA was included in CPUC's January 27, 2006, decision. This program will provide utility participation in state, national, and international research to benefit ratepayers.

Local

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government and private agencies. Responding to hazardous materials incidents is one part of this plan, as is responding to intentional acts of destruction. Another part involves development of a downstream evacuation plan for areas within the potential inundation area. For both Contra Costa County and Alameda County, the plan is administered by the California Office of Emergency Services, which coordinates the responses of other agencies, including the California Environmental Protection Agency, CHP, California Department of Fish and Game, Regional Quality Control Board, and local fire departments. CCWD has a Los Vaqueros Reservoir Emergency Evacuation Plan for the current facility, discussed in Section 4.5 Local Hydrology, Drainage and Groundwater, Impact 4.5.5, which addresses the potential for inundation by dam or levee failure.

Contra Costa County also adopted the *Contra Costa County Hazardous Materials Area Plan*, which outlines the procedures that County regulatory and response agencies will use to coordinate management, monitoring, containment, and removal of hazardous materials in the event of an accidental release (Contra Costa County, 1996). Alameda County administers similar programs such as the *Hazardous Materials Business Plan Program* and the *California Accidental Release Program*. The former establishes minimum statewide standards for Hazardous Materials Business Plans, and the accidental release program requires businesses that handle more than threshold quantities of an extremely hazardous substance to develop a Risk Management Plan. Contractors for large public works projects that use fuels and other hazardous materials are required to develop Hazardous Materials Business Plans.

Contra Costa County

The Contra Costa County General Plan contains goals and policies to ensure public safety from hazardous materials in the county. These goals and policies include the regulation of stored hazardous materials and wastes (10-62); the required secondary containment and examination of stored toxic materials (10-63); the development of fire protection and prevention requirements for open space and rural area development (7-71); and the encouragement of wildland fire prevention activities (7-80) (Contra Costa County, 2005). Specific Contra Costa County goals and policies are listed in Appendix E-2.

Alameda County General Plan – East County Area Plan

The East County Area Plan (ECAP) addresses hazards, including wildland fires and airport hazards. The purpose of this plan is "to present a clear statement of the County's intent concerning future development and resource conservation within East County." The main policy relevant to the proposed project requires adherence to the provisions of the Alameda County Fire Protection Master Plan and Fire Hazard Mitigation Plan (319) (Alameda County, 2002). Specific ECAP goals and policies are listed in Appendix E-1.

Environmental Setting

Hazardous Materials

In accordance with federal and state laws, materials (including wastes) may be considered hazardous if they are specifically listed by statute as such or if they are poisonous (toxic); if they can be ignited by open flame (ignitable); if they can corrode other materials (corrosive); or if they can react violently, explode, or generate vapors when mixed with water (reactive). The term "hazardous material" is defined by law as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.[2]

In some cases, past industrial or commercial activities at a site could have resulted in hazardous materials spilling or leaking to the ground, resulting in soil and/or groundwater contamination. Federal and state laws require that hazardous materials be specially managed and that excavated soils with concentrations of contaminants, such as lead, gasoline, or industrial solvents that are higher than certain acceptable levels be specially managed, treated, transported, and/or disposed of as a hazardous waste. The California Code of Regulations, Title 22, Section 66261.20-24 contains technical descriptions of characteristics that would cause a soil to be designated a hazardous waste. The California regulations are compliant with the federal regulations and in most cases are more stringent.

Hazard, Risk, and Exposure

Factors that influence the health effects of exposure to hazardous material include the dose to which a person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility. The means by which an individual is exposed to a chemical agent is classically defined through the four basic exposure pathways: inhalation, ingestion, bodily contact, and injection.

The proposed project facilities are in southeastern Contra Costa County and northeastern Alameda County in an area that includes primarily open space and agricultural land, the majority of which is used for grazing. The closest communities to any project component are the towns of Byron and Discovery Bay, at distances of 4 and 6 miles, respectively, east/northeast and northeast from the Los Vaqueros Reservoir Watershed. The town of Byron has a relatively small population (fewer than 900 residents) and includes residential, commercial, and light industrial land uses. Discovery Bay, with about 9,000 residents, is known for its residential and water-based

[2] State of California, Health and Safety Code, Chapter 6.95, Section 25501(o).

recreation land uses. None of the project facilities would be in the towns of Byron or Discovery Bay, although the Delta–LV Pipeline extends along SR 4, which bounds the Discovery Bay community on the south.

Existing hazardous materials use in the project region varies and likely includes petroleum hydrocarbons and those hazardous materials common to agriculture, including pesticides, fertilizers, and fuels. Historical hazardous materials use likely involved the application of pesticides on the agricultural lands used for growing crops. Hazardous materials may also be present in surface soils along roadways as a result of accidental releases. In addition, subsurface soil or groundwater contamination related to hazardous material use is present in isolated commercial and light industrial properties throughout the region, discussed in the following paragraphs

In March 2007, Environmental Data Resources (EDR), Inc. conducted a review of regulatory agency databases for the project area to inventory sites of past hazardous materials releases (see **Table 4.13-1**) (EDR, 2007a and 2007b). The EDR database review was supplemented with a review of the online database, Geotracker, maintained by the State Water Resources Control Board (SWRCB, 2007), the Cortese List/Envirostor database maintained by the State Department of Toxic Substances Control (DTSC, 2007), and the Hazardous Materials Incident Search database produced by the Contra Costa County Hazardous Materials Program (CCCHMP, 2007).

The EDR database review identified four known or potential areas of contamination within a 1-mile radius of the proposed Transfer-Bethany Pipeline. Most of these areas would not affect or be affected by project construction because of their distances from the pipeline alignment. The closest recorded site to any of the proposed project components is the Souza Ranch landfill, which is an active facility that disposes of biosolids. This permitted landspreading[3] facility is between Armstrong Road and Vasco Road, about a quarter mile east of the proposed Transfer-Bethany Pipeline. No violations or areas of concern are reported for this facility. In and around Byron Airport, there are other similar landspreading facilities, but they are farther away from the proposed Transfer-Bethany Pipeline and more than 1 mile from the Western Transmission Line or any of the other Power Supply elements.

Other potential sites where hazardous materials are handled close to the proposed project components include a relatively new gasoline service station at the northeast corner of Bixler Road and SR 4, and next to the proposed Delta-Transfer Pipeline; a boat-storage yard at the southwest corner of that same intersection, also next to the proposed Delta-Transfer Pipeline; and the Unimin sand plant at the southwest corner of the intersection of Vasco Road and Camino Diablo Road, next to the proposed Transfer-Bethany Pipeline. However, none of these facilities were listed on any of the databases reviewed, which indicates that no reported leaks or spills are associated with these sites. In addition, according to the available databases reviewed as part of this analysis, no hazardous materials leaks or spills have occurred within the Los Vaqueros Watershed.

[3] Landspreading organic material involves incorporating the materials into the soil where they are biologically broken down and remain in the soil as nutrients.

TABLE 4.13-1
DESCRIPTION OF ENVIRONMENTAL DATABASES

Acronym / Permitted Uses	Name and Description of Database
CONTRA COSTA Sites	Contra Costa County Hazardous Materials Incident Search. Sites in Contra Costa County with Underground Storage Tanks (USTs) as well as hazardous waste generators and facilities that have submitted a hazardous materials business plan.
DRY CLEANERS	The Dry Cleaner Facilities Database. Dry cleaner-related facilities that have U.S. EPA identification numbers.
CA SLIC	Spills, Leaks, Investigation, and Cleanup Cost Recovery Listing. Sites under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board. Found on the Geotracker Database.
CALSITES	Previously referred to as the Abandoned Sites Program Information System (ASPIS), this list identifies potential hazardous waste sites, which are then screened by the DTSC for further action. Now replaced by DTSC's Envirostor.
NPL	National Priorities List compiles over 1,200 sites for priority cleanup under the Superfund Program.
CORTESE	Cortese Hazardous Waste and Substances Site List. A compilation of sites listed in the LUST, Solid Waste Information System (SWF/LF), and CALSITES databases.
LUST	Leaking Underground Storage Tanks (LUST). A compilation of LUST sites.
REF	Unconfirmed Properties Referred to Another Agency. Properties where contamination has been confirmed and that were determined not to require direct DTSC Site Mitigation Program action or oversight.
VCP	Voluntary Cleanup Program Properties. Low-threat properties with either confirmed or unconfirmed releases, where the project proponents have requested that the DTSC oversee investigation and/or cleanup activities.
US Brownfields	Maintained by the U.S. EPA, the US Brownfields database lists abandoned sites that have known or suspected contamination that are currently underutilized.
Toxic Pits	Maintained by the State Water Resources Control Board, the Toxic Pits database lists sites suspected of containing hazardous substances that have not yet been cleaned up.
State Landfill	Solid waste facilities and landfills that are active, closed, or inactive.
Indian LUST	Leaking underground storage tanks on Indian lands.

ASPIS: Abandoned Sites Program Information System
DTSC: Department of Toxic Substances Control
LUST: Leaking Underground Storage Tanks
SWF/LF: Solid Waste Information System
UTS: Underground Storage Tank

SOURCE: EDR, 2007a and 2007b.

Naturally Occurring Asbestos

Asbestos is a naturally occurring fibrous group of minerals. Chrysotile, which is found in the serpentine group,[4] is the most common asbestos mineral in California. Small amounts of chrysotile asbestos, a fibrous form of serpentine minerals, are common in serpentinite. When disturbed, the asbestos fibers can become airborne and present a public health risk when inhaled. The California Geological Survey has mapped California for the occurrence of ultramafic rocks, which have the

[4] Serpentine is a naturally occurring group of minerals that can be formed when ultramafic rocks are metamorphosed during uplift to the earth's surface. Serpentinite is a rock consisting of one or more serpentine minerals. This rock type is commonly associated with ultramafic rock along earthquake faults.

highest potential for serpentine. A review of the map shows that the proposed project elements are not anywhere near these mapped locations; therefore, the potential for encountering naturally occurring asbestos during construction is considered very low (CGS, 2000).

Wildland Fire

The California Department of Forestry and Fire Protection has identified two types of wildland fire risk areas: (1) Wildland Areas That May Contain Substantial Forest Fire Risks and Hazards, and (2) Very High Fire Hazard Severity Zones. Each risk area contains requirements to reduce the potential risk of wildland fires fire safety, such as through regulations that restrict the use of equipment that may produce a spark, flame, or fire; that require the use of spark arrestors on construction equipment with an internal combustion engine; that specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and that specify fire-suppression equipment that must be provided onsite for various types of work in fire-prone areas.

The proposed project facilities lie partially within an area considered to be a Wildland Area That May Contain Substantial Forest Fire Risks and Hazards. The majority of the open space west of the Byron Highway/railroad tracks is mapped as a hazard area (CDF, 2000). No Very High Fire Hazard Severity Zones are within the project vicinity. Therefore, public safety requirements to minimize the risk of wildland fire would apply to construction activities within the Los Vaqueros Watershed (including construction areas for the Dam Raise, appurtenant facilities, and borrow areas). Affected conveyance facilities include the western portion of the Delta-Transfer Pipeline; Transfer Facility Expansion; Transfer-LV Pipeline; and the western portion of the Transfer-Bethany Pipeline. Power Supply Option 2 (Western & Pacific Gas and Electric [PG&E]), with a potential new PG&E substation, would also be in the identified wildland fire hazard area. The proposed recreation facilities are within the CCWD watershed and would be subject to these code requirements as well.

Electric and Magnetic Fields

Electrical transmission facilities generate EMF. The possibility of adverse health effects from EMF exposure has increased public concern in recent years about living near high-voltage transmission lines. The available evidence has not established that such fields pose a significant health hazard to exposed humans. Therefore, in light of present uncertainty, CPUC guidelines are incorporated into the design of new facilities to reduce such fields through no cost and low cost (up to 4 percent of facility cost) measures until the issue is better understood.

As stated in the Regulatory Setting, guidelines adopted by the CPUC include use of alternative sites, increased ROW, placement of facilities underground, and similar methods to reduce EMF levels at transmission, distribution, and substation facilities by increasing the distance between electrical facilities and human habitation areas. As previously discussed, no federal or state regulations have established environmental limits on the strengths of fields from powerlines. Furthermore, as a federal agency, Western is not subject to state regulations; however, Western may voluntarily incorporate CPUC requirements into a project design. Additional background information is provided prior to the discussion of possible EMF effects.

Both voltage and current are required to transmit electrical energy over a transmission line. Voltage represents the potential for an electrical charge to do work and is measured in volts (V) or kV. Voltage is the source of an electrical field. Current, a flow of electrical charge measured in amperes, is the source of a magnetic field.

All transmission lines generate EMF. The existing and new transmission lines would generate similar EMF. The electrical effects of a transmission line can be characterized as "corona effects" and "field effects." Corona is the electrical breakdown of air into charged particles. It is caused by the electrical field at the surface of conductors. Field effects are induced currents and voltages, as well as related effects that might occur due to EMF at ground levels. Issues of concern related to EMF include: human health and safety hazards from direct and cumulative EMF exposure, EMF effects on livestock, and television interference.

Corona Effects

Corona can occur on the conductors, insulators, and hardware of an energized high-voltage transmission line. Corona on conductors occurs at locations in which the field has been enhanced by protrusions, such as nicks, insects, dust, or drops of water. During fair weather, the number of these sources is small, and the corona effect is less than significant. However, during wet weather, the number of these sources increases and corona effects are much greater. Effects of corona are audible noise, radio and television interference, visible light, and photochemical reactions.

Field Effects

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, transmission structures, vegetation, buildings, vehicles, and persons. The electric field is measured in units of kV/meter, at a height of 1 meter above ground level. Field effects can include induced currents, steady-state current shocks, spark discharge shocks and, in some cases, field perception.

Induced Currents. When a conduction object, such as an ungrounded fence, vehicle, or person is placed in an electric field, current and voltages are induced. The magnitude of the induced current depends on the electric field strength and the size and shape of the object. The induced currents and voltages represent a potential source of nuisance shocks near a high-voltage transmission line. Typically, high-voltage transmission lines are placed high above objects to reduce the potential for nuisance shocks. In addition, permanent structures near transmission lines, such as fences, gates, and metal buildings, are grounded.

Spark-Discharge Shocks. If the induced voltage was sufficiently high on an ungrounded object, a spark-discharge shock would occur as contact is made with the ground. Under typical transmission line design practices, the magnitude of the electric field would be low enough that this type of shock would occur rarely, if at all. Carrying or handling conducting objects, such as irrigation pipes, under transmission lines can result in spark discharges that are a nuisance. The primary hazard with irrigation pipes or any other long objects, however, is electrical flashover from the conductors if a section of the pipe is inadvertently tipped up near the conductors.

Steady-State Current Shocks. Steady state currents are those that flow continuously after a person contacts an object, such as an ungrounded fence, and provides a path to the ground for the induced current. The effects of these shocks may include involuntary movement of a person.

Field Perception and Neurobehavioral Responses. When the electric field under a transmission line is sufficiently strong, it can be perceived by hair rising on the back of one's hand. At locations directly under the conductors, it is possible for some individuals to perceive the field while standing on the ground. Perception of the field does not occur at or beyond the edge of a ROW.

Magnetic Field

A 60-hertz magnetic field is created in the space around transmission-line conductors by the electric current flowing in the conductors. The magnetic field is expressed in units of microteslas (μT) and in gauss or milligauss (mG), where 1 mG is one thousandth of a gauss (1 μT = 10mG). The maximum magnetic fields of transmission lines are similar to the maximum magnetic fields measured near some common household appliances. The actual level of the magnetic field would vary as the current on the transmission line and the distance to the line varies. There are no established health-based limits exist for peak magnetic fields. A possible short-term effect associated with magnetic fields from alternating current transmission lines is induced voltages and currents in long-conducting objects such as ungrounded fences and above-ground pipelines.

Health Effect

Before health-based concern developed, measures to reduce field effects from powerline operations were mostly aimed at the electric field component, which can cause radio noise, audible noise, and nuisance shocks. The present focus is on magnetic fields, because these can penetrate building materials and potentially produce the types of health impacts at the root of the present concern.

It is important to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (NIEHS, 2002). There is also discussion of cell phones as a source of EMF, although it is measured in relatively low levels. Scientists have not established which types of exposures would be more biologically meaningful. High-level magnetic field exposures regularly occur in areas other than the powerline environment. Examples of magnetic fields at particular distances from household appliance surfaces are listed in **Table 4.13-2**.

As described in Section 3.5.5 Power Supply Infrastructure, Alternatives 1, 2, and 3 would involve construction of new power supply facilities to support the operation of the expanded Los Vaqueros system. New electrical transmission lines would be extended to the new Delta Intake and Pump Station under Alternatives 1 and 2, and to the Expanded Transfer Facility under Alternatives 1, 2, and 3. A new electrical substation would be required in the project area under Alternatives 1, 2, and 3, depending on which of two power supply options is adopted. No new power supply facilities are included in Alternative 4.

TABLE 4.13-2
MAGNETIC FIELDS FROM HOUSEHOLD APPLIANCE SURFACES

Appliance	Milligauss at 1 foot	Milligauss at 3 feet
Can opener	7.19 to 163.02	1.3 to 6.44
Clock	0.34 to 13.18	0.03 to 0.68
Clothes iron	1.66 to 2.93	0.25 to 0.37
Coffee machines	0.09 to 7.30	0 to 0.61
Computer monitor	0.20 to 134.7	0.01 to 9.37
Dishwasher	4.98 to 8.91	0.84 to 1.63
Fax machines	0.16	0.03
Portable fan	0.04 to 85.64	0.03 to 3.12
Range	0.60 to 35.39	0.05 to 2.83
Television	1.80 to 12.99	0.07 to 1.11

SOURCE: Zaffanella, 1997

Two options for provision of this additional power supply are evaluated. Under Power Option 1, Western would extend additional transmission lines to both the new Delta Intake and Pump Station and the Expanded Transfer Facility from a new Western substation (see Figure 3-26). Under Power Option 2, PG&E would construct a new substation in the project area to extend power to the Expanded Transfer Facility (see Figure 3-27).

Power Option 1 (Western Only). Western would provide power to the new Delta Intake and Pump Station and the Expanded Transfer Facility. An existing 230-kV transmission line along Western's existing transmission corridor from Western's Tracy Substation to a new substation in the project area would not require any upgrades. From this proposed new substation a new 69-kV transmission line would be extended east to the new Delta Intake and Pump Station, next to the existing 69-kV line that extends to the existing Old River Intake and Pump Station. No residences are located along the alignment for the new 69-kV line that would extend from the substation to the new Delta Intake and Pump Station. At the new intake site, however, this new powerline would be a minimum of 500 feet from an existing farmhouse across Old River on Victoria Island.

The siting zone of the proposed 2-acre Western substation is at the eastern terminus of Camino Diablo Road, where Western's existing 230-kV towers end and the 69-kV power poles that extend to the Old River Pump Station begin. The new substation would have the capacity to step power down from 230 kV to 69 kV and 21 kV. A farmhouse is about 100 feet east of the existing transmission corridor; which contains two PG&E 500-kV lines as well as a 69-kV Western powerline. Because the 2-acre substation could be in any part of the siting zone, the substation could be as far as 1,275 feet from this house.

To serve the Expanded Transfer Facility under Option 1, a new 21-kV distribution line would be extended from the new substation west to the Transfer Facility. The new transmission line would parallel the existing 230-kV transmission line for a segment and then would extend westward, generally traversing the same alignment as the Delta-Transfer Pipeline to the Expanded Transfer Facility.

The proposed Delta-Transfer Pipeline would be constructed within an existing CCWD utility easement that contains an existing water pipeline. Within this utility ROW, the new 21-kV line could be within 50 feet of the closest homes on SR 4, Bixler Road, Kellogg Creek Road, and Hoffman Lane, potentially including Discovery Bay homes along SR 4.

Power Option 2 (Western & PG&E). Western would provide power to the new Delta Intake and Pump Station as described under Option 1. PG&E would provide power to the Expanded Transfer Facility through a new PG&E distribution substation constructed in the Los Vaqueros Watershed. This new substation would have the capacity to step power down from an existing 230-kV PG&E transmission line to a 21-kV powerline. The closest residence to the proposed substation would be over 1,500 feet to the north.

The approximately 1.5-mile-long, 21-kV distribution line would begin at the proposed 230-kV PG&E substation about 2,600 feet south of the intersection of Walnut Boulevard and Camino Diablo Road. It would follow an existing distribution line route west, cross Walnut Boulevard, and head north, paralleling Walnut Boulevard to the intersection of Camino Diablo Road. From there it would cross Walnut Boulevard and traverse east on the south side of Camino Diablo, cross Camino Diablo Road and traverse north on the west side of Longwell Avenue, and cross Kellogg Creek and traverse on the north side of an existing access road on the Expanded Transfer Facility property. The proposed 21-kV transmission lines would pass as close as 50-feet west of homes on Walnut Boulevard.

For the new electrical transmission facilities, EMF, measured under the lines and at the edge of the utility ROW, would vary, depending upon the configuration of the circuits and operation of the lines. Circuits placed parallel to each other tend to cancel EMF, thus reducing the measured fields under the lines and at the edge of the ROW. Fields and currents can be induced on nearby ungrounded fences, irrigation pipes, and other metallic objects.

4.13.2 Environmental Consequences

Methodology

Analysis of the potential for construction activities associated with the project to encounter subsurface hazardous materials was conducted by reviewing the land uses and databases that describe past hazardous materials releases in light of the proposed facility site locations. The discussion also addresses the potential for discovery of unreported hazardous materials releases.

Analysis of the project's potential to release hazardous materials was conducted by identifying the hazardous materials that would be used for the project, estimating the general quantity of such materials, and assessing the risk of a release. Impacts on emergency response/evacuation were analyzed by reviewing the relevant plans and identifying any conflict with these plans. Impacts on wildland fire risk were analyzed by comparing the state's fire risk maps to the project facilities site locations. Finally, potential for EMF effects associated with the proposed electrical transmission facilities is based on the distance of these facilities from schools.

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 California Environmental Quality Act (CEQA) Guidelines. These thresholds also encompass the factors taken into account under the National Environmental Policy Act (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 hazardous materials and public health if it would do any of the following:

- Expose construction workers to hazardous materials that would create health risks during construction
- 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 a quarter mile of an existing or proposed school (not analyzed in this section)
- Be on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code 65962.5
- Expose people or structures to a significant risk of loss, injury, or death from wildland fires
- Locate electrical transmission facilities less than 150 feet from the property line of an existing or approved school site
- Result in a safety hazard for people residing or working in a project area that is within 2 miles of a public airport or public-use airport (not analyzed in this section)
- Impair implementation of or physically interfere with Alameda County and/or Contra Costa County's emergency response and evacuation plans (not analyzed in this section)

No acutely hazardous materials would be used in project construction or operations, and none of the proposed project facilities where hazardous materials (such as fuels) might be used in operations, would be built within a quarter mile of an existing or proposed school. Therefore, this issue is not addressed further in this impact analysis.

The nearest airport to the proposed project facilities is the Byron Airport (a public airport), which is about 5 to 6 miles east of Los Vaqueros Reservoir and about 1 mile east of the proposed Transfer-Bethany Pipeline. Construction activities near the Byron Airport are discussed in Section 4.7 Land Use, under Impacts 4.7.3 and 4.7.4. Therefore, this issue is not addressed further in this impact analysis.

None of the project components would be constructed on a site that is included on any list of hazardous materials sites, including the list compiled pursuant to Government Code section 65962.5. Accordingly, the effects of construction on such a site are not discussed further in this section.

Most proposed project components are outside of road ROW or other evacuation routes and would not interfere with any emergency response plans or evacuation plans. The Reservoir Expansion/Dam Modification and recreation facilities are within the CCWD watershed. Outside of the watershed property, most of the facilities would be underground pipelines or structures on CCWD property (i.e., Delta Intake Facilities and Transfer Facility Expansion). Exceptions include Power Supply transmission poles and new substations. Because overhead powerlines are easily traversable by roads and the project components are relatively dispersed across the large project area and would not otherwise interfere with implementation of any emergency response plans or evacuation plans, this topic is not discussed further in this section. See also Section 4.9 Transportation and Circulation, Impact 4.9.2, for additional discussion of emergency vehicle access and Mitigation Measure 4.9.2, which addresses requirements of a project traffic control and safety assurance plan.

Impact Summary

Table 4.13-3 provides a summary of the impact analysis for issues related to hazardous materials/public health based on actions outlined in Chapter 3.

TABLE 4.13-3
SUMMARY OF IMPACTS – HAZARDOUS MATERIALS / PUBLIC HEALTH

Impact	Project Alternatives			
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
4.13.1: Construction of the project and alternative components would disturb subsurface soils and groundwater; if hazardous substances are present in the disturbed areas, construction workers and the public could be exposed to these substances.	LS	LS	LS	LS
4.13.2: Project construction and operation could, through routine transport, use or disposal, accidentally release hazardous materials, thereby exposing construction workers, project personnel, and the public to hazardous materials, or accidentally releasing hazardous materials into the soil, groundwater, and/or a nearby surface water body.	LSM	LSM	LSM	LSM
4.13.3: Improper handling or use of flammable or combustible materials such as internal combustion equipment could result in wildland fires, exposing people or structures to a significant risk of loss, injury, or death.	LSM	LSM	LSM	LSM
4.13.4: Construction and operation of project power supply facilities would not locate electrical transmission facilities within 150 feet of a school.	NI	NI	NI	NI
4.13.5: The project alternatives would not contribute to cumulative impacts associated with release of hazardous materials or other hazards.	LS	LS	LS	LS

SU = Significant and Unavoidable
LSM = Less-than-Significant Impact with Mitigation
LS = Less-than-Significant Impact
NI = No Impact

Impact Analysis

No Project / No Action Alternative

Under the No Project/No Action Alternative, no new facilities would be constructed. Therefore, this alternative would not result in any impacts on public health or safety related to hazards or hazardous materials.

Impact 4.13.1: Construction of the project and alternative components would disturb subsurface soils and groundwater; if hazardous substances are present in the disturbed areas, construction workers and the public could be exposed to these substances. (Less than Significant)

Alternative 1

The proposed areas of ground disturbance would be in rural and agricultural areas of eastern Contra Costa and Alameda Counties. None of the project components would be within the towns of Byron or Discovery Bay. Although most of the project area has not been used for commercial, industrial or other urban uses, and large portions are used as open grazing land, some of the project components could be in or near areas with a history of hazardous materials use. If areas of contamination were encountered, construction workers and potentially the public would be exposed to contaminated soil particulates and, potentially, to chemical vapors.

Reservoir Expansion and Recreational Facilities. Alternative 1 involves a 275 thousand acre-feet (TAF) Reservoir Expansion/Dam Modification with borrow areas, and recreation facilities constructed within CCWD watershed property lines. Review of available environmental regulatory databases for known current and historical sites of hazardous materials storage, generation, use, and/or disposal did not reveal any known sites within CCWD property, including any areas proposed for construction.

Delta Intake Facilities. Construction of a new Delta Intake and Pump Station would occur in an agricultural area apart from existing communities and other sensitive land uses. Review of available environmental regulatory databases for known current and historical sites of hazardous materials storage, generation, use, and/or disposal did not reveal any known sites near the proposed site of the new Delta Intake Facility.

Conveyance Facilities. Under Alternative 1, construction of three water conveyance pipelines and expansion of the existing Transfer Facility would occur. The Delta-Transfer Pipeline would lie along SR 4 within an existing transportation corridor. The Transfer Facility Expansion would occur on CCWD land next to the existing Transfer Facility. The Transfer-LV Pipeline alignment would also use an existing roadway corridor. The Transfer-Bethany Pipeline would pass south along Vasco Road and then over range land into Alameda County.

According to a review of environmental databases, the closest database site to any of the proposed project components is the Souza Ranch landfill at 6100 Armstrong Road, east of North Vasco Road. This landfill is about a quarter mile east of the proposed Transfer-Bethany Pipeline.

This permitted active facility disposes of sludge (biosolids) and has no reported violations or areas of concern. In and around the Byron Airport, there are other similar landspreading facilities, including the Byron Hot Springs Landspreading and the Airport Ranch Sludge Spreading facilities. Byron Hot Springs Landspreading is at 5400 Byron Hot Springs Road, which is about 1.5 miles east of the proposed Transfer-Bethany Pipeline. The Airport Ranch Sludge Spreading facility is at Holey Road, almost adjacent to the Byron Airport and about 2 miles east of the proposed Transfer-Bethany Pipeline. However, there are no reported violations or areas of concern for any of these facilities, which are, in any event, at distances that would be unlikely to affect construction activities associated with the proposed project.

There are also no reported spills or leaks associated with the other nearby sites, such as the service station at Bixler Road and SR 4, the boat storage yard, and the Unimin sand plant. Based on the lack of any identified release associated with these facilities, their potential to affect humans at the proposed project elements is considered very low.

Power Supply. To accommodate a new Delta Intake and Pump Station as well as the expansion of the Transfer Facility, additional overhead electrical powerlines and a substation would be required. Two options for electrical facilities currently under consideration include Power Options 1 and 2. Construction of Power Option 1 includes a new powerline from the Western substation to the new Delta Intake facilities, with a new Western substation at the eastern terminus of Camino Diablo Road. Power Option 2 would entail a new PG&E substation within the CCWD watershed property in an area to the north of the staging area, plus a new distribution line connecting the new PG&E substation to the expanded Transfer Facility. Review of available environmental regulatory databases for known current and historical sites of hazardous materials storage, generation, use, and/or disposal did not reveal any known sites within a mile of the power supply facilities.

Unforeseen Hazardous Conditions. Existing federal, state and local worker safety and emergency response regulations (see subsection 4.13.1) require that if any unforeseen hazardous conditions are discovered during construction, the contractor coordinate with the appropriate agencies for the safe handling, sampling, transportation, and disposal of encountered materials. Alameda and Contra Costa counties have adopted County Hazardous Materials Area Plans (for their respective jurisdictions) that outline the procedures that county regulatory and response agencies will use to coordinate management, monitoring, containment, and removal of hazardous materials in the event of an accidental release (Contra Costa County, 1996). The contractor would also be required to comply with Cal-OSHA worker health and safety standards that ensure safe workplaces and work practices. The impacts of Alternative 1 would be less than significant.

Alternative 2

The facilities included in Alternative 2 would be the same as those under Alternative 1. Therefore, the impacts of Alternative 2 would be less than significant.

Alternative 3

Construction of Alternative 3 would include the same components as Alternative 1, except that expansion of the Old River Intake and Pump Station would occur within the facility's existing site area and Alternative 3 would not include a new Delta Intake and Pump Station or the Transfer-Bethany Pipeline. As such, no database sites are identified at or next to Alternative 3 project components. As with Alternatives 1 and 2, the impacts of Alternative 3 would be less than significant.

Alternative 4

Alternative 4 would involve a 160-TAF Reservoir Expansion/Dam Modification with two borrow areas and recreational facilities to be constructed within CCWD watershed property lines. Under this alternative, the existing Transfer Facility would be upgraded; but this facility would not expand its footprint as would occur for other alternatives.

Alternative 4 would exclude construction of any Delta Intake and Pump Station, Conveyance or Power Supply facilities, and would avoid ground disturbance in areas with hazardous materials. As with Alternatives 1, 2, and 3, the impacts of Alternative 4 would be less than significant.

Mitigation: None required.

Impact 4.13.2: Project construction and operation could, through routine transport, use or disposal, accidentally release hazardous materials, thereby exposing construction workers, project personnel, and the public to hazardous materials, or accidentally releasing hazardous materials into the soil, groundwater, and/or a nearby surface water body. (Less than Significant with Mitigation)

Alternative 1

Under Alternative 1, there would be construction and operation activities that would require use of limited quantities of hazardous materials such as fuels, oils, grease, lubricants, and glues. The improper use, storage, handling, or disposal of hazardous materials could allow hazardous releases from equipment or through other means during project construction or operation activities, thereby exposing construction workers and CCWD personnel to hazardous materials. There could also be accidental or intentional acts of destruction, including releases of hazardous materials that would contaminate soil or degrade water quality. The types and quantities of hazardous materials would vary throughout construction of the project but would likely involve minor quantities (less than 5 gallons) of miscellaneous substances (e.g., paint and solvents) at each work area and explosives at the borrow area.

The primary hazardous materials handled would be fuel, hydraulic fluid, and engine oil in quantities that would likely be in the range of hundreds of gallons over the course of construction. The most likely area for potential release of fuel, hydraulic fluid, oil, and other substances would be

around the mechanics' yard. All hazardous materials would be contained and stored according to the manufacturer's recommendations and hazardous material storage requirements.

For construction of the Reservoir Expansion project and other stationary facilities, refueling the construction equipment could occur in one location on the construction site and, if access allows, the refueling vehicle may also be taken out to a piece of equipment. Routine maintenance and refueling would occur in available parking areas and major maintenance in the CCWD watershed mechanics yard. For the construction of pipelines, power poles, and other facilities that traverse the project area, the contractor will use a fuel vehicle to refuel construction equipment in a manner that protects water quality, as restricted under Mitigation Measure 4.5.1a. Regulatory compliance procedures would be in place to contain spillage during refueling and other maintenance.

For facility operations after construction is completed, CCWD would be required to update its existing permits and comply with appropriate regulations. For the purposes of maintenance during operations, the project would continue to handle and store limited quantities of hazardous materials such as paints, solvents, fuels, and oil, but in far smaller quantities than during construction. CCWD would update its existing *Emergency Response Plan and Hazardous Materials Business Plan,* which would state quantities stored and provide handling procedures to ensure the safety of workers and the public.

Due to the extent and duration of construction and the common use of hazardous materials such as fuels, oils, grease, lubricants, and glues during construction, Alternative 1 has the potential to expose people and the environment to accidental releases of hazardous substances, resulting in a significant impact.

Alternative 2

The facilities and construction procedures included in Alternative 2 would be the same as those in Alternative 1. Therefore, this alternative also has the potential to expose people and the environment to accidental releases of hazardous substances, resulting in a significant impact.

Alternative 3

Construction of Alternative 3 would include the same components and construction procedures as Alternative 1, except that expansion of the Old River Intake and Pump Station would occur within that facility's existing site area, and Alternative 3 would not include a new Delta Intake and Pump Station or the Transfer-Bethany Pipeline. As with Alternative 1, Alternative 3 has the potential to result in exposing people and the environment to an accidental release of hazardous substance, resulting in a significant impact.

Alternative 4

Alternative 4 would involve a 160-TAF Reservoir Expansion/Dam Modification project with two borrow areas and recreational facilities to be constructed within CCWD watershed property lines. Under this alternative, the existing Transfer Facility capacity would be upgraded; however, this

facility would not expand its footprint as would occur for the other alternatives. Alternative 4 would exclude construction of any Delta Intake and Pump Station, Conveyance, or Power Supply facilities and would avoid ground disturbance in areas with hazardous materials. Alternative 4 involves a smaller project that would require less time to complete construction. The same construction procedures would be in place, however, to prevent hazardous material spills. Alternative 4, like Alternative 1, could result in exposing people and the environment to accidental releases of hazardous substances; however, based on the overall reduction in construction time and equipment necessary, the potential impact would be reduced. This would be a significant impact.

Mitigation Measures

Implementation of Mitigation Hydrology Measures 4.5.1a and 4.5.1b: These measures involve protection of water quality.

Measure 4.13.2: CCWD will incorporate into the contract specifications that require the contractor to enforce strict onsite best management practices (BMPs) to keep hazardous materials from accidental release. These practices will include, without limitation, designating a central storage area to keep hazardous materials away from any waterways and storm drain inlets; refueling equipment in designated areas; containing contaminants away from any waterways or storm drain inlets; preparing a spill prevention, control, and countermeasure plan; and regularly inspecting construction vehicles for leaks.

Impact Significance after Mitigation: Less than Significant.

Impact 4.13.3: Improper handling or use of flammable or combustible materials such as internal combustion equipment could result in wildland fires, exposing people or structures to a significant risk of loss, injury, or death. (Less than Significant with Mitigation)

Alternative 1

The rural areas of Contra Costa and Alameda Counties in which the proposed project would be constructed are dominated by grasslands, shrublands, and woodlands. The relatively dry climate conditions make the fire regime rich with fuels, although areas with active grazing, agricultural irrigation, and landscape irrigation provide some fuel reduction. Wildland fires in this region are largely caused by human activities as opposed to lightning-ignited fires. The most likely source of an ignition from the proposed project would be from construction and construction-related activities, such as welding, re-fueling, or use of other fuel-motorized equipment.

As previously discussed in the Environmental Setting section, the proposed project elements of Alternative 1 lie partially within an a Wildland Area That May Contain Substantial Forest Fire Risks and Hazards (CDF, 2000). The majority of the open space west of the Byron Highway/railroad tracks is mapped as a hazard area. Affected conveyance facilities include the western portion of the Delta-Transfer Pipeline; Transfer Facility Expansion; Transfer-LV Pipeline; and the western portion of the Transfer-Bethany Pipeline. Power Option 2, with a potential

new PG&E substation, would also be in the identified wildland fire hazard area as would the recreation facilities. As such, construction activities would be required to adhere to fire safety measures that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire-suppression equipment that must be provided onsite for various types of work in fire-prone areas.

Due to the extent and duration of project construction as well as activities such as welding, re-fueling, and use of fuel-motorized equipment, Alternative 1 has the potential to expose people and structures to wildland fires. This impact would be significant.

Alternative 2

The facilities and construction procedures included in Alternative 2 would be the same as those in Alternative 1. Therefore, this alternative has the potential to expose people and structures to wildland fires. This impact would be significant.

Alternative 3

Construction of Alternative 3 would include the same components and construction procedures as Alternative 1, except that expansion of the Old River Intake and Pump Station would occur within that facility's existing site area and Alternative 3 would not include a new Delta Intake and Pump Station or the Transfer-Bethany Pipeline. As with Alternative 1, Alternative 3 has the potential to expose people and structures to wildland fires. This impact would be significant.

Alternative 4

Alternative 4 would involve a 160-TAF Reservoir Expansion/Dam Modification project, with two borrow areas and recreational facilities to be constructed within CCWD watershed property lines. Under this alternative, the existing Transfer Station capacity would be expanded; however, this facility would not expand its footprint as would occur for other alternatives. Alternative 4 would exclude construction of any Delta Intake and Pump Station, Conveyance or Power Supply facilities, and would avoid ground disturbance in areas with hazardous materials. Alternative 4 involves a smaller project that would require less time to construct and cover an overall smaller footprint. However, as with Alternative 1, this alternative has the potential to expose people and structures to wildland fires. This impact would be significant.

Implementation of Mitigation Measure 4.13.3 would reduce the potential for wildfire risks to less-than-significant levels.

Mitigation Measures

Measure 4.13.3: CCWD will incorporate into contract specifications the requirement that the contractor enforce strict onsite BMPs to reduce the potential for accidental fires.

1) All equipment used during construction must have an approved spark arrestor.

2) The contractor/staff responsible for construction will submit a Fire Safety Plan for review by the Contra Costa County Fire Prevention Bureau. This plan will include precautions to carry out during high-fire danger, a list of fire-suppression equipment and tools to have on hand, a description of available communications, specifications for the supply of water to have on hand, and descriptions of other actions that will reduce the risk of ignition and facilitate immediate control of an incipient fire.

3) Ensuring easily accessible fire-suppression equipment is available at all work locations.

Impact Significance after Mitigation: Less than Significant.

Impact 4.13.4: Construction and operation of project power supply facilities would not locate electrical transmission facilities within 150 feet of a school. (No Impact)

Alternative 1

New transmission lines and other power facilities would be constructed as part of the Los Vaqueros Reservoir Expansion Project; therefore, EMF levels would increase and there would be some potential for increased exposure by people and the environment to EMF.

However, as indicated in Section 4.13.1, Affected Environment, there are no federal or state regulations governing EMF except near schools and no regulations have established environmental limits on the strengths of fields from powerlines. The State of California Department of Education regulations require minimum distances between a new school and the edge of a transmission line ROW. The setback distances are 150 feet from the edge of the transmission line ROW for 230-kV lines, which are the largest lines associated with the project. Since none of the project components would be within a quarter mile of an existing or proposed school, this criterion would be met and there would be no impacts related to EMF.

Alternative 2

Power Options 1 and 2 facilities and construction procedures that are included in Alternative 2 would be the same as those under Alternative 1. Impacts related to EMF would be no impact.

Alternative 3

Construction of Alternative 3 would include the same components and construction procedures as Alternative 1 except that the Old River Intake and Pump Station would be expanded and there would be no construction of the new Delta Intake and Pump Station or the Transfer-Bethany Pipeline. As with Alternative 1, no new facilities would be within 150 feet of an existing or proposed school. Impacts related to EMF would be no impact.

Alternative 4

Alternative 4 would involve a 160-TAF Reservoir Expansion/Dam Modification project with two borrow areas and multiple recreational facilities to be constructed within CCWD watershed property lines. Under Alternative 4, there would not be any new power supply facilities constructed and, therefore, there would be no impacts related to EMF.

Mitigation: None required.

Cumulative Effects

Impact 4.13.5: The project alternatives would not contribute to cumulative impacts associated with release of hazardous materials or other hazards. (Less than Significant)

Construction of the project under all alternatives would disturb subsurface soils and groundwater during site preparation and building of reservoir facilities, excavation for pipelines and other construction activities (Impact 4.13.1). If contaminated soils or hazardous substances were present in the disturbed areas, construction workers and the public could be exposed to these substances; however, there is no recorded indication that contaminated sites or hazardous substances are within areas to be disturbed. Therefore, there would be limited opportunity for the project alternatives to contribute to cumulative impacts associated with exposure to hazardous materials.

Most construction projects, like the proposed Los Vaqueros Reservoir Expansion project, would involve the storage, use, disposal, and transport of hazardous materials to varying degrees during construction and operation. Most potential hazards and hazardous materials impacts associated with the storage, use, disposal, and transport of materials are extensively regulated by various federal, state and local agencies. Accidental spill or contamination impacts (Impact 4.13.2) would be focused at individual facility locations and construction activities would be required to implement BMPs to keep hazardous materials from being accidentally released (Mitigation Measure 4.13.2).

In the same manner as other hazardous materials, use of flammable and combustible materials (such as internal combustion equipment) is extensively regulated by various federal, state and local agencies to reduce chances of starting wildland fires (Impact 4.13.3). Contract specifications that require the contractor to enforce strict onsite BMPs would be placed specifically at individual facility locations and construction activities to reduce the potential for accidental fires (Mitigation Measure 4.13.3).

As for the potential for the project alternatives to contribute to cumulative impacts associated with EMF (Impact 4.13.4), it is recognized by the CPUC that EMF fields from power supply facilities drop to near background levels in relatively short distances. Construction and operation of project power supply facilities would not locate electrical transmission facilities near any schools; therefore, there would be no opportunity for the project alternatives to contribute to cumulative impacts associated with exposure to EMF.

The proposed project would not make a cumulatively considerable contribution to any significant cumulative impact related to hazardous materials or public health due to the site-specific nature of the potential impacts and the required implementation of BMPs to avoid accidental hazardous material spills and wildland fires. Cumulative impacts would be less than significant.

Mitigation: None required.