CHAPTER 3
Description of Project Alternatives

3.1 Introduction

3.1.1 Chapter Overview

This chapter describes the alternatives for the proposed Los Vaqueros Reservoir Expansion Project, including the four action alternatives and the No Project/No Action Alternative. The four action alternatives are summarized in Section 3.1.2 and described in more detail in Section 3.4.

The chapter is organized as follows:

- Section 3.2 describes the process that was used to develop the action alternatives, the process that was used to screen the eight action alternatives that were developed, and the four alternatives that were eliminated from further evaluation.
- Section 3.3 provides a detailed description of the No Project/No Action Alternative.
- Section 3.4 provides a detailed description of the four action alternatives.
- Section 3.5 describes the proposed facilities under the four action alternatives in terms of location, site layout, and chief design and operational characteristics.
- Section 3.6 describes the construction activities that would occur in the Proposed Project (all four action alternatives).
- Section 3.7 describes the approvals and permits that would be required to implement the Proposed Project.

3.1.2 Summary of Action Alternatives Evaluated in This Draft EIS/EIR

This section contains a summary of the four action alternatives. The action alternatives represent different combinations of facility options and water system operations for expanding the Los Vaqueros Reservoir (reservoir), as well as associated water conveyance.

The facility options are distinguished by the amount of expansion of the reservoir capacity (i.e., from the existing 100 thousand acre-foot (TAF) to 160 TAF or to 275 TAF) and whether a new conveyance pipeline connecting the expanded reservoir to the South Bay water agencies via the State Water Project (SWP) Bethany Reservoir at the South Bay Pumping Plant (South Bay

Connection) is included in the project. The South Bay water agencies include Alameda County Flood Control and Water Conservation District, Zone 7 (Zone 7); Alameda County Water District (ACWD); and Santa Clara Valley Water District (SCVWD).

- **Expanded Reservoir Capacity.** Reservoir capacity is a key distinguishing factor because impacts to terrestrial habitat, including wetlands and other habitat for endangered and threatened species, are correlated with the size of the reservoir inundation. The smaller expansion (160 TAF) would require fewer and/or smaller facilities, which could avoid or reduce construction-related impacts on agriculture, traffic, and air quality. However, many of the benefits of an expanded reservoir capacity (e.g., environmental, emergency and dry-year storage, delivered water quality) are proportional to capacity; the larger capacity would result in greater benefits.

- **South Bay Connection.** The South Bay Connection is also a key distinguishing factor because, with such a connection, Los Vaqueros Reservoir system screened pumps could be used to divert SWP water for the South Bay water agencies and Central Valley Project (CVP) water for SCVWD. These agencies currently receive their SWP and CVP water through the CVP and SWP Delta export pumps, which have been subject to increasing regulatory restrictions to protect fish. Using the more effectively screened Los Vaqueros Reservoir system intakes in place of the SWP and CVP facilities is anticipated to greatly reduce the impact of this water delivery on Delta fish by reducing the mortality associated with the current salvage operation at the CVP and SWP Delta export pumps and allowing a pumping schedule that improves protection of aquatic species. An analysis of this effect is presented in Section 4.3. The South Bay Connection could also improve water supply reliability for the South Bay water agencies. On the other hand, eliminating the South Bay Connection could avoid or reduce construction-related impacts on agriculture, traffic, and air quality.

The two primary objectives for all of the action alternatives are to (1) develop water supplies for environmental water management (Environmental Water Management) and (2) increase water supply reliability for Bay Area water providers (Water Supply Reliability). The manner in which the alternatives operated would determine to what extent the primary objectives were achieved. A secondary objective for all of the action alternatives is to improve the quality of water deliveries to municipal and industrial customers in the San Francisco Bay Area without impairing the project's ability to meet the environmental and water supply reliability objective (Water Quality). See Chapter 1 for a discussion of project purpose, need, and objectives.

Assumptions regarding operations were chosen to bracket a range of potential operations and associated impacts. The adverse impacts of the actual water delivery operations selected for the project, if approved, are expected to fall within this range. The project benefits, on the other hand, could be greater than those identified in this Draft EIS/EIR because operation of any selected alternative would be adaptively managed to maximize project benefits without increasing adverse environmental impacts. The extent of the benefits achieved in each of these areas will depend on several factors, including future Delta conveyance and habitat improvements, Delta operations requirements, and the project's precise environmental water management actions as further developed in project permits and agreements with project partners.

There are various ways to operate the alternatives to achieve the project objectives. These operations are defined below. The operations are used in different combinations in the alternatives to yield different sets of benefits.

- **Environmental Water Management.** The project alternatives would result in varying degrees of improvement in environmental water management depending on the water system operations that were implemented. Depending on the alternative, operations to improve environmental water management would include:

  - Improved Fish Screening – The expanded reservoir system would only divert water through state-of-the-art positive barrier fish screens designed and operated to regulatory agency specifications. Shifting the pumping of SWP and CVP supplies for South Bay water agencies to the more effectively screened Los Vaqueros Reservoir system intakes would result in fewer impacts to fish than the same amount of water diverted from either the SWP or CVP export facilities. SWP and CVP Delta export pumping would be correspondingly reduced either concurrently or when fish species were better protected.

  - No-Diversion Period – Additional storage in the expanded reservoir would provide operational flexibility to reduce Delta diversions during the most sensitive fish period without disrupting supplies. Permits to operate the existing reservoir require a 30-day no-diversion period during the most critical spring fish period. Shifting the South Bay water agencies diversions to the expanded reservoir system would allow the extension of the no-diversion period to approximately three times the current amount, while still making the water deliveries to the participating agencies. Water demands during the no-diversion period would be met through storage releases from the expanded reservoir.

  - Multiple Delta Intake Locations – Water would be diverted to the expanded reservoir system through two or three separate Delta intakes depending on the alternative. Multiple points of diversion would provide flexibility to respond to changing fishery conditions in the Delta.

  - Dedicated Storage for Environmental Water – A portion of the additional storage capacity in the expanded reservoir would be dedicated to storage for environmental water supplies for Central Valley refuges, instream flows, and other environmental water needs.

- **Water Supply Reliability.** The project alternatives would result in varying levels of increase in water supply reliability. Depending on the alternative, operations to increase water supply reliability would include:

  - Delta Supply Restoration – The expanded reservoir system would be used to partially restore delivery reductions to the South Bay water agencies that have occurred and are expected to continue to occur due to regulatory restrictions at the SWP and CVP Delta export pumps.

  - Dry-Year Storage – Additional storage in the expanded reservoir would be used to meet dry-year needs for Contra Costa Water District (CCWD) and the South Bay water agencies. Subsequently, the need to purchase supplemental dry-year supplies, activate

dry-year exchange programs, or institute drought management measures would also be reduced. The expanded reservoir would allow more storage of water in wet periods for use in dry periods.

- Emergency Storage – Additional storage in the expanded reservoir would be available for delivery to Bay Area water agencies through the South Bay Connection or existing interties in the event of a levee failure, chemical spill, or other emergency.

The key distinguishing characteristics of the four action alternatives that are evaluated in this Draft EIS/EIR are shown in **Table 3-1**. Each action alternative is described in detail in Section 3.4. The No Project/No Action Alternative is described in Section 3.3.

TABLE 3-1
KEY DISTINGUISHING CHARACTERISTICS OF THE FOUR ACTION ALTERNATIVES

Key Characteristic	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Expanded Reservoir Capacity	275 TAF	275 TAF	275 TAF	160 TAF
New South Bay Connection?	Yes	Yes	No	No
Operational Emphasis	Environmental Water Management Water Supply Reliability	Environmental Water Management	Environmental Water Management	Water Supply Reliability
Key Operations	Improved Fish Screening No-Diversion Period Delta Supply Restoration Dry-Year and Emergency Storage	Improved Fish Screening No-Diversion Period Dedicated Storage for Environmental Water Dry-Year and Emergency Storage	No-Diversion Period Dedicated Storage for Environmental Water Dry-Year and Emergency Storage	No-Diversion Period Dry-Year and Emergency Storage

TAF = thousand-acre foot

All of the action alternatives assume that the expanded reservoir would operate to ensure that CCWD continued to receive the water quality and emergency storage benefits associated with the Los Vaqueros Reservoir.

Filling of the expanded reservoir would occur during periods of low salinity to maintain the water quality benefits of the existing reservoir. Filling would be subject to the no-diversion period described above.

Water Rights and Coordinated Operations

None of the alternatives would involve diverting more water from the Delta than allowed under existing water rights or changing the ownership or priority of those water rights. The project would change the timing and location of diversions such that fish protection, environmental water management, and Bay Area water supply reliability would improve. These changes may necessitate

modification of existing water right permits held by CCWD; U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region (Reclamation); and/or California Department of Water Resources (DWR).

In addition to its long-term contract with Reclamation, CCWD has separate water rights for the Los Vaqueros Reservoir. CCWD's separate Los Vaqueros water rights are subject to permit terms and conditions to ensure that exercising those water rights does not adversely affect the CVP and SWP operations under the water right permits held by Reclamation and DWR, respectively. Under all alternatives, the use of the collective water rights of the project participants would be coordinated to operate the existing and new facilities in a manner designed to accomplish the project objectives without adversely affecting CVP and SWP operations. This would be achieved through agreements among the parties and permit changes as necessary.

Fishery Protection Measures and Delta Operations

Operational restrictions imposed on the SWP and CVP to protect fishery resources are an important part of the background conditions in the Delta. There is, however, considerable uncertainty regarding both what the regulations will be and how they will be implemented from year to year. To capture the likely range of operations with fishery restrictions, both current and future, and the resulting SWP and CVP operations, two scenarios were simulated. The "moderate fishery restriction" scenario represents the least restrictive set of requirements that can be expected under current and future regulatory conditions. The "severe fishery restriction" scenario captures the most restrictive requirements that can be expected. Analyses using both the moderate and severe fishery restriction assumptions were used to bracket the range of background conditions that are likely to occur in any year and to evaluate the environmental effects of the project alternatives under this range of conditions. The assumptions used to estimate these restrictions are described in Appendix C-3.

If other restrictions are imposed in the future, they will be analyzed to determine whether they would result in change. If the analyses indicate a new or substantially more severe impact would occur, a supplemental environmental review under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) would be required prior to taking further actions.

3.2 Development and Screening of Alternatives

This section presents a summary of the alternatives development and screening process implemented to identify the action alternatives that were evaluated in this Draft EIS/EIR

3.2.1 NEPA and CEQA Requirements

NEPA and CEQA require consideration of a range of alternatives to a Proposed Action that could potentially attain most of the basic project objectives and accomplish the project purpose and need while avoiding or minimizing environmental impacts. The purpose of including alternatives in an

EIS/EIR is to offer a clear basis for choice by the decision makers and the public as to whether or how to proceed with the Proposed Action or project. An EIS/EIR must also consider the No Action (NEPA) and No Project (CEQA) alternative.

NEPA Requirements

According to NEPA regulations (40 CFR 1502.14, Alternatives Including the Proposed Action), the alternatives section of an EIS is required to provide a rigorous exploration and objective evaluation of all reasonable alternatives, including the "No Action Alternative." The discussion of alternatives must present the impacts of the alternatives in sufficient detail to permit a reasoned choice between the alternatives. For alternatives that are not carried forward for detailed study, the EIS must include a brief discussion of the basis for this decision (see Section 3.2.3 and Appendix B, Alternatives Development). NEPA requires substantial analysis of all the alternatives so that their comparative merits may be evaluated (40 CFR 1502.14[b]).

CEQA Requirements

CEQA requires that an EIR include a discussion of alternatives to the Proposed Project to enable an evaluation of whether there are other means of achieving the project's basic goals and objectives while avoiding or reducing the environmental effects of the project. Section 15126.6(b) of the CEQA Guidelines states that:

> … the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or could be more costly.

Pursuant to Section 15126(d) of the CEQA Guidelines, an EIR must describe and evaluate a reasonable range of alternatives that could potentially attain most of the basic project objectives and would avoid or substantially lessen any of the significant impacts of the Proposed Project. Section 15126.6(f) of the CEQA Guidelines provides guidance on the extent of the alternatives analysis required:

> The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision-making.

As described under Section 15126.6(d) of the CEQA Guidelines:

> The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in

addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

Section 15126.6(e)(1) of the CEQA Guidelines also requires analysis of a "No Project Alternative." The purpose of evaluating the No Project Alternative is to allow decision-makers to compare the potential consequences of the project with the consequences that would occur without implementation of the project.

3.2.2 Alternatives Screening

CCWD, Reclamation, and other interested agencies have worked together on an alternatives development and screening process to identify and evaluate actions that could meet the established project objectives. Appendix B, Alternatives Development, describes the alternatives development and screening process that led to the identification of the four action alternatives evaluated in this Draft EIS/EIR. The process is summarized below.

Initial Identification and Screening of Alternatives

The first step in developing alternatives was to identify and evaluate potential initial concepts that could address one or more project objectives. More than 30 initial concepts were identified and rated on a scale of high to low based on their relative ability to address the primary and secondary objectives of the project.

In most cases, the initial concepts that were rated as moderately or less-than-moderately addressing a project objective were deleted from further consideration, while concepts rated higher were retained. In addition to screening based on ability to meet one or more of the project objectives, concepts were eliminated based on engineering (including cost), environmental, political, and institutional constraints relative to other available options.

The results of the initial screening are presented in **Table 3-2**. Of the more than 30 initial concepts evaluated, seven were retained for further consideration. The seven concepts were packaged into eight project alternatives representing a range of project options combining various elements of the retained concepts and emphasizing the primary project objectives to different degrees. (See the *Initial Alternatives Information Report* (Reclamation, 2005) for additional information.) The eight alternatives are:

1. Raise Los Vaqueros Dam In-Place for Bay Area Water Supply Reliability
2. Enlarge Los Vaqueros Reservoir for Bay Area Water Supply Reliability
3. Construct Desalination Facilities and additional storage (Enlarge Los Vaqueros Reservoir) for Bay Area Water Supply Reliability
4. Enlarge Los Vaqueros Reservoir with South Bay Aqueduct (SBA) Intertie at Dyer Canal for Environmental Water Management

TABLE 3-2
INITIAL CONCEPTS TO MEET PROJECT OBJECTIVES

Initial Concept	Potential to Address Project Objective	Status and Rationale
Surface Water Storage		
Enlarge Los Vaqueros Reservoir to increase conservation storage space (300 to 500 TAF total storage)	High – Could provide up to 400 TAF of new local storage for water supply reliability, and has potential to contribute to other project planning objectives	Retained – Specifically authorized for study; could contribute to other project planning objectives
Raise Los Vaqueros Dam In-Place to increase conservation storage space (115 to 275 TAF total storage)	Moderate to High – Could provide up to 175 TAF of new local storage for water supply reliability; has potential to contribute to other project planning objectives	Retained – Raising in-place potentially less costly than new enlarged dam; smaller increment of storage; could contribute to other project planning objectives
Raise Calaveras Dam to increase conservation storage space	Low – Could provide up to 320 TAF of local storage, but would only benefit agencies with existing SFPUC contracts (ACWD and SCVWD)	Deleted – Low potential to provide regional supply reliability benefits in the Bay Area
Enlarge San Luis Reservoir to increase conservation storage space	Low – Could provide up to 200 TAF but would serve only one agency (SCVWD)	Deleted – High unit cost; low potential to contribute to increasing regional Bay Area water supply reliability
Raise Pacheco Dam to increase conservation storage space	Low – Could provide up to 120 TAF but would serve only one agency (SCVWD)	Deleted – High unit cost; low potential to contribute to increasing water supply reliability in the project study area; limited potential to support other objectives
Construct new conservation storage at Upper Lake Del Valle Dam site	Low – Could capture up to 15 TAF local runoff, but effectiveness would depend on expansion of the SBA by DWR	Deleted – Effectiveness would depend on actions by others; low potential to provide regional benefits; high unit cost compared with other concepts
Construct other local area storage facilities considered as alternatives to the original Los Vaqueros Project	Moderate – Various sites could provide small to moderate increase in local storage	Deleted – Major site acquisition issues; high likelihood of local opposition; high unit cost
Construct new conservation storage in Sacramento River/San Joaquin River watersheds	Low – Various sites could provide small to moderate storage outside the project study area	Deleted – Low potential to address project planning objectives; most promising sites evaluated by ongoing CALFED studies
Construct new conservation storage in the Sacramento-San Joaquin Delta	Low – Uncertainty regarding ability to provide water supply reliability benefits to the project study area	Deleted – Low potential to address project planning objectives; most promising sites evaluated by ongoing CALFED studies
Reservoir/System Reoperation		
Increase effective conservation storage space in existing Lake Del Valle Reservoir	Low – Small potential to provide water supply reliability benefits to project study area without affecting other reservoir functions	Deleted – Low potential to provide regional water supply reliability benefits; high unit cost compared with other concepts
Improve Delta export and conveyance capability through coordinated CVP and SWP operations	Low – Limited potential for additional reoperation benefits beyond current plans	Deleted – Joint Point of Diversion and other system efficiency improvement concepts are being actively pursued in other programs

TABLE 3-2 (Continued)
INITIAL CONCEPTS TO MEET PROJECT OBJECTIVES

Initial Concept	Potential to Address Project Objective	Status and Rationale
Groundwater Storage		
Develop additional groundwater banking in San Joaquin River watershed	Low – Existing banks have sufficient capacity to store unused contract supplies; uncertainty regarding ability to secure additional supplies for banking and withdrawal limitations	Deleted – Existing Bay Area programs sufficient to store unused contract water; limited available capacity in current and planned banks
Develop additional groundwater banking in Sacramento River watershed	Low – Significant physical limitations to banking in Sacramento River watershed	Deleted – Low likelihood of developing a reliable conjunctive-use program for Bay Area supplies in the Sacramento River basin due to significant physical, groundwater, and other related problems
Conveyance/System Modifications		
Increase Delta diversion capacity to Bay Area water agency facilities	Moderate – Increased export capacity could provide water supply reliability benefits, particularly in combination with storage	Retained – Additional Delta diversion capacity with enlarged capacity at existing site and/or new central Delta diversion likely to be effective when used in combination with reoperation and/or new storage
Construct intertie from SFPUC to the SBA	Low – Uncertainty regarding availability of Hetch Hetchy supplies and ability to provide regional benefits	Deleted – Low potential to contribute to overall water supply reliability conditions in the project study area; could be independently implemented; would have limited contribution to other project planning objectives
Expand use of Freeport Regional Water Project	Low – Little potential to improve water supply reliability because benefits would be limited to surplus project capacity during wet periods	Deleted – Very high capital and unit costs; benefits would be limited primarily to wet years
Increase Banks Pumping Plant capacity to greater than 8,500 cfs	Low – Limited potential to benefit water supply reliability in the project study area due to physical and regulatory constraints on increased exports	Deleted – Limited potential for increased water supply reliability in the project study area; limited potential to contribute to other project planning objectives
Construct an intertie from Los Vaqueros Reservoir to the SBA upstream from Dyer Canal	Moderate – Could provide water supply reliability benefits to the South Bay water agencies with reoperation or expansion of Los Vaqueros	Retained – New conveyance from Los Vaqueros Reservoir to the SBA would be an important component of any reservoir expansion action
Construct intertie from Los Vaqueros Reservoir to the SBA via Bethany Reservoir	Low – Although this measure could provide water supply reliability benefits to the South Bay water agencies similar to the previously described Dyer Canal intertie, it would be much more costly because of increased pumping from Bethany Reservoir	Deleted – An SBA intertie at Bethany Reservoir was deleted as a measure for water supply reliability due to estimated high operations and maintenance costs; Retained – As a measure for plans focused on developing supplies for environmental water management

TABLE 3-2 (Continued)
INITIAL CONCEPTS TO MEET PROJECT OBJECTIVES

Initial Concept	Potential to Address Project Objective	Status and Rationale
Source Water Treatment Improvement		
Implement treatment/supply of agricultural drainage water	Low – Uncertain ability to treat agricultural runoff to a quality standard acceptable to the public	Deleted – Very costly; low certainty of success; likely low acceptability by stakeholders and general public
Construct desalination facility	Moderate – Potential to provide base water supply but would require storage to provide dry-year water supply reliability benefits	Retained – Limited application as a dry-year supply; high unit cost; potential environmental impacts from treatment byproducts; potential to provide benefits in combination with storage
Demineralize poor quality groundwater	Low – Limited groundwater resources in the project study area suitable for additional development; highly localized benefits	Deleted – High implementation costs; limited application and benefits; potential for adverse impacts to groundwater resources
Water Use Efficiency		
Implement additional wastewater reclamation	Low – Could provide localized supply reliability benefits, limited by acceptable uses of recycled water	Deleted – Measure being actively pursued by other CALFED Programs and by individual agencies in the Bay Area
Implement additional demand management facilities	Low – Low potential to significantly address dry-year water supply reliability over and above existing/planned conservation programs	Deleted – Would not effectively address project planning objectives and constraints/criteria; features being actively pursued by other CALFED Programs and by individual agencies in the Bay Area[1]

KEY:
ACWD = Alameda County Water District
Bay Area = San Francisco Bay Area
CALFED = CALFED Bay-Delta Program
cfs = cubic foot (feet) per second
CVP = Central Valley Project
DWR = Department of Water Resources
SBA = South Bay Aqueduct
SCVWD = Santa Clara Valley Water District
SFPUC = San Francisco Public Utilities Commission
SWP = State Water Project
TAF = thousand acre-feet

[1] Ongoing conservation programs in Bay Area are included in the No Project/No Action Alternative

5. Enlarge Los Vaqueros Reservoir with SBA Intertie at Bethany Reservoir for Environmental Water Management

6. Enlarge Los Vaqueros Reservoir with SBA Intertie at Dyer Canal with Water Supply Reliability / Environmental Water Management dual emphasis

7. Enlarge Los Vaqueros Reservoir with SBA Intertie at Bethany Reservoir with Water Supply Reliability / Environmental Water Management dual emphasis

8. Enlarge Los Vaqueros Reservoir with SBA Intertie at Dyer Canal and operate to improve delivered water quality and also contribute to Water Supply Reliability and Environmental Water Management

Alternatives Analysis

Further studies were conducted on the eight alternatives, including analyses of simulated project operations and more detailed assessment of engineering, environmental, regulatory, and cost factors. The analyses resulted in the identification of four comprehensive project alternatives for further detailed evaluation in this Draft EIS/EIR.

As a result of additional engineering studies, the alternative based on raising the dam in place was modified. Initially, the raise-in-place concept resulted in a "mini" raise of up to 115 TAF total capacity. Subsequent engineering studies determined that it would be possible to raise the existing dam in-place to achieve a moderate reservoir expansion of up to 275 TAF total capacity. The moderate dam raise scenario offers substantial potential cost savings over the larger expansion alternative because portions of the existing dam structure and associated facilities could be preserved and reused as part of the enlarged reservoir system. An alternative with expansion of the reservoir to 275 TAF was added to the list and evaluated in the *Initial Economic Evaluation for Plan Formulation Report* (Reclamation, 2006). From that analysis, it was concluded that the moderate reservoir expansion concept was economically feasible and appeared to be more cost effective than the larger reservoir expansion option in meeting project objectives. Consequently, the expansion to 275 TAF is the largest reservoir expansion considered in this Draft EIS/EIR and is part of three action alternatives.

3.2.3 Alternatives Not Carried Forward

The following four alternatives were not carried forward from the alternatives plan phase for detailed study in this Draft EIS/EIR:

- Desalination with storage (enlarge Los Vaqueros Reservoir) for Bay Area Water Supply Reliability. This alternative was not advanced for further study primarily because of potential environmental issues related to energy use and disposal of brine. Additionally, it represented among the highest cost per unit of water supply developed under any of the plans considered.

- Enlarge Los Vaqueros Reservoir with SBA Intertie at Dyer Canal for Environmental Water Management. This alternative was not advanced for further study because it would be less effective at meeting the environmental water objective than the alternative including an intertie with Bethany Reservoir, which was advanced. In addition,

environmental assessment of this intertie alignment indicated that it had greater potential environmental impacts (primarily with respect to biological and cultural resources) than did the Bethany Reservoir conveyance alignment.

- Enlarge Los Vaqueros Reservoir with SBA Intertie at Dyer Canal with Water Supply Reliability / Environmental Water Management dual emphasis. As discussed for the previous alternative, this alternative also was not advanced for further study because the intertie with the SBA at Dyer Canal would be less effective at meeting the dual project objectives than the alternative including an intertie to Bethany Reservoir. This conveyance alignment also had greater potential environmental impacts than the Bethany Reservoir alternative, which was advanced for further analysis.

- Enlarge Los Vaqueros Reservoir with SBA Intertie at Dyer Canal and operate to improve delivered water quality and also contribute to Water Supply Reliability and Environmental Water Management. Similar to the two previous alternatives, this alternative also included a SBA intertie, which was not as effective in meeting the project objectives as is the Bethany Reservoir intertie advanced for further study and was not an environmentally superior alternative. In addition, this alternative represented among the highest cost per unit of water of the alternatives considered to address the combined project objectives.

3.2.4 Facilities Siting – Alternatives Screening

In addition to the development and screening of comprehensive project alternatives, a facilities siting process was also conducted. The purpose of the siting studies was to help define the alternatives, identify location constraints, outline the areas to be evaluated in the Draft EIS/EIR, and potentially avoid environmental impacts. Several of the key siting studies are summarized below.

New Delta Intake and Pump Station. Nine potential intake locations on Old and Middle Rivers in the vicinity of Victoria Island were evaluated in 2001–2002. Each intake location was evaluated for engineering, biological, cultural resources, and land use criteria. The purpose was to determine whether siting issues would drive the location of the intake and therefore influence the modeling for water quality effects. No compelling differences were found among the sites, allowing the water quality analysis, hydrologic modeling results, and fisheries analysis to establish the preferred locations.

Recreational Facilities. Recognizing that expansion of the Los Vaqueros Reservoir to any level would affect the existing recreational facilities including the Marina, picnic areas, fishing piers and trails, a study to identify relocation sites was conducted in 2003. Factors considered included slope, wind, biological constraints, cultural resources constraints, and access. Marina sites at both the southern and northern ends of the reservoir were identified, as were sites for relocation of fishing areas and picnic areas, a potential new eastside trail system, and possible addition of a new interpretive center. The results of the recreational studies are documented in the *Draft Recreation Evaluation Technical Memorandum Draft* (ESA, 2004).

Conveyance Facilities. The *Facilities Siting Report* (ESA, 2007) contains a description of the results of a multi-year, multi-discipline series of studies conducted to develop and evaluate alternative locations for the principal components of the water conveyance system for an

expanded reservoir of up to 500 TAF. The report documents a comprehensive and systematic approach taken for facility site identification, evaluation, and screening. Sites were reviewed for engineering, constructability, and environmental considerations.

A number of sources were used to complete the facilities siting analysis including published literature, recent aerial photographs, geology, soils, and slope stability maps, previous Los Vaqueros Reservoir Expansion Project reports and maps for the Los Vaqueros Watershed, and other publicly available databases such as the *East Contra Costa County Habitat Conservation Plan and Natural Communities Conservation Plan (HCP/NCCP)* (ECC HCPA, 2006) and previously recorded cultural resource sites from the Northwest Information Center. The analysis relied heavily on Geographic Information System (GIS) assessment to determine the range and magnitude of potential effects, to quantify siting results, and to illustrate various facility configurations. In October 2004, analysts visited or viewed all the facility alternatives that were accessible within the Los Vaqueros Watershed or visible from public roads. Facility sites and pipeline alignments were further refined to avoid or minimize environmental impacts or to improve conditions for construction.

To achieve a systematic approach to facility siting evaluation, siting criteria were developed for engineering, biological resources, cultural resources, and land use. The siting criteria within each category were posed as a series of questions, for which answers were categorized into high, medium, or low constraint based on a defined rating scale. At various stages, for each set of facilities, the Los Vaqueros Reservoir Expansion Project team met after completing the evaluation matrices and profiles to review the results. The relative advantages and disadvantages of each facility site or pipeline route alternative were discussed and recommendations made for further analysis.

In September 2006, upon further refinement of the operations modeling, preliminary engineering and cost estimates, it was determined that 275 TAF was the maximum reservoir size to be evaluated. Subsequently, facilities sizing and siting were refined to accommodate a smaller reservoir expansion project; however much of the analysis conducted in the *Facilities Siting Report* (ESA, 2007) remained relevant, and new recommendations to accommodate the smaller project were made. These recommendations included the following:

- New Delta Intake and Pump Station to be located along the western bank of Old River, about 1,000 feet south of the existing pump station or expansion of the existing Old River Pump Station and associated facilities could occur.
- Balancing Reservoir to be located at the existing Transfer Facility (rather than a new, separate site within the watershed, as previously proposed).
- Inlet-Outlet Pipeline to be located generally within the Kellogg Creek Valley; creek corridor including buffer zone to be avoided.
- Stockpile Area to be located at the northern end of the Kellogg Creek Valley, east of Walnut Boulevard in an upland field.
- Delta-Transfer and Transfer-LV Pipelines to be co-located with the existing Old River Pipeline and Transfer Pipeline easements, rather than in separate, new alignments.

- Transfer-Bethany Pipeline alignment to be located generally parallel to Vasco Road to the point where Armstrong Road turns south, following Armstrong Road to the terminus, heading southeast toward the Harvey O. Banks Pumping Plant and then westward to Bethany Reservoir; alignment adjusted to avoid wetlands and sensitive plant areas.

Based on the facilities siting analysis, the best apparent alternatives were identified to advance to the next step of analysis. The facility siting process supported a systematic approach to establishing a reduced set of feasible alternatives for detailed EIS/EIR analysis, which are designed to avoid and minimize adverse effects while meeting project objectives.

More reconnaissance surveys that were required to fully analyze certain facilities where full access was not previously available as well as to define access roads, spoil disposal areas, pipeline staging areas, and power facilities were conducted in 2007–2008. Based on these surveys, the proposed site of the new Delta Intake and Pump Station was relocated farther south to avoid potential maintenance issues associated with the accumulation of sediments in the channel at the original site. Additionally, two route options for the last 1.5-mile segment of the Transfer-Bethany Pipeline were sited, both of which avoid impacts to vernal pool fairy shrimp (*Branchinecta lynchi*) complexes and burrowing owl (*Athene cunicularia*).

3.3 No Project/No Action Alternative

Both NEPA and CEQA require analysis of an alternative scenario in which the Proposed Project is not implemented. NEPA calls this the No Action Alternative while CEQA refers to it as the No Project Alternative. Reclamation recommends several criteria for including proposed future actions within the No Action Alternative. To be included in the No Project/No Action Alternative, future actions should be (1) authorized, (2) approved through completion of NEPA, CEQA, and Endangered Species Act compliance processes, (3) funded, and (4) permitted.

Under the No Project/No Action Alternative, CCWD and Reclamation would not implement the Los Vaqueros Reservoir Expansion Project. CCWD would continue to operate and maintain its existing facilities to deliver reliable water supply to its customers and maximize delivered water quality consistent with environmental regulations and permit conditions. In the near-term, there would be no substantive operational changes implemented under the No Project/No Action Alternative.

To maintain supply reliability to its customers over time, CCWD would continue to implement actions identified in its *Future Water Supply Study* (CCWD, 1998), including acquisition of water transfers as needed to provide reliable dry-year water supply. (See Chapter 2, Project Background, for a discussion of CCWD's existing facilities and operations and its future plans.) No new emergency storage would be provided to CCWD or its customers.

Bay Area water agencies receiving water from the Delta via the SWP or the CVP would continue to pursue actions to improve water supply reliability under separate environmental impact review, in accordance with CEQA and NEPA, as appropriate. No new emergency storage would be provided at Los Vaqueros Reservoir for Bay Area water agencies.

No new pipeline connection to Bethany Reservoir would be constructed. The approved enlargement of the SBA now in progress would be completed, but no other changes to the SBA conveyance system would be included.

The No Project/No Action Alternative includes the projects identified in the CALFED Storage Program Common Assumptions/Common Modeling Package. Key projects assumed to be in place and operating in the future include the Delta Mendota Canal–California Aqueduct Intertie, permanent operable barriers in the south Delta and the Freeport Regional Water Project. A full list of Common Assumptions projects is included in Appendix C. The No Project/No Action Alternative does not include new projects to implement ongoing planning efforts, including the Bay Delta Conservation Plan and the San Joaquin River Restoration Plan. DWR and Reclamation are beginning studies on potential modifications to the existing water conveyance system through the Delta, but no specific project(s) can yet be considered a part of the No Project/No Action Alternative because environmental review is not complete, no project has been approved, and the project(s) are not included in the Common Assumptions project list.

No Environmental Water Management supplies would be provided, and no water would be provided to South Bay water agencies through positive-barrier screened intakes. South Bay water agencies would not be able to eliminate diversions for 30 days in the spring and receive supplies from an expanded Los Vaqueros Reservoir instead. No additional wildlife refuge water supplies would be available from Los Vaqueros Reservoir. If Reclamation decided to pursue additional refuge supplies, Reclamation would have to pursue other means, such as water transfers, to provide them. If additional fishery protection measures were found to be desirable, they would have to be provided by means other than through an expanded Los Vaqueros Reservoir.

3.4 Action Alternatives

3.4.1 Overview

This Draft EIS/EIR presents an evaluation of the four action alternatives that include different combinations of facility and water delivery options for expanding Los Vaqueros Reservoir as well as associated water conveyance. As explained in Section 3.1.1, the facility options differ in the amount of reservoir storage capacity (i.e., increasing the Los Vaqueros Reservoir to either 275 TAF or 160 TAF) and whether a South Bay Connection is constructed linking the Los Vaqueros Reservoir system to South Bay water agencies via Bethany Reservoir and the SBA. The water delivery operations differ as to the emphasis placed on the two primary project objectives: environmental water management and water supply reliability. (See Chapter 1 for a discussion of project purpose, need and objectives.)

The evaluation of benefits described in this report is intended to provide information for potential project participants and to provide a basis for evaluating potential environmental impacts. If the lead agencies decide to pursue the project following this environmental analysis, additional analyses of the extent of these benefits will be necessary for potential project partners, including

state and federal government agencies, to determine their level of interest and willingness to make a financial commitment to the Proposed Project.

Benefits referred to in this Draft EIS/EIR are not the same as benefits used to justify federal interest in a Federal Feasibility Report, rather benefits indicate that an effect is beneficial instead of detrimental to the environment.

Alternative 1 is considered the Proposed Project for purposes of CEQA and it is treated as the Proposed Action for purposes of NEPA. Alternative 1 includes the largest reservoir expansion and greatest extent of associated facilities considered in this Draft EIS/EIR and is designed to meet both of the primary project objectives. At the other end of the range, Alternative 4 represents the smallest reservoir expansion with the fewest new or expanded facilities. At this stage of planning and evaluation, none of the alternatives has been designated as the Preferred Alternative under NEPA or the Least Environmentally Damaging Practicable Alternative under Section 404(b)(1) of the federal Clean Water Act because related engineering, economic and financial feasibility analyses are not yet complete.

The project area location is the same for each of the four action alternatives. The Proposed Project is in southeastern Contra Costa County, California. A portion of the South Bay Connection would be constructed in Alameda County, California. **Figure 3-1** shows the project area location within the Bay Area region. **Figure 3-2** shows the project area location relative to CCWD's existing water system facilities and its service area.

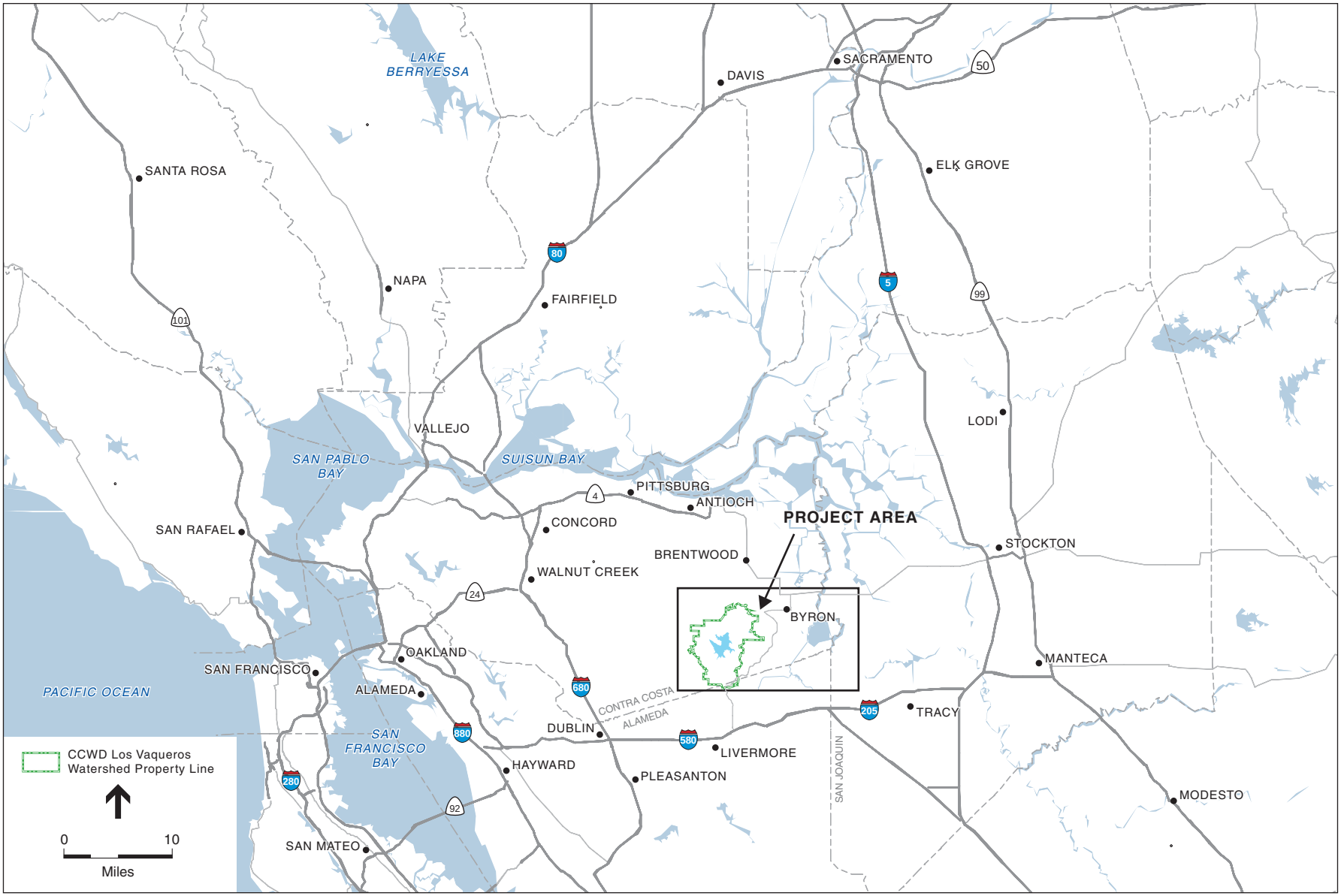
In addition to expansion of the Los Vaqueros Reservoir, each alternative would involve expansion of some of the other existing CCWD water system facilities along with construction of new facilities. **Figure 3-3** shows the project area in detail and highlights the existing water system facilities within the project area. The new and expanded facilities proposed under each of the four action alternatives would be integrated into the existing water system facilities shown on this figure.

See Section 2.1 for a description of CCWD's existing reservoir and related water system facilities. Existing facilities that would be integrated into the Los Vaqueros Reservoir Expansion Project are:

- Old River Intake and Pump Station — a 250 cubic feet per second (cfs) intake and pump station on Old River near State Route 4, equipped with a positive barrier fish screen that meets U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and California Department of Fish and Game (CDFG) screening criteria.

- Alternative Intake Project (AIP) — a 250-cfs intake and pump station on Victoria Canal, equipped with a positive barrier fish screen that meets USFWS, NMFS, and CDFG screening criteria. Water from the AIP is conveyed by pipeline to the Old River Pipeline at the Old River Pump Station; the AIP is currently under construction.

- Old River Pipeline — a 78-inch diameter, 320-cfs pipeline that conveys water from the Old River Pump Station to the Transfer Facility.

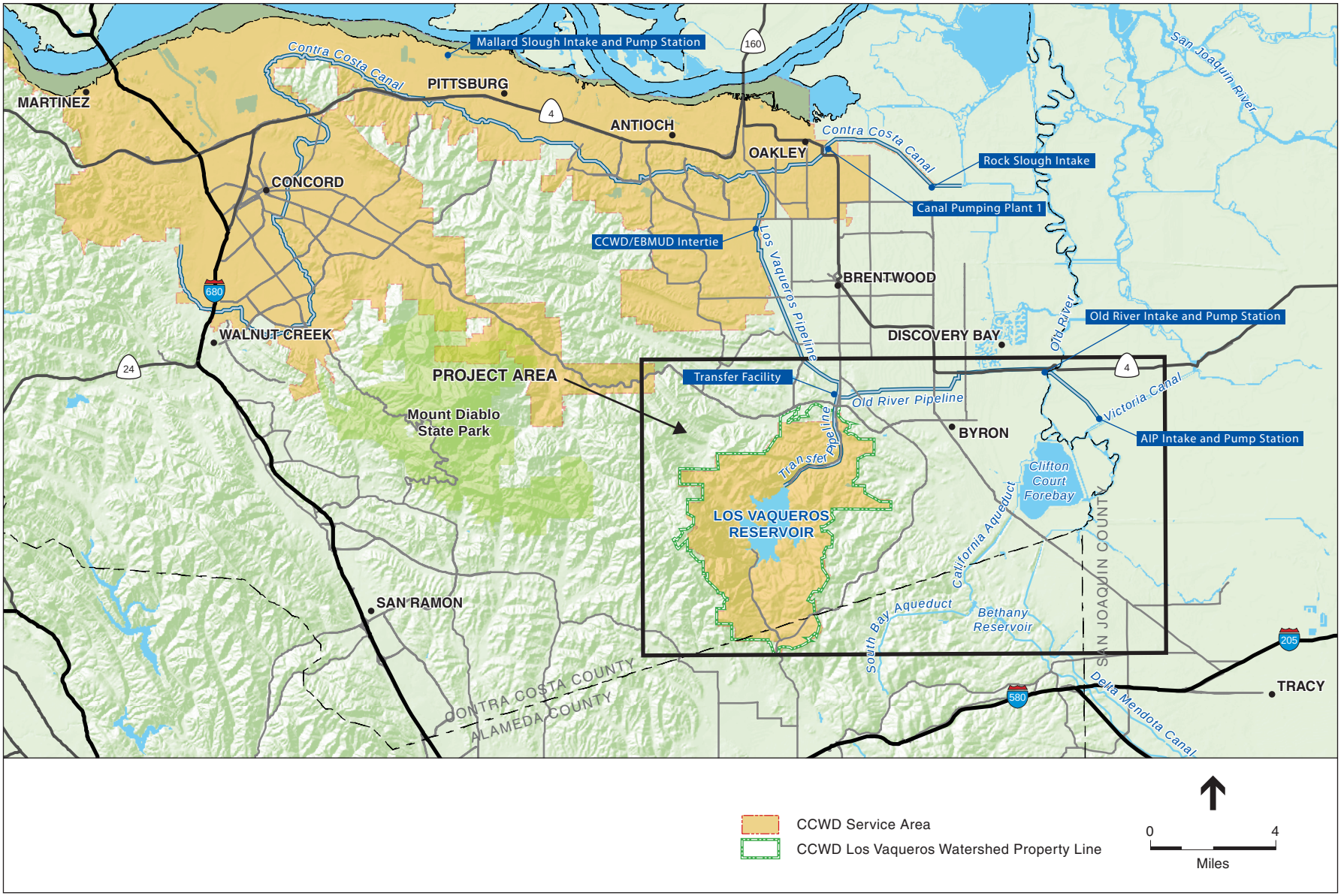


SOURCE: DeLorme Street Atlas USA, 2000; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-1

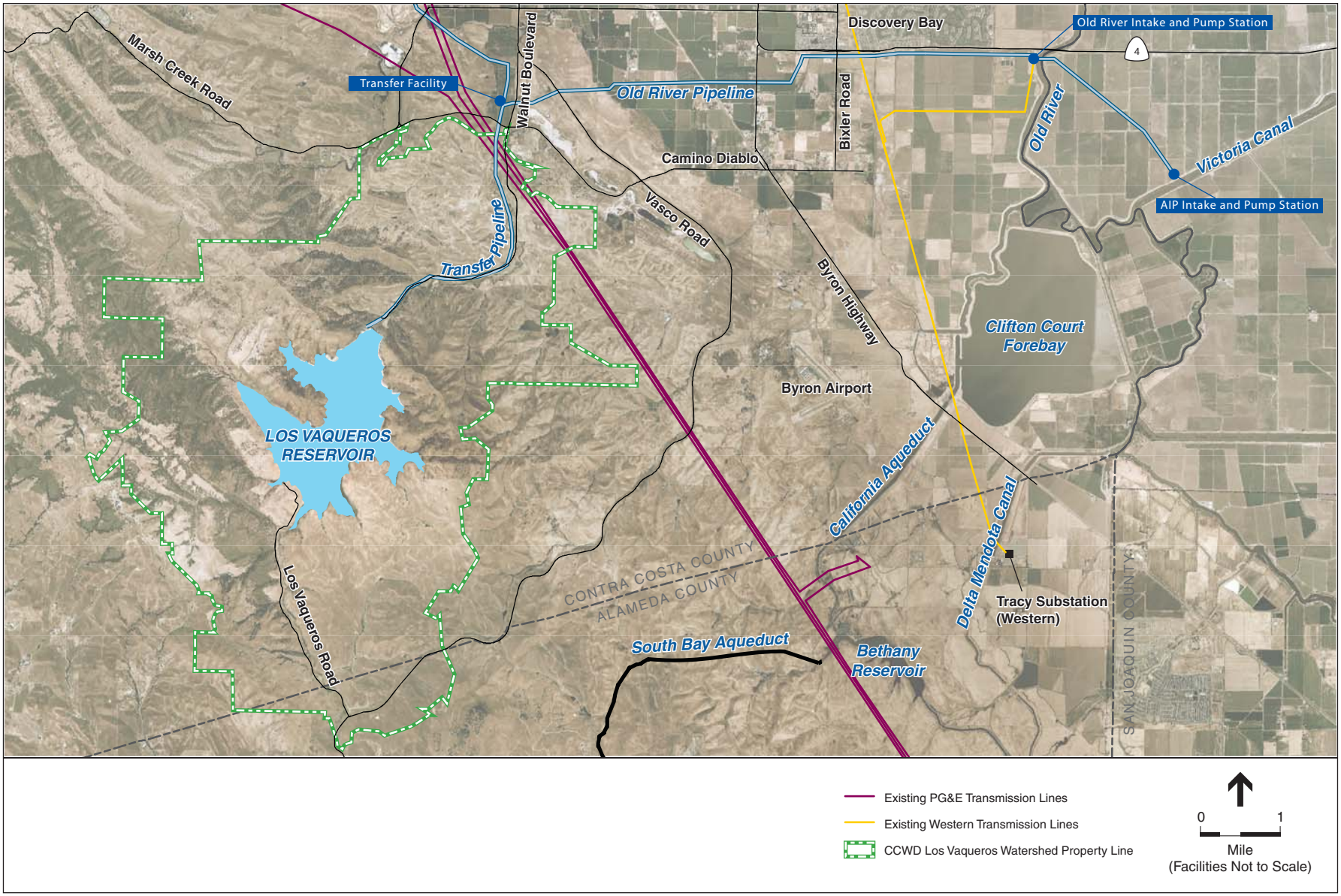
Regional Project Area Location



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

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-2
Project Area Location Relative to
CCWD Existing Water System Facilities



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

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-3

CCWD Existing Facilities in the Project Area

- Transfer Facility — the Los Vaqueros Reservoir system hub that regulates water into and out of the Los Vaqueros Reservoir and to the Contra Costa Canal via the Los Vaqueros Pipeline; key facilities include a 4 million gallon (MG) steel tank, a pump station to lift water to the reservoir, and a flow control station.

- Transfer Pipeline — a 72-inch diameter pipeline that conveys water from the Transfer Facility to the Los Vaqueros Reservoir at 200 cfs and carries up to 400 cfs in releases from the Los Vaqueros Reservoir to the Transfer Facility.

- Los Vaqueros Dam and Reservoir — a 100-TAF offstream storage reservoir impounded behind a 190-foot-high earthfill embankment dam; the existing dam can be raised to 282 feet to impound up to 275 TAF.

Under all alternatives, certain features of CCWD's existing operations would be integrated into the Los Vaqueros Reservoir Expansion Project. These include:

- Reservoir filling would occur during periods of low salinity to ensure that the project will continue to meet CCWD's water quality goals.

- Water for direct deliveries to CCWD would be diverted under CCWD's CVP water supply contract or as transfers such as CCWD's long-term agreement with the East Contra Costa Irrigation District.

- Water stored in Los Vaqueros Reservoir for CCWD purposes would be diverted under CCWD's Los Vaqueros water right permit or under CCWD's CVP water supply contract.

- No water would be diverted through the Los Vaqueros intake system from the Delta during a 30-day No-Diversion Period in the spring. This would provide substantial fishery protection by avoiding diversions during the most fish-sensitive period. It is assumed that other Delta operational restrictions would not affect reservoir filling and direct deliveries outside of the No-Diversion Period. The analysis presented in Section 4.3 and Appendix C demonstrates that operations under this assumption, in conjunction with the use of positive-barrier fish screens and water quality limits on reservoir filling, would not cause adverse impacts.

Under all alternatives, existing recreational facilities within the Los Vaqueros Watershed that are disturbed or displaced by the reservoir expansion project would be relocated or replaced. For Alternatives 1, 2, and 3, additional electrical power supply would need to be extended to proposed project facilities from the existing Western Area Power Administration (Western) and/or Pacific Gas and Electric (PG&E) power utilities that serve existing CCWD facilities.

The four action alternatives are described in the following sections with respect to proposed facilities and operational emphasis. **Table 3-3** summarizes the existing and proposed facilities (expanded and new) including the key facility characteristics (size and capacity) for the four alternatives. Detailed information about the proposed facilities is provided in Section 3.5, including site location, layout, relevant facility design, operation, and maintenance.

TABLE 3-3
MAJOR FACILITY COMPONENTS OF ALTERNATIVES

Component	No Project / No Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Reservoir Facilities					
Los Vaqueros Reservoir – Storage Capacity	100 TAF	275 TAF	275 TAF	275 TAF	160 TAF
Dam Raise	NA	Yes	Yes	Yes	Yes
Maximum Water Surface Elevation	**472 ft**	**560 ft**	**560 ft**	**560 ft**	**510 ft**
Intake Facilities					
Old River Intake and Pump Station (*existing facility; expanded under Alternative 3 only*)	250 cfs	250 cfs	250 cfs	320 cfs	250 cfs
Delta Intake and Pump Station (*new facility*)	NA	Up to 170 cfs	Up to 170 cfs	NA	NA
AIP (*existing facility*)	250 cfs	250 cfs	250 cfs	250 cfs	250 cfs
Conveyance Pipelines and Facilities					
Old River Pipeline (*existing facility*)	320 cfs	320 cfs	320 cfs	320 cfs	320 cfs
Delta-Transfer Pipeline (*new facility*)	NA	350 cfs	350 cfs	250 cfs	NA
Total conveyance capacity from the Delta	**320 cfs**	**670 cfs**	**670 cfs**	**570 cfs**	**320 cfs**
Transfer Facility (pumping / storage tank capacities) (*existing facility; upgraded under Alternatives 1-4; expanded under Alternatives 1 and 2*)	200 cfs /4 MG	670 cfs/12 MG	670 cfs/12 MG	570 cfs/12MG	200 cfs/4 MG
Transfer Pipeline (*existing facility*)	200 cfs to LV Res. and 400 cfs from LV Res. to CC Canal via LV Pipeline	400 cfs from LV Res. to CC Canal via LV Pipeline	400 cfs from LV Res. to CC Canal via LV Pipeline	400 cfs from LV Res. to CC Canal via LV Pipeline	200 cfs to LV Res. & 400 cfs from LV Res. to CC Canal via LV Pipeline
Transfer-LV Pipeline (*new facility*)	NA	670 cfs to LV Res. and 470 cfs from LV Res. to Bethany Res. via Transfer-Bethany Pipeline	670 cfs to LV Res. and 470 cfs from LV Res. to Bethany Res. via Transfer-Bethany Pipeline	570 cfs to LV Res.	NA
Transfer-Bethany Pipeline (*new facility*)	NA	470 cfs	470 cfs	NA	NA
Electrical Power Facilities (Two Options)					
Option 1: Extend new supply facilities from and upgrades to existing Western facilities *OR* Option 2: Extend new supply facilities from and upgrades to existing Western and PG&E facilities	NA	Needed	Needed	Needed	NA

cfs = cubic feet per second; CC = Contra Costa; ft = feet; LV Res = Los Vaqueros Reservoir; MG = million gallons; NA = not applicable; PG&E = Pacific Gas & Electric; TAF = thousand acre-feet

3.4.2 Alternative 1: Expanded 275-TAF Reservoir, South Bay Connection, Environmental Water Management and Water Supply Reliability Dual Emphasis

Alternative 1 is the largest reservoir expansion considered of the four action alternatives, has the greatest extent of associated facilities, and would be operated to meet both of the primary project objectives. Under this alternative, the reservoir would be expanded from the existing storage capacity of 100 TAF to 275 TAF. A new Delta Intake and Pump Station as well as new conveyance facilities to move water from the Delta to the Los Vaqueros Reservoir would be constructed. The South Bay Connection would be constructed linking the Los Vaqueros Reservoir system to South Bay water agencies via Bethany Reservoir and the SBA. New power facilities would be constructed to serve the new intake and other expanded Los Vaqueros Reservoir system facilities. Recreational facilities affected by the increased inundation area would be relocated or replaced.

Proposed Facilities

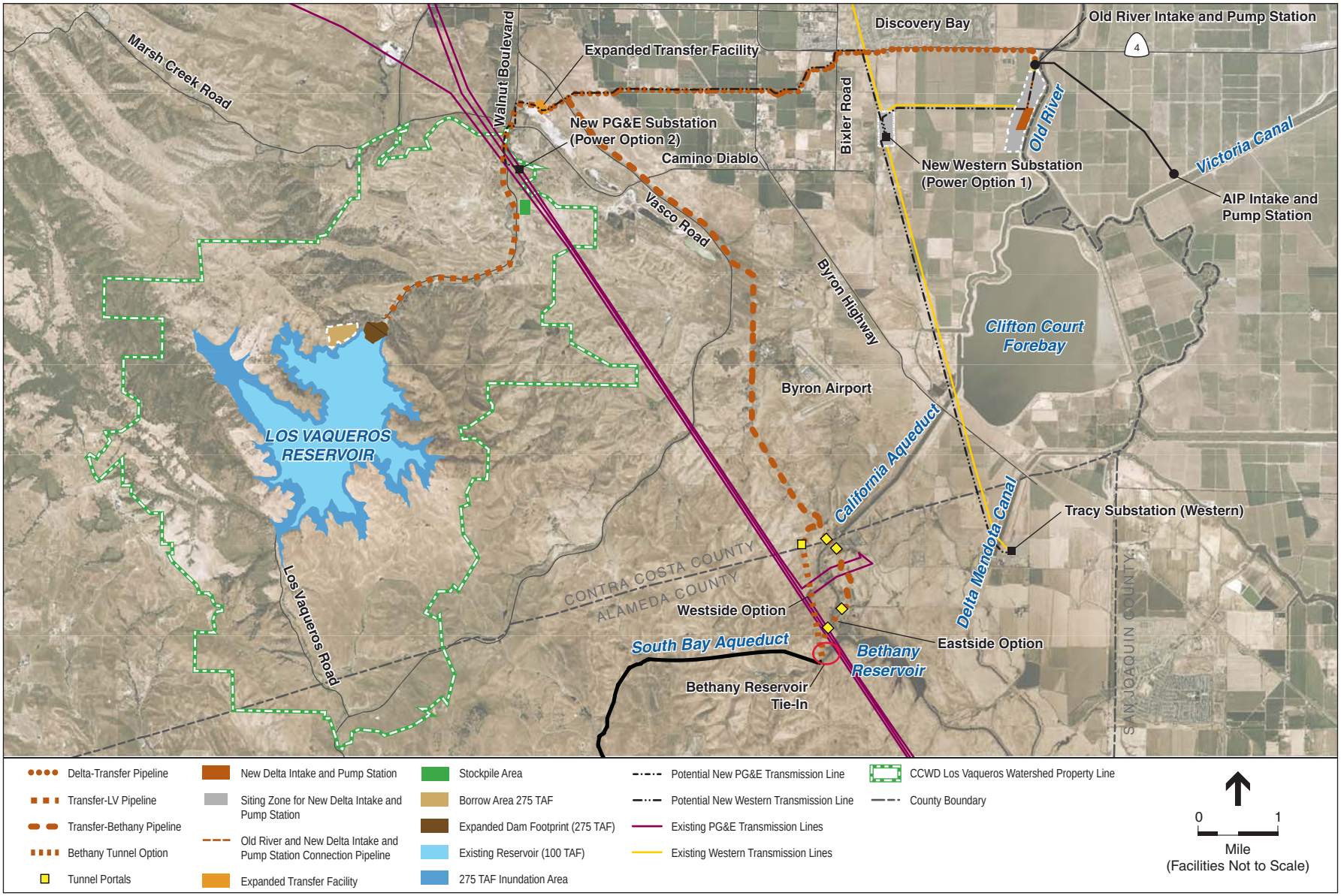
Figure 3-4 shows the facilities proposed under Alternative 1 and Table 3-3 summarizes the proposed facilities and their capacities. Under this alternative, the Los Vaqueros Reservoir would be expanded from the existing storage capacity of 100 TAF to 275 TAF. This would involve raising the existing dam, essentially building over the existing dam facility to raise and strengthen it to support the larger reservoir. **Figure 3-5** shows the reservoir inundation area for the 275-TAF reservoir compared to the Los Vaqueros Reservoir. The reservoir water surface area would increase from about 1,500 acres to about 2,500 acres.

Total diversion capacity under this alternative would be up to 670 cfs. Of this total diversion capacity, 500 cfs would come from the existing Old River Intake and Pump Station (250 cfs) and AIP (250 cfs), and the remaining capacity would come from a new 170-cfs Delta Intake and Pump Station. Under Alternative 1, the existing operating permits would be modified to allow combined diversions from all three intakes of the full 670 cfs capacity. This would not allow more water to be diverted from the Delta than would be allowed under existing water right permits, but it would change the location from where the water is diverted and some of the restrictions on the Los Vaqueros system intakes.

The new Delta Intake and Pump Station would be constructed along the Old River channel south of the existing intake structure on an approximately 22-acre parcel within the siting zone shown on Figure 3-4. Additional engineering and geotechnical investigations are required to select the final site location.

The capacity of the existing conveyance facilities that move water from the Delta to the Los Vaqueros Reservoir would also be expanded by the following means:

- Installing an additional pipeline parallel to the existing pipeline that extends from the Delta to the Transfer Facility and then from the Transfer Facility to the reservoir; and
- Adding expanded facilities at the existing Transfer Facility site (which currently includes a pump station, surge tanks, regulating reservoir and flow control station).

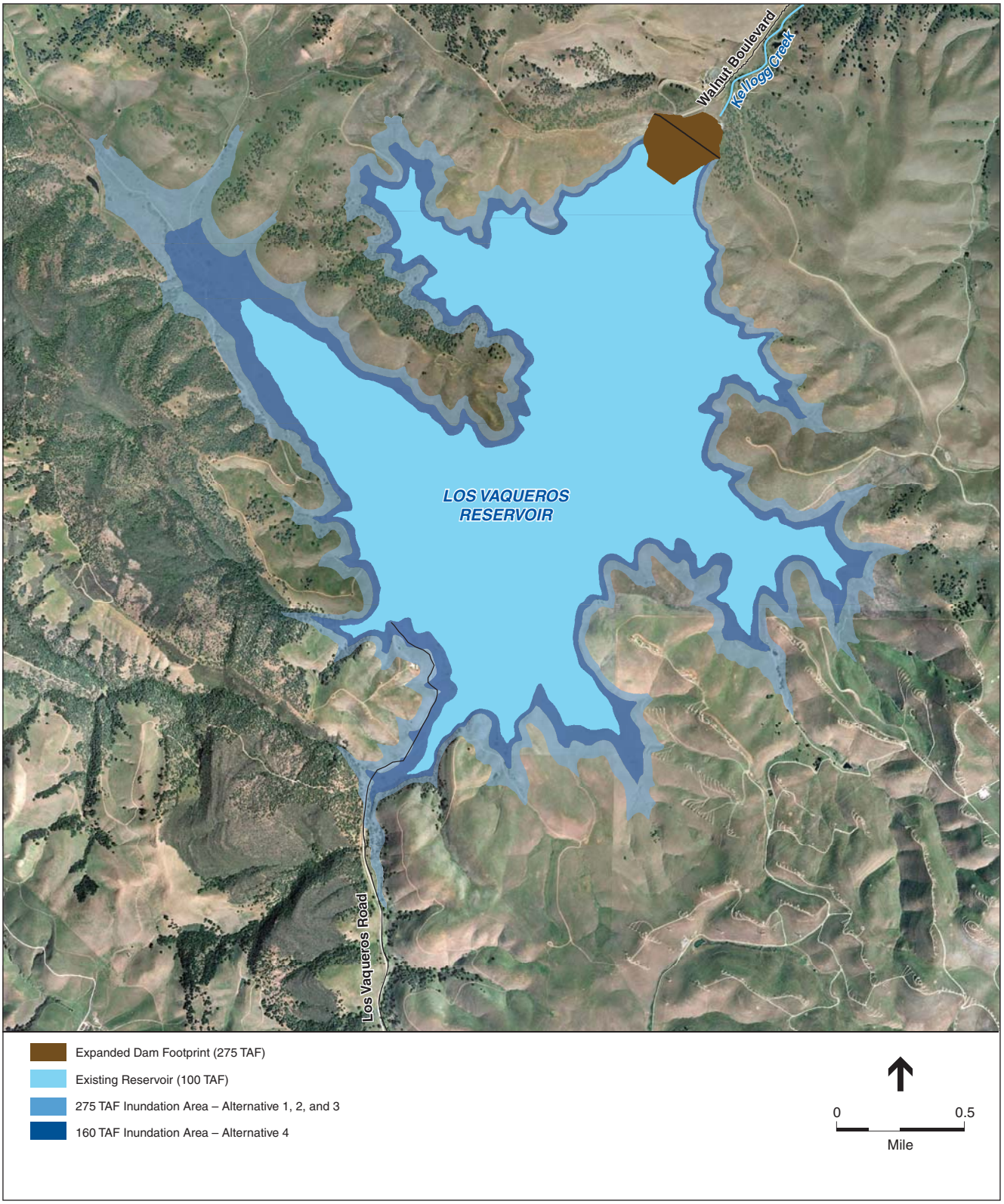


SOURCE: USGS, 1993 (base map); and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-4

Proposed Facilities – Alternatives 1 and 2



SOURCE: GlobeXplorer, 2007; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-5

Reservoir Expansion – Inundation Area

The proposed new Delta-Transfer Pipeline would have a capacity of up to 350 cfs and would be installed generally parallel to the existing Old River Pipeline between the intake facilities and the Transfer Facility. With the addition of the second pipeline, total conveyance capacity between the Delta intake facilities and the Transfer Facility would be up to 670 cfs. Similarly, an adjoining pipeline, referred to as the Transfer-LV Pipeline, would be installed parallel to the existing Transfer Pipeline between the Transfer Facility and the Los Vaqueros Reservoir. The Transfer-LV Pipeline would be used to fill the expanded reservoir at a rate of up to 670 cfs and to release water from the Los Vaqueros Reservoir to Bethany Reservoir via the Transfer-Bethany Pipeline (described below) at a rate of up to 470 cfs. The existing Transfer Pipeline would be used to convey release flows to the Contra Costa Canal via the Los Vaqueros Pipeline at up to 400 cfs.

The existing Transfer Facility would be expanded to accommodate movement of the higher flow volumes into and out of the expanded reservoir, and into the Transfer-Bethany Pipeline. As shown on Table 3-3, with the proposed expansion of the Transfer Facility, the total pumping capacity would be 670 cfs and Transfer Facility storage capacity would be 12 MG. The additional facilities would be next to the existing facilities at this site. In addition, an energy recovery system would be installed at the Transfer Facility to capture the hydraulic energy generated by the water delivered by gravity from the reservoir to the Transfer-Bethany Pipeline.

A key component of this alternative is the South Bay Connection, which consists of the Transfer-Bethany pipeline and appurtenant facilities extending between the Transfer Facility and Bethany Reservoir. The point of delivery would be near the South Bay Pumping Plant. From the point of delivery, the water would either be pumped into the SBA for use by the South Bay water agencies or moved to San Luis Reservoir for use by SCVWD as federal CVP water supply. No new or modified facilities are needed to move water beyond the point of delivery. The new Transfer-Bethany Pipeline would have a capacity of up to 470 cfs; the final capacity requirements will be determined during project design.

Additional and/or new power supplies would be required at the new Delta Intake and Pump Station and Expanded Transfer Facility. Power could be supplied via either of two options: Power Option 1: Western Only would extend new supply facilities from and construct upgrades to existing Western facilities; or Power Option 2: Western & PG&E would extend new supply facilities from and construct upgrades to existing Western and PG&E facilities. The power options are described in detail in Section 3.5.4.

Existing recreational facilities within the Los Vaqueros Watershed that are disturbed or displaced by the reservoir expansion would be relocated or replaced. Alternative 1 also includes construction of additional recreational facilities as described in detail in Section 3.5.5.

Operations

The water system operations that were assumed for this alternative were designed with a dual emphasis on both primary objectives, using an expanded Los Vaqueros Reservoir to improve Environmental Water Management and increase Water Supply Reliability for the Bay Area. Operations were adjusted through an iterative analytical process (described in Appendix C) to

meet the project objectives while minimizing impacts and avoiding harm to other water users. Alternative 1 would also meet the secondary objective of water quality improvement. Environmental Water Management, Water Supply Reliability, and Water Quality benefits are quantified and presented in Section 4.2, Delta Hydrology and Water Quality. This alternative assumes 20 TAF of the expansion is reserved for CCWD.

Operations would be coordinated with SWP and CVP operations as generally described in Section 3.1.2, Water Rights and Coordinated Operations. It is anticipated that water for South Bay water agency use would be diverted under existing CVP and SWP water right permits, modified as needed.

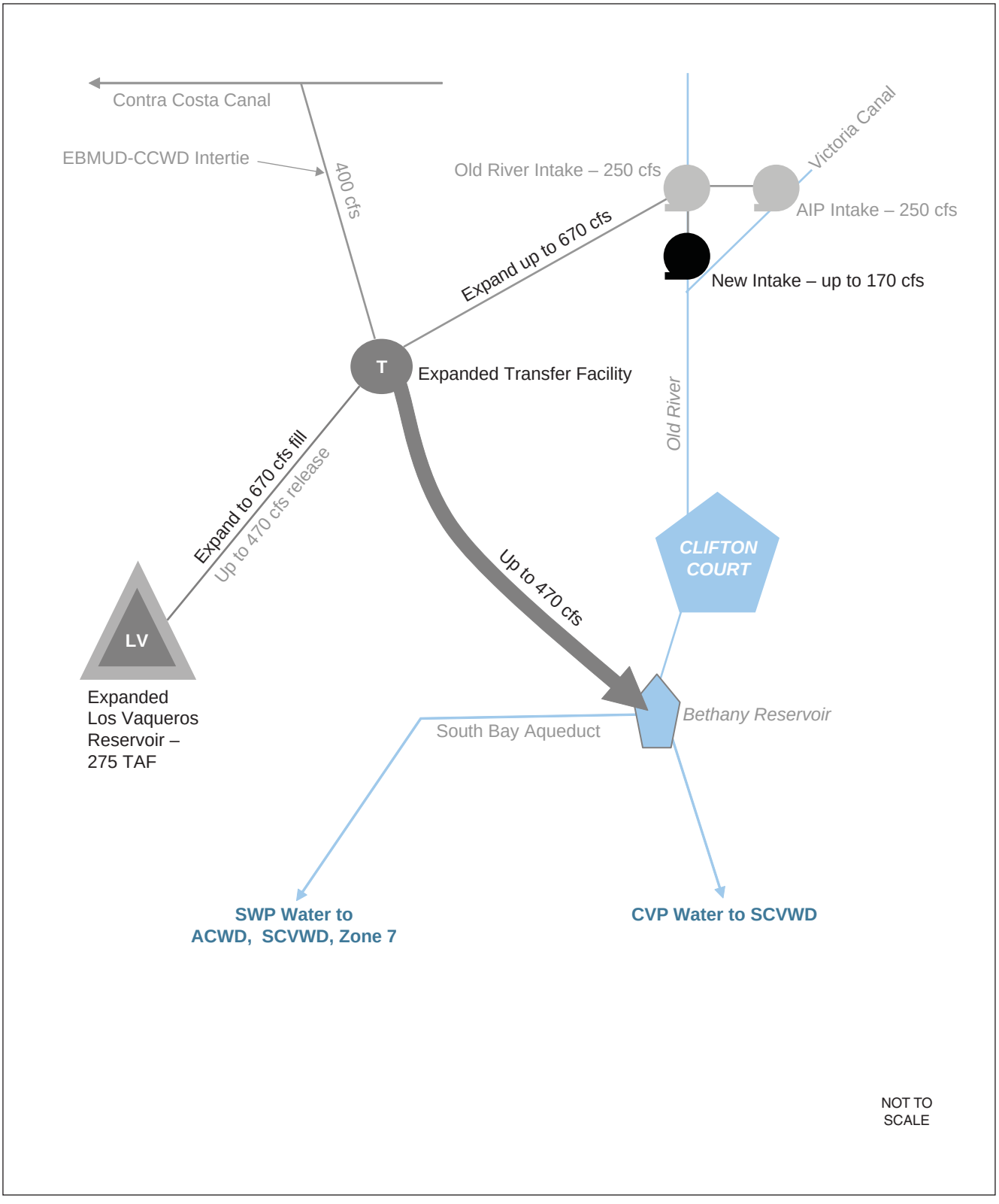
Figure 3-6 is a schematic that shows how water would be delivered under Alternative 1.

Environmental Water Management

Under Alternative 1, operations to improve Environmental Water Management would include Improved Fish Screening, the No-Diversion Period, and Multiple Delta Intake Locations.

With **Improved Fish Screening**, a major portion of the contracted SWP and CVP water delivered to the South Bay water agencies would be provided through the expanded Los Vaqueros Reservoir system, using state-of-the-art, positive-barrier fish screens, which protect fish more effectively than the existing CVP and SWP Delta export pumping systems. CVP and SWP Delta pumping would be reduced to correspond with the use of the Los Vaqueros Reservoir pumping system for these agencies. In the modeling used in this Draft EIS/EIR to simulate Delta water conditions and fish impacts, this reduction was assumed to take place at the same time as the shift to Los Vaqueros Reservoir system intakes, but the timing of the reduction could be adaptively managed to increase benefits for fish. For example, if reductions in SWP and CVP Delta export pumping were consolidated, the export pumps could be operated at minimal levels for a period of time in April to improve salmon migration or to allow delta smelt larvae to move out of the south Delta, or they could be operated at minimal levels for a period of time in February to allow longfin smelt (*Spirinchus thaleichthys*) larvae to move out of the south Delta. Whether or not timing of reductions is shifted to further increase benefits for fish, this alternative is expected to further the Environmental Water Management objective by reducing the mortality of Delta fish associated with the current salvage operation at the CVP and SWP Delta pumps. Improved fish screening would result in a long-term annual average of about 205 TAF per year of water managed for environmental improvement under Alternative 1, assuming moderate fishery restrictions.

With the **No-Diversion Period**, a portion of the additional storage capacity in an expanded Los Vaqueros Reservoir would be used to replace Delta pumping for the South Bay water agencies and CCWD for 30 days during the most critical fish period in the spring, furthering Environmental Water Management objectives. The timing of the No-Diversion Period would be adaptively managed to create the most benefit for fish.



SOURCE: CCWD, 2008; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-6
Alternative 1 Schematic –
275 TAF Reservoir with South Bay Connection

Additional fish protection would result from implementation of Alternative 1 because of the availability of **Multiple Delta Intake Locations**. Under Alternative 1, a new Delta Intake and Pump Station would be constructed and could be adaptively managed with the existing Old River Intake and Pump Station and the intake on Victoria Canal currently under construction (AIP) to adjust pumping locations to reduce impacts on fish. Coupled with the additional storage capacity of Alternative 1, Multiple Delta Intake Locations would enable coordination with CVP and SWP operations and pumping facilities to improve flexibility to respond to changing fishery conditions in the Delta.

Water Supply Reliability

Under Alternative 1, operations to increase Water Supply Reliability would include Delta Supply Restoration, Dry-Year Storage, and Emergency Storage.

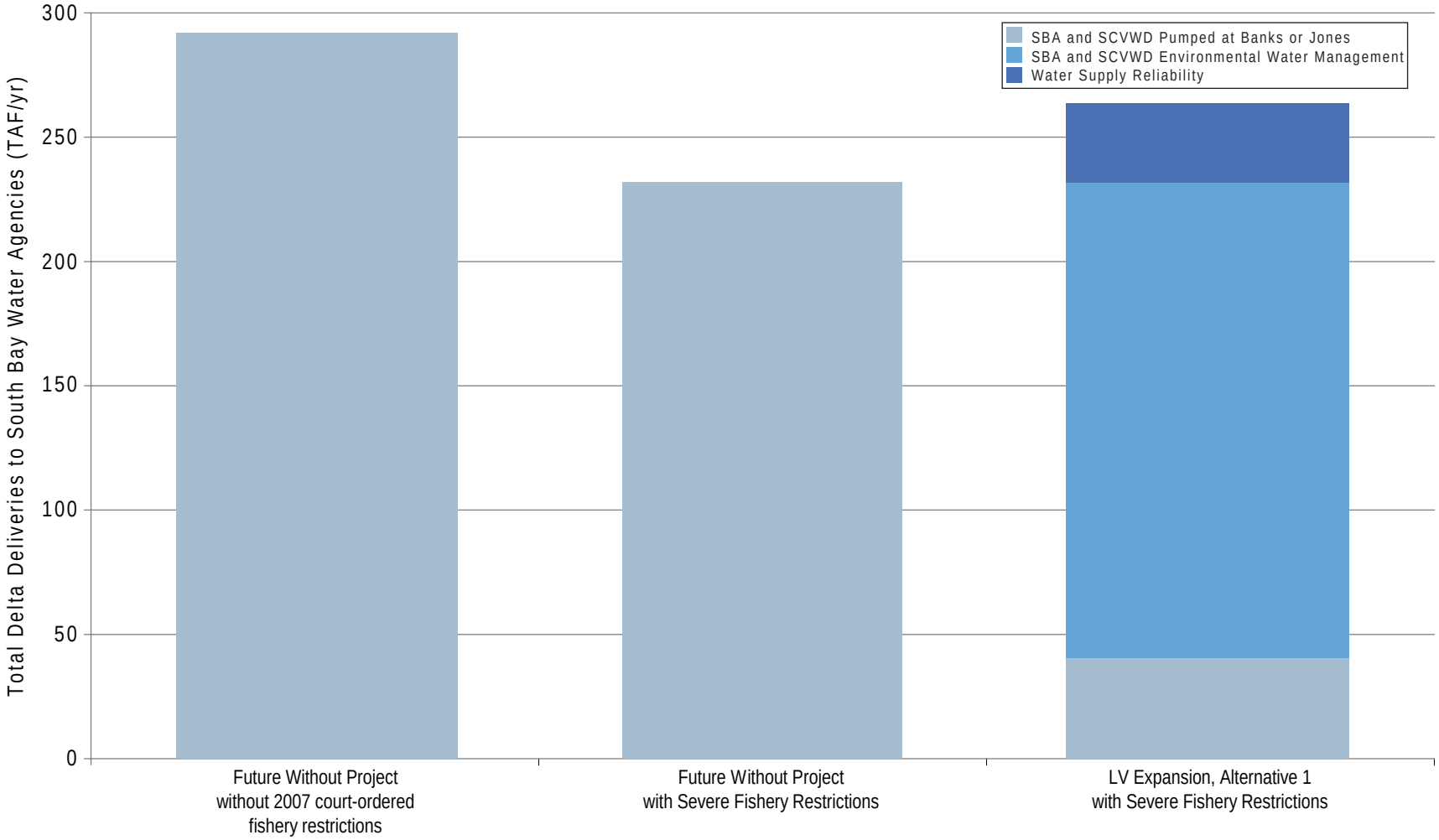
With **Delta Supply Restoration**, direct diversions and stored water supplies would be used to partially restore delivery reductions to the South Bay water agencies that have occurred and are expected to continue to occur due to regulatory restrictions at the SWP and CVP Delta export pumps. **Figure 3-7** illustrates this relationship. This analysis is further discussed in Section 4.2.

In addition, the Improved Fish Screening previously described could increase reliability for the South Bay water agencies by making the deliveries less subject to the short-term interruptions associated with regulatory restrictions on the SWP and CVP Delta export pumps. This type of interruption is not captured in the analysis performed for this Draft EIS/EIR but has been experienced at the SWP and CVP export pumps in recent years. These regulatory restrictions are not expected to apply to the Los Vaqueros Reservoir system diversions because of their effective screens.

Operating the expanded Los Vaqueros Reservoir for **Dry-Year Storage** would increase the amount of water available in dry years to South Bay water agencies and CCWD, reducing the need to purchase supplemental dry-year supplies, activate dry-year exchange programs or institute drought management measures. The amount of Dry-Year Storage available to the South Bay water agencies is integrated with the supply available for Delta Supply Restoration and is not quantified separately.

Assuming moderate fishery restrictions, Delta Supply Restoration and Dry-Year Storage would provide a long-term annual average benefit of 20 TAF for the South Bay water agencies. This annual average reliability benefit is 30 TAF in a 6-year drought. Figure 3-7 shows reliability benefits to the South Bay water agencies from Alternative 1, assuming severe fishery restrictions. Operating Alternative 1 for Dry-Year Storage would increase the amount of good quality water available to CCWD from Los Vaqueros Reservoir in dry years by up to 20 TAF at the start of a drought.

Emergency Storage available to the Bay Area region under Alternative 1 is about 225 TAF. This stored water would be available during shortages caused by natural disasters or other emergencies. Emergency water supplies would be delivered through either the South Bay Connection or existing interties between water agencies.



SOURCE: CCWD, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-7
Water Supply Reliability
(2030 Level of Development)

Water Quality

This alternative is also expected to result in minor improvements in the quality of water delivered to South Bay water agencies by providing higher quality water from the reservoir instead of the Delta during dry periods and reducing deliveries of water through Clifton Court Forebay where warm, shallow, slow-moving water often results in algae growth and a resulting increase in organic carbon content and taste and odor issues. Additional storage would also provide water quality improvements for CCWD in dry years by increasing the amount of water available for blending.

3.4.3 Alternative 2: Expanded 275-TAF Reservoir, South Bay Connection, Environmental Water Management Emphasis

Proposed Facilities

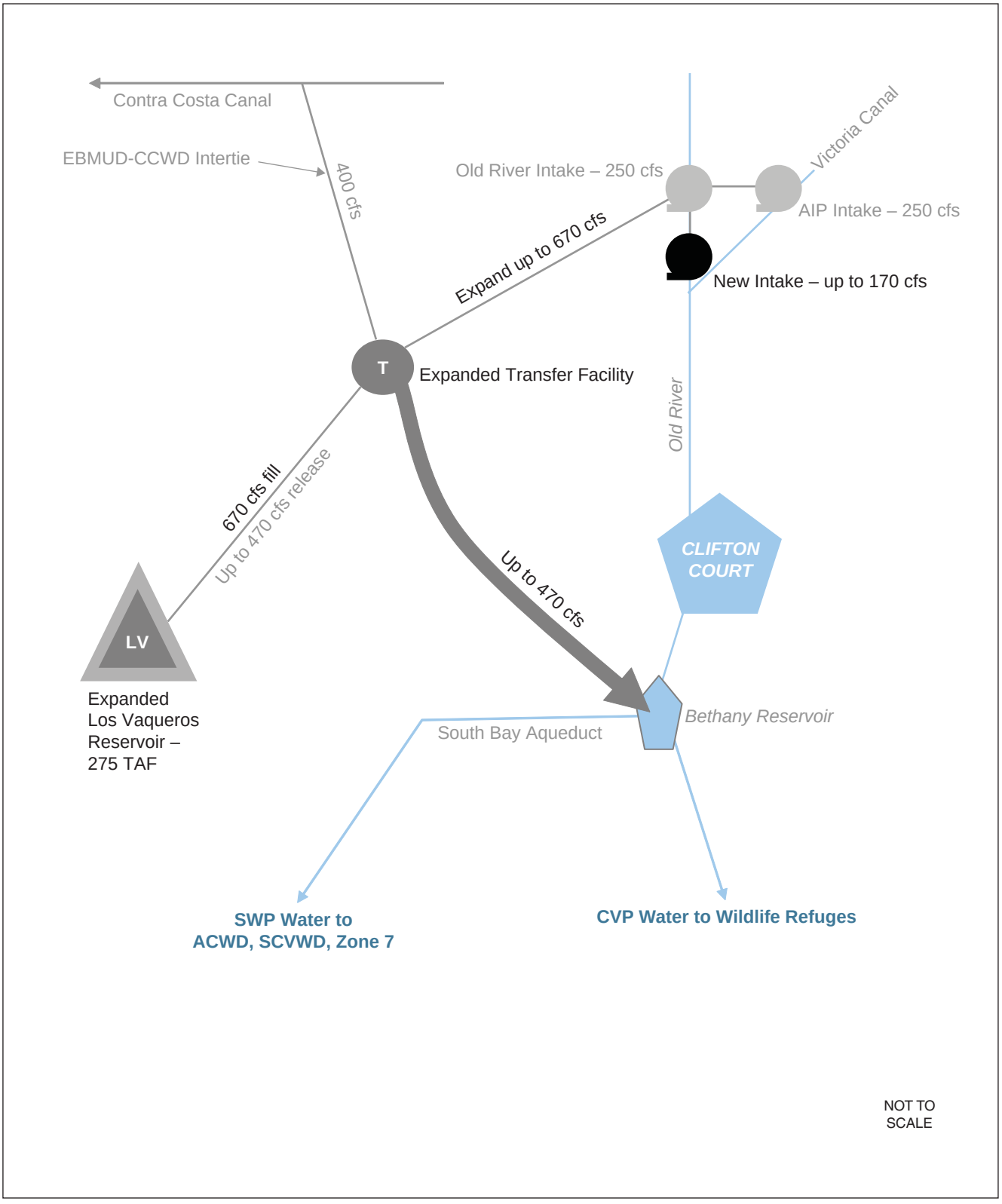
Under Alternative 2, new and expanded facilities to increase the storage capacity of Los Vaqueros Reservoir and connect to the South Bay water agencies would be the same as those described for Alternative 1. Alternative 2 is distinct from Alternative 1 in the water system operations evaluated. Figure 3-4 shows the facilities proposed under Alternative 2, and Table 3-3 summarizes the proposed facilities and their capacities. Figure 3-5 illustrates the 275-TAF reservoir inundation area compared with the Los Vaqueros Reservoir. Power options under Alternative 2 would be the same as those for Alternative 1. Recreational facilities under Alternative 2 would also be the same as those for Alternative 1.

Operations

The water system operations assumed for this alternative were designed to identify the impacts and benefits associated with using an expanded Los Vaqueros Reservoir system primarily to improve Environmental Water Management. This alternative results in some increases in Water Supply Reliability, but not to the same extent as Alternative 1. Operations were adjusted through an iterative analytical process (described in Appendix C) to meet the project objectives while minimizing impacts and avoiding harm to other water users. Alternative 2 also meets the secondary objective of water quality improvement. Environmental Water Management, Water Supply Reliability, and Water Quality benefits are quantified and presented in Section 4.2. This alternative assumes 20 TAF of the expansion is reserved for CCWD.

Operations would be coordinated with SWP and CVP operations as generally described in Section 3.1.2, Water Rights and Coordinated Operations. It is anticipated that water for South Bay water agencies use and dedicated storage for environmental water would be diverted under existing CVP and SWP water right permits, which would be modified as needed.

Figure 3-8 is a schematic that shows how water would be delivered under Alternative 2.



SOURCE: CCWD, 2008; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-8
Alternative 2 Schematic –
275 TAF Reservoir with South Bay Connection

Environmental Water Management

Under Alternative 2, operations to improve Environmental Water Management would include Improved Fish Screening, No-Diversion Period, Multiple Delta Intake Locations and Dedicated Storage for Environmental Water. The effects and benefits of the first three operations are the same for Alternative 2 as for Alternative 1.

With **Dedicated Storage for Environmental Water**, capacity in the new and enlarged storage and conveyance facilities would be used to provide environmental water supplies for Delta fishery protection, San Joaquin Valley refuges, instream flows or other environmental purposes. For example, water from the expanded Los Vaqueros Reservoir system could be transferred to San Luis Reservoir where it would be available for delivery to Central Valley wildlife refuges, increasing the quantity of water available to these habitat areas. The stored environmental water could also be used to reduce Delta diversions during fish-sensitive periods, to reduce direct take at other diversion points, or to provide flows in rivers for fishery purposes. These benefits would be realized by drawing from the reservoir to provide water supplies to CCWD and the South Bay water agencies to increase flexibility for Reclamation and DWR to manage cold water storage in upstream dams, dam releases, and Delta diversions for fisheries benefits.

Together, the Improved Fish Screening and Dedicated Storage for Environmental Water would result in a long-term annual average of about 245 TAF of water managed for environmental improvement, assuming moderate fishery restrictions.

Water Supply Reliability

Under Alternative 2, operations to increase Water Supply Reliability would include Dry-Year Storage and Emergency Storage. In addition, as in Alternative 1, the Improved Fish Screening described above could increase reliability for the South Bay water agencies by making the deliveries less subject to the short-term interruptions associated with regulatory restrictions on the SWP and CVP Delta export pumps.

Operating Alternative 2 for **Dry-Year Storage** would increase the amount of good quality water available to CCWD from Los Vaqueros Reservoir in dry years by up to 20 TAF at the start of a drought.

Emergency Storage available to the Bay Area region under Alternative 2 is about 215 TAF. This water would be available during shortages caused by natural disasters or other emergencies. Emergency water supplies would be delivered through either the South Bay Connection or the existing interties between water agencies.

Water Quality

Alternative 2 is also expected to result in minor improvements in the quality of water delivered to South Bay water agencies by providing higher quality water from the reservoir instead of the Delta during dry periods and by no longer delivering water through Clifton Court Forebay where warm, shallow, slow-moving water often results in algae growth and a resulting increase in organic

carbon content and taste and odor issues. Additional storage would also provide water quality improvements for CCWD in dry years by increasing the amount of water available for blending.

3.4.4 Alternative 3: Expanded 275-TAF Reservoir, No South Bay Connection, Environmental Water Management Emphasis

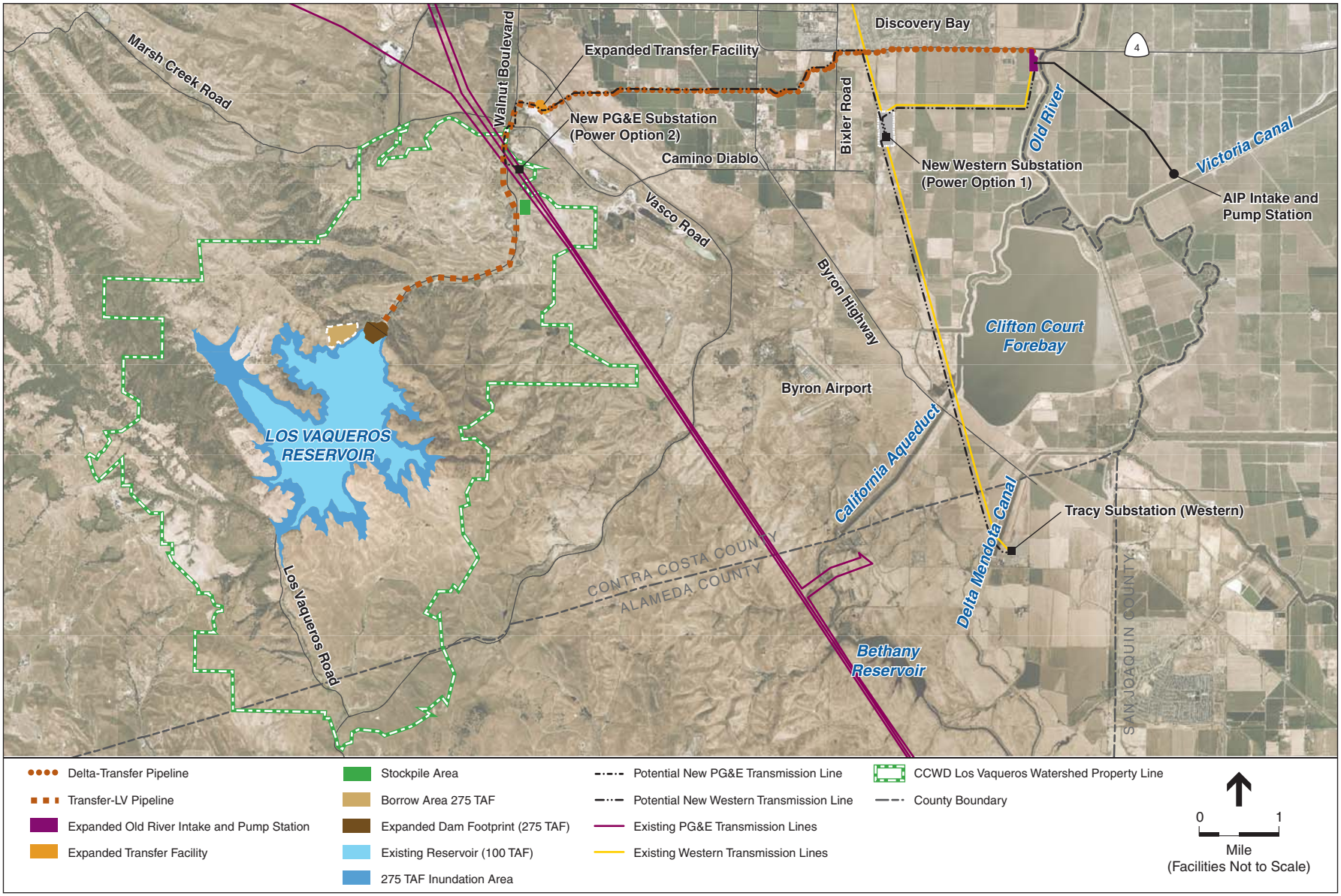
Proposed Facilities

Figure 3-9 shows the proposed facilities under Alternative 3. Under this alternative, new and expanded facilities to increase the storage capacity of Los Vaqueros Reservoir would include a 275-TAF reservoir as in Alternatives 1 and 2 and expanded diversion and filling capacity but would not include the South Bay Connection or a new Delta Intake and Pump Station. This alternative represents a "reduced facility" scenario relative to Alternatives 1 and 2. It allows for an evaluation of the environmental impacts of reduced facilities and the extent to which an expanded Los Vaqueros Reservoir could be operated to partially meet the project objectives without connecting to the South Bay water agencies. Figure 3-5 illustrates the 275-TAF reservoir inundation area compared with the Los Vaqueros Reservoir.

Without the South Bay Connection, other project components under Alternative 3 would be fewer and smaller than under Alternatives 1 and 2 because diversion rates would be lower. A new Delta intake would not be required. The Old River Intake and Pump Station would be expanded by replacing the existing pumps with higher capacity pumps and installing additional fish screens within existing vacant bays. All expansion work would be conducted within the existing facility site and would not require work within Old River. Total diversion capacity for Alternative 3 would be 570 cfs, with the AIP providing 250 cfs and an Expanded Old River Intake and Pump Station providing 320 cfs. Under Alternative 3, the intake operating permits would be modified to allow combined diversions of 570 cfs. This would not allow more water to be diverted from the Delta than would be allowed under existing water right permits, but it would change the location where the water is diverted and some of the restrictions on the Los Vaqueros system intakes.

Under Alternative 3, a new pipeline would be installed parallel to the existing pipeline between the Old River Intake and Pump Station and the Transfer Facility to increase conveyance capacity. The new pipeline capacity of 250 cfs would be smaller than the 350-cfs pipeline in Alternatives 1 and 2. In addition, a new pipeline would be installed parallel to the existing pipeline between the Transfer Facility and the Los Vaqueros Reservoir to provide 570 cfs of conveyance capacity to fill the expanded reservoir. The existing Transfer Pipeline would be used to convey release flows to the Contra Costa Canal via the Los Vaqueros Pipeline at up to 400 cfs.

Additional power supplies would be required at the Expanded Old River Intake and Pump Station and Expanded Transfer Facility. Power could be supplied via either of two options: Power Option 1: Western Only would extend new supply facilities from and construct upgrades to existing Western facilities; Power Option 2: Western & PG&E would extend new supply facilities from and construct upgrades to existing Western and PG&E facilities. The power options are described in detail in Section 3.5.4.



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

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-9

Proposed Facilities – Alternative 3

Existing recreational facilities within the Los Vaqueros Watershed that are disturbed or displaced by the reservoir expansion would be relocated or replaced. Alternative 3 also includes construction of additional recreational facilities as described in detail in Section 3.5.5.

Operations

The water system operations assumed for this alternative were designed to evaluate whether it would be possible to achieve the project objectives without constructing the South Bay Connection or the new Delta Intake and Pump Station. Because Alternative 3 does not include the South Bay Connection, CVP and SWP supplies would not be delivered to the South Bay water agencies through the expanded Los Vaqueros Reservoir system, and the potential fisheries and reliability benefits associated with Improved Fish Screening would not be achieved. This alternative also would not provide increased water supply reliability for these agencies.

Alternative 3 water system operations emphasize the use of an expanded Los Vaqueros Reservoir to improve Environmental Water Management. Operations were adjusted through an iterative analytical process (described in Appendix C) to meet the project objectives while minimizing impacts and avoiding harm to other water users. Alternative 3 would also meet the secondary objective of water quality improvement. Environmental Water Management, Water Supply Reliability, and Water Quality benefits are quantified and presented in Section 4.2. This alternative assumes 20 TAF of the expansion is reserved for CCWD.

Operations would be coordinated with SWP and CVP operations as generally described in Section 3.1.2, Water Rights and Coordinated Operations. It is anticipated that water for dedicated storage for environmental water would be diverted under existing CVP water right permits, modified as needed.

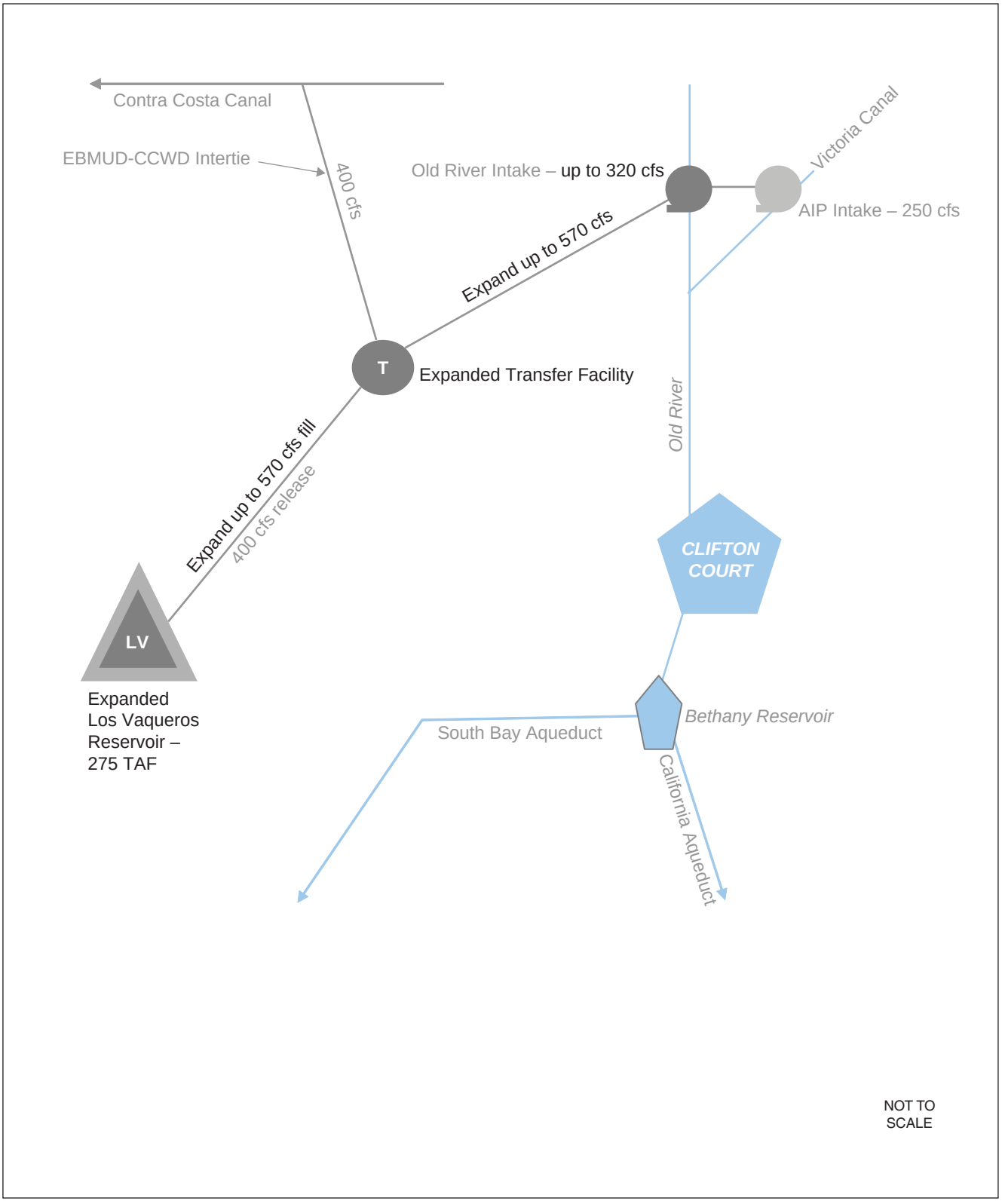
Figure 3-10 is a schematic that shows how water would be delivered under Alternative 3.

Environmental Water Management

Operations to improve Environmental Water Management under Alternative 3 would include the No-Diversion Period, Multiple Delta Intake Locations, and Dedicated Storage for Environmental Water.

With the **No-Diversion Period**, CCWD would cease pumping from the Delta during critical fish periods in the spring and instead rely on releases from the expanded Los Vaqueros Reservoir. **Multiple Delta Intake Locations** (Old River Intake and Pump Station and AIP) could be managed adaptively to reduce impacts on fish.

With **Dedicated Storage for Environmental Water**, additional stored water in the expanded reservoir would be reserved for environmental purposes. CCWD could refrain from pumping from the Delta and instead draw from the stored Los Vaqueros Reservoir supplies to serve its customers during periods that would allow Reclamation to retain cold water stored in upstream reservoirs. The water stored upstream of the Delta in CVP reservoirs that had been reserved for delivery to CCWD could be reallocated for environmental purposes. These purposes could include cold



SOURCE: CCWD, 2008; and ESA, 2008

Figure 3-10
Alternative 3 Schematic –
275 TAF Reservoir with No South Bay Connection

water releases to support salmon spawning or pulse flow releases to support salmon migration in addition to water for wildlife refuges or other environmental purposes. The CVP water supply foregone by CCWD in this manner could also be conveyed through the Delta by existing export facilities for environmental purposes south of the Delta.

Analysis of the use of the Dedicated Storage for Environmental Water to supply wildlife refuges south of the Delta shows a long-term annual average of about 20 TAF of water managed for environmental improvement, assuming moderate fishery restrictions. This amount increases to about 65 TAF per year in drought years.

Water Supply Reliability

Under Alternative 3, operations to increase Water Supply Reliability would include Dry-Year Storage and Emergency Storage.

Operating for **Dry-Year Storage** would increase the amount of good quality water available to CCWD from Los Vaqueros Reservoir in dry years by up to 20 TAF at the start of a drought.

Emergency Storage available to the Bay Area region under Alternative 3 is about 235 TAF. This water would be available during shortages caused by natural disasters or other emergencies. Emergency water supplies would be delivered through existing interties between water agencies.

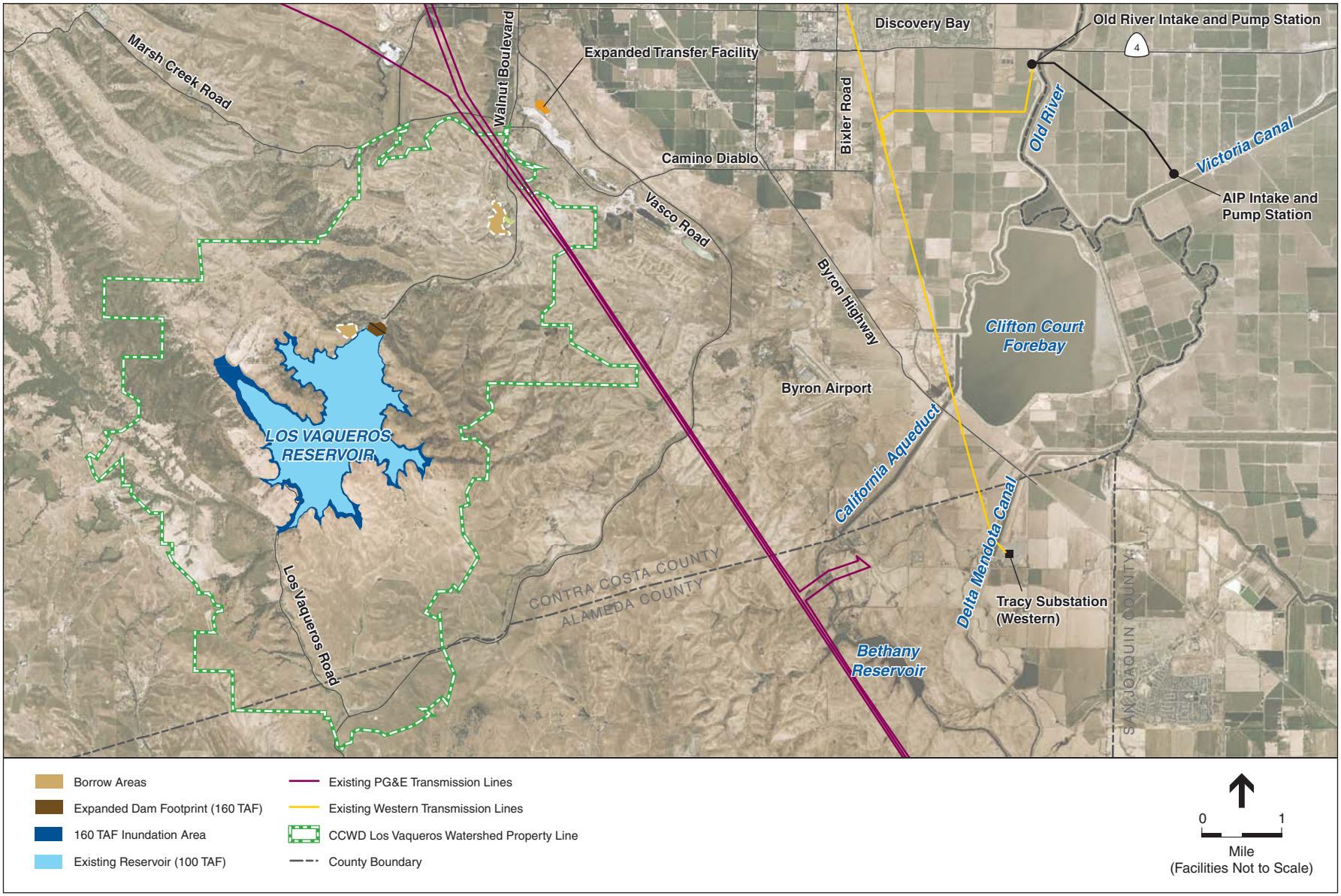
Water Quality

Additional storage in an expanded Los Vaqueros Reservoir would provide water quality improvements for CCWD in dry years by increasing the amount of water available for blending. CCWD could also receive additional incidental water quality benefits under Alternative 3 if releases of the Dedicated Storage for Environmental Water were made to reduce CCWD diversion of Delta water at times when Delta salinity is high. Such operations would not necessarily occur at times of high Delta salinity, so they do not guarantee additional water quality benefit for CCWD.

3.4.5 Alternative 4: Expanded 160-TAF Reservoir, No South Bay Connection, Water Supply Reliability Emphasis

Proposed Facilities

Alternative 4 is the smallest reservoir expansion under consideration and has fewer new or expanded facilities than under Alternatives 1, 2 and 3. Under Alternative 4, Los Vaqueros Reservoir would be expanded from 100 TAF to 160 TAF. A new Delta Intake and Pump Station would not be constructed and the Old River Intake and Pump Station would not be expanded. No increased conveyance capacity or power facilities would be constructed. The South Bay Connection would not be constructed. **Figure 3-11** shows the proposed facilities under this alternative. Figure 3-5 shows the 160-TAF reservoir inundation compared to both the Los Vaqueros Reservoir and the 275-TAF reservoir proposed under Alternatives 1, 2, and 3. Recreational facilities affected by inundation from the expanded reservoir would be relocated or replaced.



SOURCE: USDA, 2006; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-11

Proposed Facilities – Alternative 4

Based on preliminary design studies, minor upgrades to the existing pumps at the Transfer Facility would be required. All work would be done within the existing facility site.

Alternative 4 is a "reduced project" alternative. It has been included to evaluate the extent to which the project objectives could be achieved if a smaller reservoir were constructed to provide water supply reliability improvements and water quality benefits for CCWD and its customers and for other Bay Area water agencies that have existing interties or connections with CCWD's water supply system and that choose to participate in the project. This alternative also enables the public and decision-makers to evaluate the tradeoffs between avoiding some categories of environmental impacts by reducing the size of the reservoir and foregoing the South Bay Connection while still achieving the project objectives.

Operations

The smaller reservoir expansion constructed under Alternative 4 would be operated primarily to increase Water Supply Reliability for CCWD customers and other potential Bay Area water agency participants to which CCWD can deliver water directly through interties or indirectly by exchange in times of shortage. Operations were adjusted through an iterative analytical process (described in Appendix C) to meet the project objectives while minimizing impacts and avoiding harm to other water users.

Figure 3-12 is a schematic that shows how water would be delivered under Alternative 4.

Environmental Water Management

Operations to improve Environmental Water Management under Alternative 4 would include the No-Diversion Period and Multiple Delta Intake Locations. Additional operations required under the current Biological Opinions that govern CCWD's operation of the existing Los Vaqueros Reservoir are assumed to be in place under this alternative, including a 75-day no-fill period in the spring.

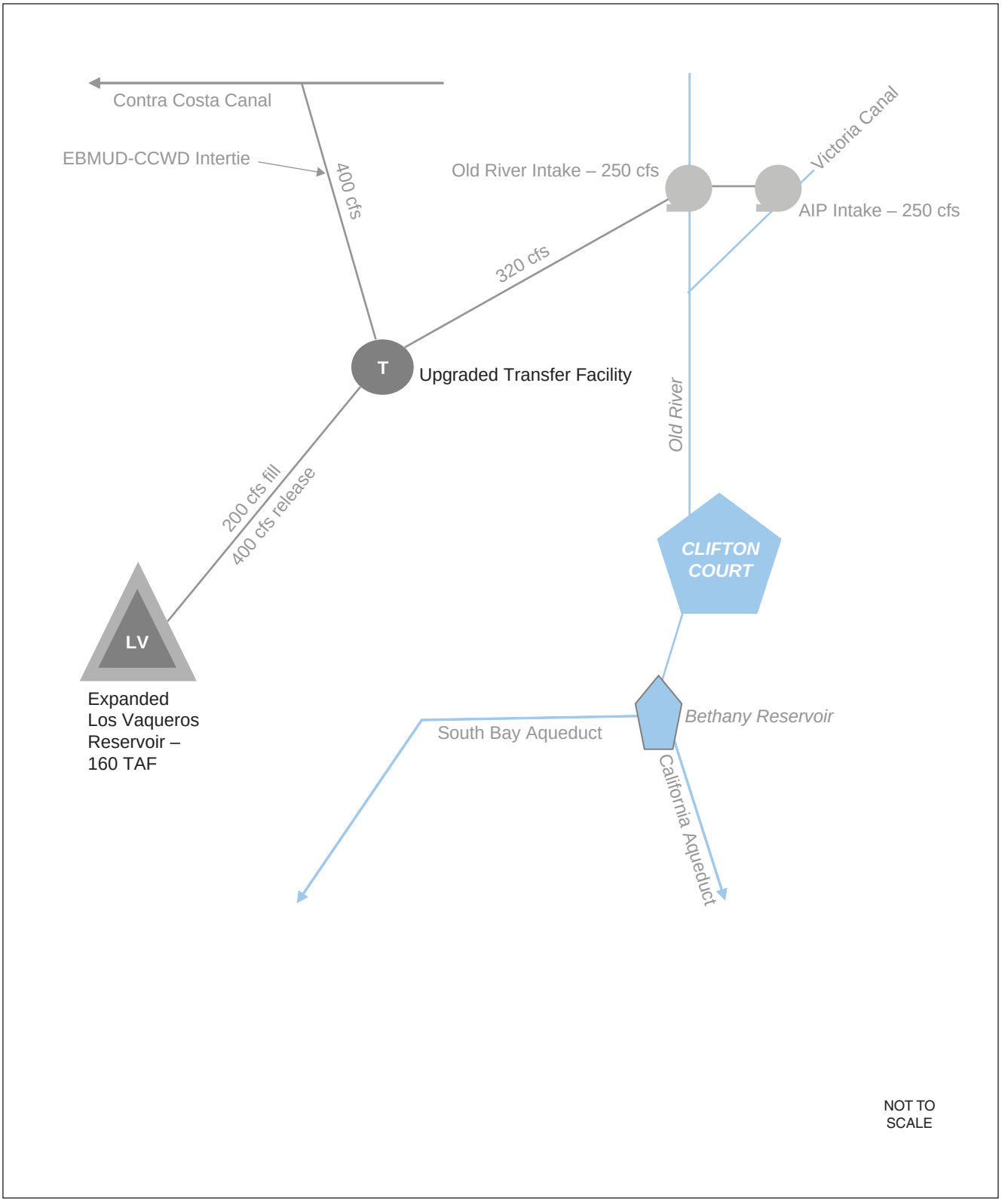
During the **No-Diversion Period**, CCWD would cease pumping from the Delta during critical fish periods in the spring and instead rely on releases from the expanded Los Vaqueros Reservoir as it currently does. The additional storage constructed under Alternative 4 would reduce the number of years in which CCWD is exempt from the No-Diversion Period when there is insufficient stored water in Los Vaqueros Reservoir. However, this increased benefit would be small.

Multiple Delta Intake Locations (Old River Intake and Pump Station and AIP) would continue to be managed adaptively to reduce impacts to fish.

Although not assumed in the water modeling for this Draft EIS/EIR, the 160-TAF reservoir could be operated with Dedicated Storage for Environmental Water.

Water Supply Reliability

Under Alternative 4, operations to increase Water Supply Reliability would include Dry-Year Storage and Emergency Storage.



SOURCE: CCWD, 2008; and ESA, 2008

Figure 3-12
Alternative 4 Schematic –
160 TAF Reservoir with No South Bay Connection

Operating for **Dry-Year Storage**, would increase the amount of good quality water available from Los Vaqueros Reservoir to CCWD and other participating Bay Area water agencies to which CCWD can deliver water directly through interties or indirectly by exchange. The increase in available water would be up to 60 TAF at the start of a drought.

Emergency Storage available to the Bay Area region under Alternative 4 is about 120 TAF. This water would be available during shortages caused by natural disasters or other emergencies. Emergency water supplies would be delivered through existing interties between water agencies.

Water Quality

Additional storage in an expanded Los Vaqueros Reservoir would provide water quality improvements for CCWD in dry years by increasing the amount of water available for blending, to a greater extent than under Alternatives 1, 2, and 3.

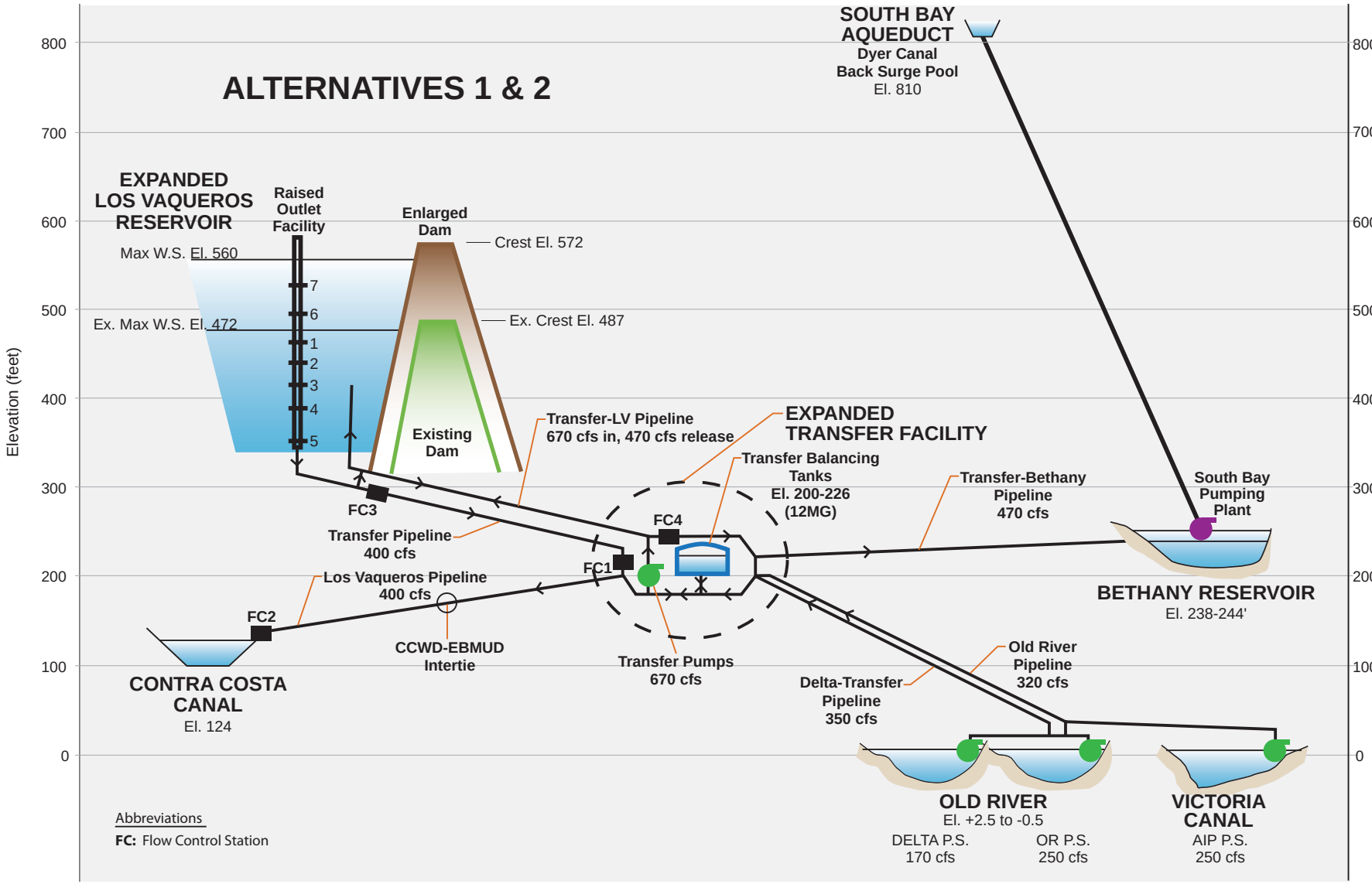
3.5 Proposed Facilities – Detailed Description

This section presents details regarding site location, conceptual facility layout, design, and construction for the proposed new or expanded facilities under the four action alternatives. The section also describes how the proposed facilities would be operated in conjunction with CCWD's existing water system facilities. **Figure 3-13** is a hydraulic profile of the existing and proposed facilities under Alternatives 1 and 2, which illustrates how the facilities are related in terms of function and elevation and how water moves through the system by a combination of pumping and gravity flow.

3.5.1 Los Vaqueros Reservoir Expansion / Dam Modification

The existing 100-TAF Los Vaqueros Reservoir provides offstream storage of water that is diverted by CCWD from Old River when source water quality meets CCWD's standards. From the reservoir, CCWD can deliver water to the Contra Costa Canal, via the Transfer and Los Vaqueros Pipelines, for blending with other CCWD supplies. Under Alternatives 1, 2, and 3, the Los Vaqueros Reservoir would be expanded to 275 TAF. Under Alternative 4, the reservoir would be expanded to 160 TAF. Under the No Project/No Action Alternative, no reservoir expansion would take place. Reservoir expansion under the four action alternatives would involve raising the existing dam rather than replacing it with a completely new, larger dam facility.

The Los Vaqueros Reservoir was designed for 100 TAF of storage, and no specific allowance was made in the dam's design to accommodate a future expansion. However, planning studies for the Los Vaqueros Reservoir Expansion Project determined that raising the existing dam to a limited extent would be feasible and would allow for a reservoir expansion up to 275 TAF. The amount of dam raise possible is limited by a combination of topographic constraints and the design of the dam. Reservoir expansion to 275 TAF represents the maximum expansion considered feasible by raising the existing dam rather than replacing it with a completely new dam.



SOURCE: URS, 2008; CCWD, 2008; and ESA, 2008

Figure 3-13
System Elevation Schematic

Reservoir expansion to 275 TAF would raise the water surface level 88 feet for a maximum reservoir water surface elevation of 560 feet msl. The reservoir water surface area (inundation area) would expand approximately 1,000 acres from 1,500 acres to 2,500 acres. The more limited reservoir expansion to 160 TAF, as proposed under Alternative 4, would raise the water surface level 38 feet for a maximum reservoir water surface elevation of 510 feet msl. Under Alternative 4, the reservoir inundation area would increase approximately 400 acres from 1,500 acres to 1,900 acres.

Reservoir expansion would involve the dam raise modifications as well as construction of appurtenant facilities including the spillway, the inlet/outlet works, and the reservoir oxygenation system. Each of these is described in more detail below.

Dam Raise Design

Table 3-4 summarizes the characteristics of the dam raise for both the 275-TAF reservoir expansion (Alternatives 1, 2, and 3) and the 160-TAF reservoir expansion (Alternative 4). For both reservoir expansion scenarios, the existing dam would be raised by building on top of the existing dam structure as described below.

TABLE 3-4
CHARACTERISTICS OF THE LOS VAQUEROS DAM MODIFICATION

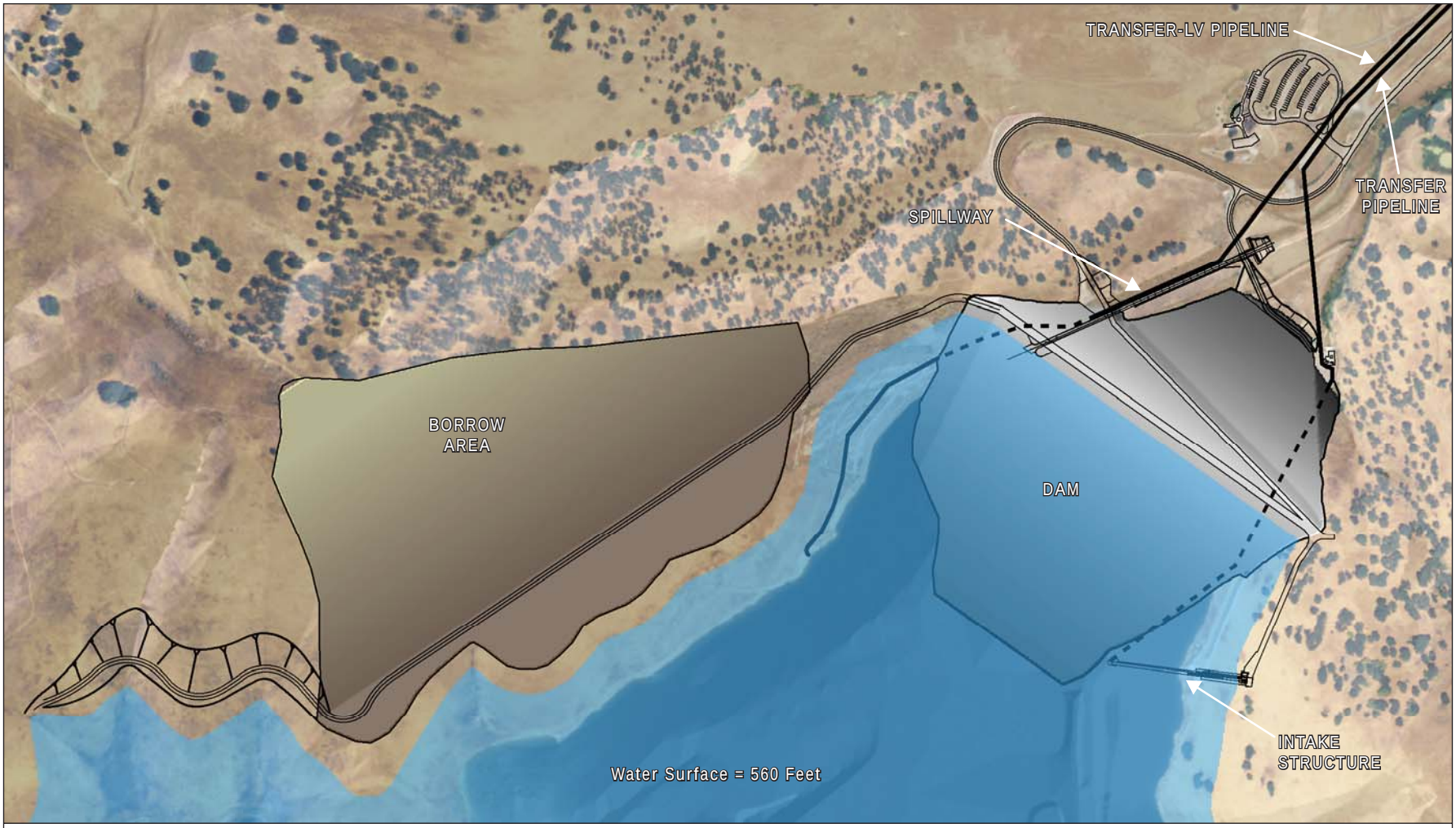
Reservoir Capacity (TAF)	Maximum Reservoir Water Surface Elevation (msl)	Dam Crest Elevation (msl)	Maximum Dam Height Above Downstream Toe (feet)	Total Embankment Volume (Existing plus New) (million cubic yards)	Dam Crest Length (feet)
Existing Reservoir					
100	472	487	192	2.8	1,000
Alternative 4					
160	510	523	230	3.8	1,300
Alternatives 1, 2, and 3					
275	560	572	282	7.6	1,630

msl = mean sea level
TAF = thousand acre-feet

SOURCE: URS, 2007

275-TAF Reservoir – Alternatives 1, 2, and 3

Like the existing dam, the raised dam would be a central core earthfill embankment. **Figure 3-14** shows a plan view of the proposed 275-TAF reservoir dam, and **Figure 3-15** shows a profile view of the raised dam atop the existing dam. The dam would be raised by building on top of both the upstream and downstream shells of the dam. The existing vertical central core and the filter/drainage system would be raised as shown in Figure 3-15. The dam axis would move about 45 feet upstream.

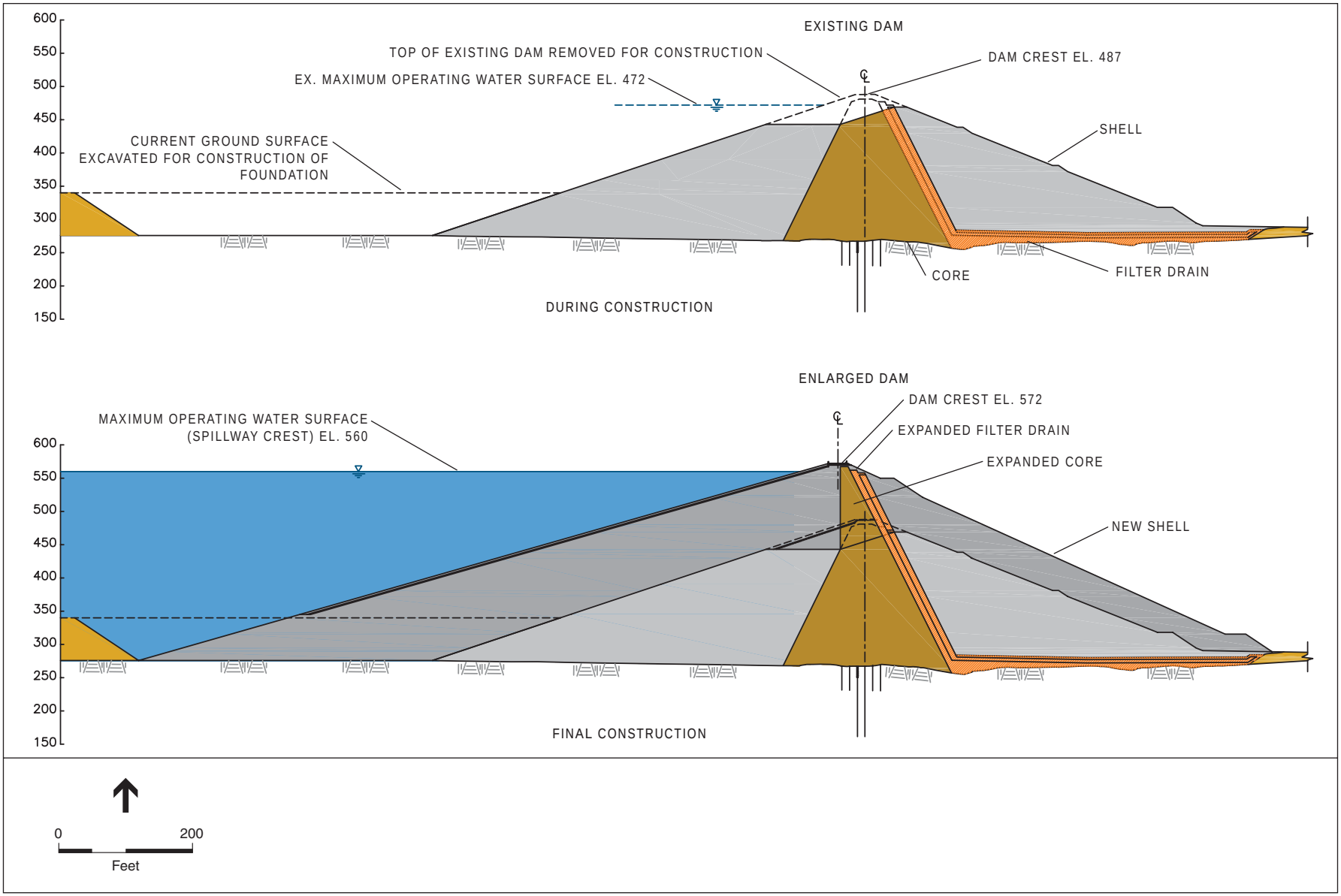


SOURCE: URS Corporation, 2008; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-14

275 TAF Reservoir – Plan View of Dam Raise and Borrow Area



SOURCE: URS Corporation, 2008; and ESA, 2008

Figure 3-15

275 TAF Reservoir – Profile View of Dam Raise

The dam would be 282 feet high and have a crest (or top) elevation of 572 feet msl. The water surface elevation would be 560 feet msl when expanded to the 275-TAF capacity. The dam crest would be 30 feet wide and about 1,630 feet long. The downstream and upstream slopes would be about 2.25:1 and 3.5:1, respectively. The new embankment fill would add about 4.8 million cubic yards to the current dam volume of 2.8 million cubic yards for a total of 7.6 million cubic yards of embankment fill.

The existing reservoir would need to be drained prior to construction. It would remain drained and out of service throughout the estimated 3-year construction period and be refilled following construction completion. The process of draining the reservoir is described below (see "Construction").

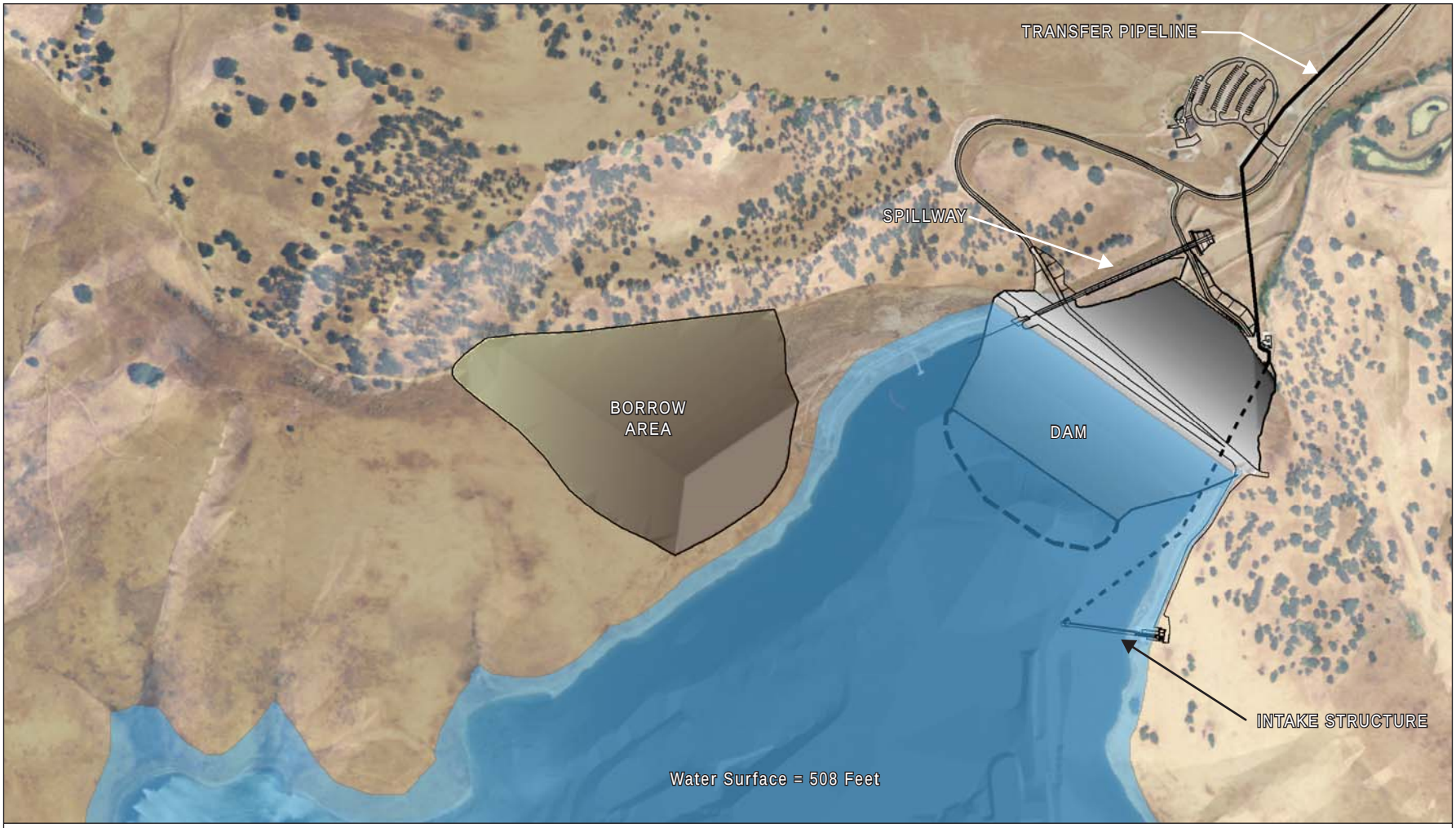
The raised dam would include monitoring and recording instrumentation, similar to the existing equipment, to measure internal water pressures within and seepage from the dam and foundation, settlement of the dam, and earthquake-induced accelerations and deformations. The instruments would include foundation and embankment piezometers, internal and surface settlement and movement sensors, a seepage measurement weir and a series of strong motion acceleragraphs.

160-TAF Reservoir – Alternative 4

Like the existing dam, the raised dam would be a central core earthfill embankment. A plan view of the potential 160-TAF reservoir dam is shown in **Figure 3-16** and a profile view of the raised dam atop the existing dam is shown in **Figure 3-17**. The dam would be raised by building on the downstream shell. The existing vertical central core and filter/drainage system would be raised as shown in Figure 3-16. The dam axis would move about 20 feet downstream. The dam would be 230 feet high and have a crest elevation of 523 feet msl. The reservoir water surface elevation would be 510 feet msl when expanded to the 160-TAF capacity. The crest would be 30 feet wide and about 1,300 feet long. The downstream and upstream slopes would be approximately 2.25:1 and 3.0:1, respectively. The new embankment fill would add about 1 million cubic yards to the current dam volume of 2.8 million cubic yards for a total of approximately 3.8 million cubic yards of embankment fill (see Table 3-4).

The reservoir could remain in operation through most of construction although reservoir drawdown of about 60 TAF may be necessary during the construction period. Determination of the extent of the final drawdown would be made through consultation with DWR's Division of Safety of Dams (DSOD) during final design.

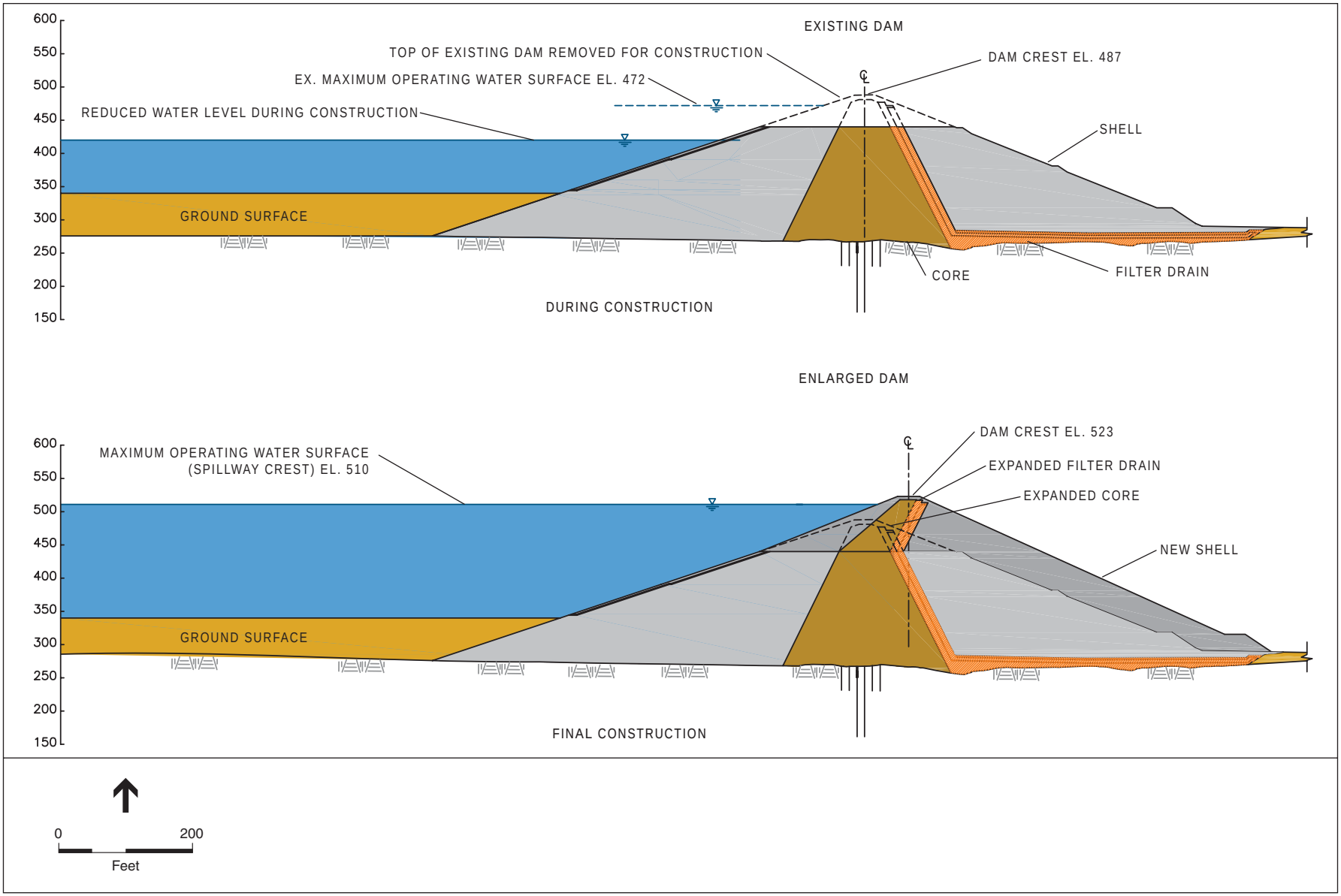
The raised dam for the 160-TAF reservoir would have the same monitoring and recording instrumentation as described for the 275-TAF reservoir.



SOURCE: URS Corporation, 2008; and ESA, 2008

Figure 3-16

160 TAF Reservoir – Plan View of Dam Raise and Borrow Area



SOURCE: URS Corporation, 2008; and ESA, 2008

Figure 3-17

160 TAF Reservoir – Profile View of Dam Raise

Appurtenant Facilities

Spillway

The spillway (a channel over the dam that allows for overflow from the reservoir) for both the 275-TAF and 160-TAF reservoirs would be an extension of the existing spillway on Los Vaqueros Dam. The new portion of the spillway for both reservoir expansion options would be about 375 feet long and, like the existing chute, would have a rectangular cross-section of 15 feet. The existing stilling basin (an impoundment to slow the water conveyed through the spillway) at the base of the chute and a riprap-lined discharge channel to Kellogg Creek would be retained under either expansion option. The spillway would have the capacity to convey the Probable Maximum Flood to ensure that even in the most extreme storm conditions, water levels in the reservoir would not overtop the dam.

Inlet / Outlet Works

275-TAF Reservoir

Getting water into and out of an expanded 275-TAF reservoir would require some new facilities as well as modifications to existing inlet/outlet facilities. A new inlet pipe connected to the Transfer-LV Pipeline at the dam would convey water into the reservoir at a rate of up to 670 cfs. The inlet would be a buried 10-foot-diameter steel pipeline that would be routed adjacent to, and parallel with, the existing spillway chute. The pipeline would route the water through the concrete buttress and along the left abutment to a single discharge port into the reservoir.

The existing outlet facilities on the right dam abutment would be expanded and used to release water from a 275-TAF reservoir. The existing facility is a 7-foot-diameter, steel-lined sloping structure with five ports that can be used to release water from different reservoir water levels to satisfy water quality needs. This structure would be extended up above the new maximum storage elevation and up to three additional ports would be added. Water flowing out of the reservoir through the port structure (also known as an intake structure because water is being brought *into* a water system from a reservoir) would be routed through the existing steel-and concrete-lined outlet tunnel to an outlet structure at the toe of the dam that includes various valves and connects to the Transfer-LV Pipeline that runs to the Transfer Facility. The existing outlet tunnel, outlet structure, and associated valves would be reused without major modification. The existing control building would be demolished and a new building constructed at the top of the raised intake structure.

DSOD guidelines for emergency drawdown (or "evacuation") of large reservoirs require that the dam facilities have the capability to lower the reservoir level by an amount equal to 10 percent of the hydraulic head behind the dam in ten days, and to evacuate the entire reservoir in 120 days. These guidelines are met at Los Vaqueros Reservoir via the outlet tunnel and a valve in the outlet structure that discharges the emergency release flows directly into Kellogg Creek. The maximum discharge rate is currently 1,140 cfs, which exceeds the 10-day average rate of 910 cfs needed to meet the first of DSOD's two guidelines.

The greater storage volume in the 275-TAF reservoir (Alternatives 1, 2, and 3) would increase the 10-day average rate of discharge to meet the state guidelines to 2,430 cfs. Under these

alternatives, the discharge flow would be split between the existing outlet tunnel and valve and the new inlet conduit. With the additional 88 feet of reservoir head and with the valve fully open, the maximum discharge rate through the existing outlet tunnel would increase to 1,500 cfs. This flow would be discharged to Kellogg Creek. The remaining 930 cfs would be released through the new inlet conduit and Transfer-LV pipeline to either Bethany Reservoir via the Transfer-Bethany Pipeline (Alternatives 1 and 2) or to Old River via the Delta Transfer and Old River Pipelines.

160-TAF Reservoir

The existing inlet/outlet works would be retained with this level of expansion. Pumping into and releasing water from the reservoir would occur via the existing facilities through the right abutment. The existing outlet facility (also called the intake structure) would be extended up above the new maximum storage elevation, but no additional ports would be added. The existing control building would be demolished and a new building constructed at the top of the raised intake structure. Other changes to the outlet structure and associated valves would not be necessary. Emergency reservoir drawdown requirements would be met with the current outlet tunnel and valve, although with the increased head, a larger valve may be required. This valve releases water down Kellogg Creek.

Reservoir Oxygenation System

The existing reservoir has an oxygenation system that is designed to enhance the quality of water in the hypolimnion, which is the bottom or lower zone of water within the reservoir. This system would need to be relocated and/or upgraded to accommodate either the 160-TAF or 275-TAF reservoir. Oxygenating the hypolimnion helps maintain sufficient residual oxygen in the deeper reservoir waters, which improves water quality, reduces tastes and odors so water from this level in the reservoir can be used for consumption, and makes the water habitable for fish. During the oxygenation process, liquid oxygen (LOX) is vaporized, piped to a diffuser grid on the bottom of the reservoir, and then released into the reservoir as oxygenated bubbles.

The existing oxygenation facilities are on the downstream face of the dam and include two horizontal liquid oxygen tanks, ambient vaporizers, control valving, instrumentation and telemetry panel, and site access for LOX delivery and operation personnel. LOX is generated off site and trucked to facility storage tanks. These facilities would be relocated in the same general area as part of the dam modification process under any alternative and may be upgraded to effectively oxygenate the larger reservoir.

Construction

Construction of the expanded reservoir would involve the dam raise as well as construction of the appurtenant facilities. The following subsections describe the construction of these aspects of the project.

Dam Raise Materials

Raising the existing dam requires additional claystone and sandstone materials to enlarge the dam shell as well as clay material to extend the dam core. To minimize truck trip length and associated emissions and to reduce cost, most of the materials for the dam raise would be

obtained from sites within the watershed from designated borrow areas. The dam for both the 275-TAF and 160-TAF reservoirs would have a system of filters and drains to control seepage through the dam and foundation. Materials for sand filters and gravel drains would be imported from commercial sources within the region. Haul distances would be between 25 and 30 miles. Other materials required for construction of the dam raise and associated facilities include both raw and pre-fabricated materials that would be transported to the project site such as gravel, aggregate, bulk cement, steel, pipeline segments, pre-fabricated building materials, and mechanical and electrical equipment.

Sand, gravel, and rock materials imported to the project area would be tested prior to acquisition and transport to determine the presence of hazardous, corrosive, or other substances that could affect use of the materials, environmental exposure, or disposal options. CCWD's construction specifications require contractors to ensure these materials meet industry standards set forth by the American Society of Testing and Materials, among other groups.

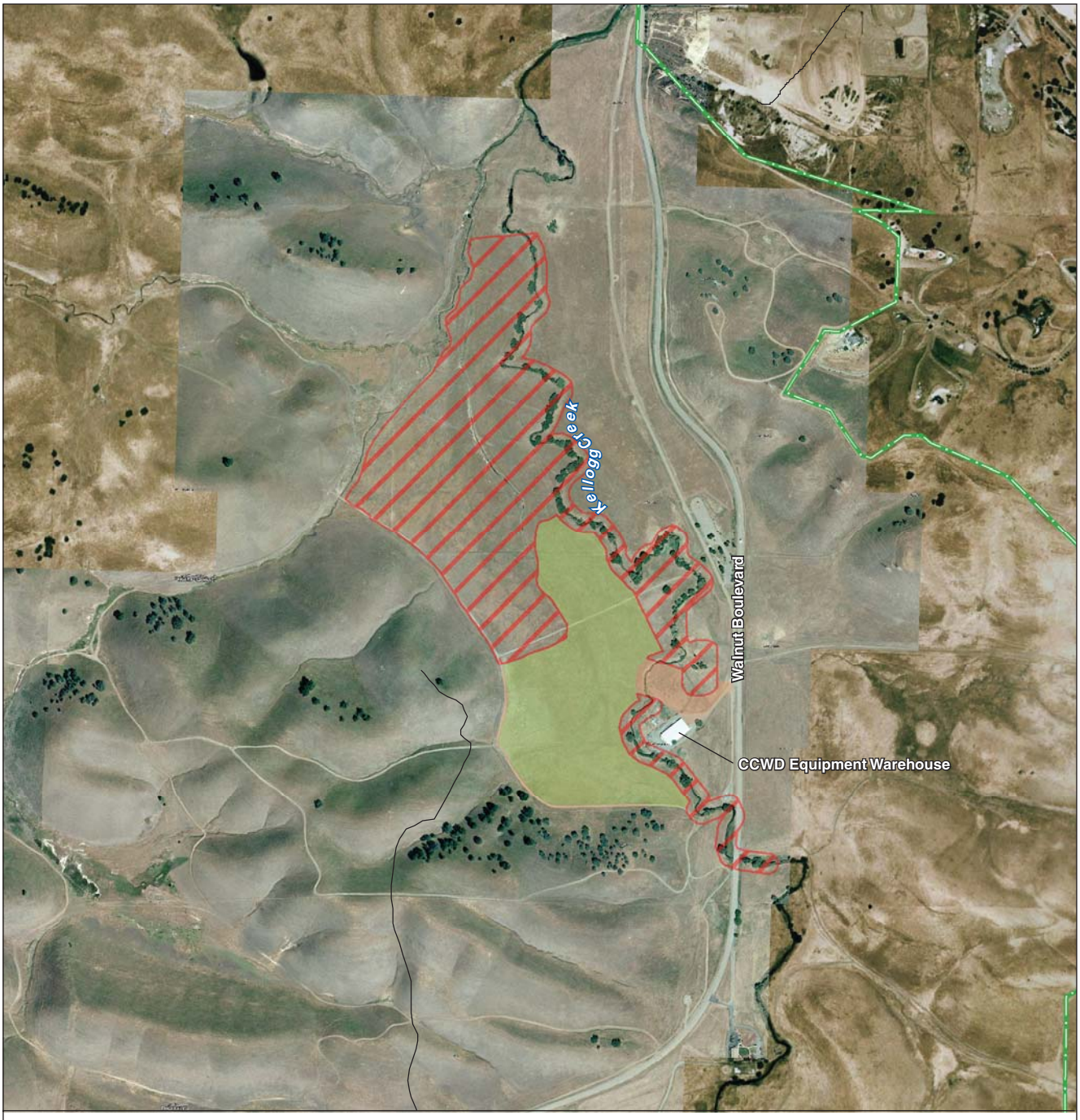
Material Borrow Areas

Shell Borrow Area (275 TAF and 160 TAF). The upstream and downstream dam shell would be constructed of claystone and sandstone obtained from a borrow area just upstream of the left abutment (see Figures 3-14 and 3-16, respectively). The borrow area would be about 36 acres for the larger 275-TAF dam raise and 22 acres for smaller 160-TAF dam raise. This borrow area would be an extension of the borrow area developed for the construction of the existing dam. Riprap to armor the upstream slope would also be obtained from this borrow area.

Core Borrow Area (275 TAF). The clay for the central core of the 275-TAF reservoir dam would be excavated from the alluvial clay deposits naturally occurring on the floor of the reservoir from the general area where the core materials for the existing dam were obtained. This area is inundated by the existing reservoir.

Core Borrow Area (160 TAF). For the 160-TAF reservoir dam, alluvial clay deposits on the floor of the existing reservoir would not be available for use in constructing the dam raise because the reservoir would not be fully drained. Therefore, approximately 270,000 cubic yards of clay would be excavated from the naturally occurring alluvial deposits in the valley floor approximately 2.5 miles downstream of the dam. Because the engineering properties of these alluvial deposits are still under investigation, the specific location and size of this borrow area is being evaluated. Therefore, a borrow area zone has been identified for impact analysis purposes, as shown in **Figure 3-18**. Restricted areas, where no borrow activities would occur, have been identified based on the evaluation of sensitive biological and potential cultural resources. The area marked in green on Figure 3-18 is the proposed area for borrow activities analyzed in this EIS/EIR. For purposes of this analysis, it is assumed that access to the borrow area for the 160-TAF reservoir dam would be via an existing access road off Walnut Boulevard and a new temporary bridge to be installed over Kellogg Creek.

The specific location and layout of the borrow area has yet to be determined within the siting zone. The dimensions and depth of this borrow area will depend on the location, depth, and quality of the clays available. Topsoil would be removed from the borrow area, the underlying clay extracted



SOURCE: GlobeXplorer, 2007; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-18

160 TAF Reservoir – Core Borrow Area

and the topsoil replaced. This area would be restored and revegetated once borrow activities are completed and would be evaluated as a possible site for creation of compensatory wetlands and/or ponds for California red-legged frog (*Rana draytonii),* California tiger salamander (*Ambystoma californiense*) and/or vernal pool fairy shrimp as part of the project mitigation program.

Materials and Equipment Stockpile and Staging Areas

Although the dam raise would be constructed in large part from local materials quarried from nearby borrow areas, certain materials would need to be imported and stockpiled near the dam in sufficient quantity to maintain an adequate flow of materials. Some material would be stockpiled adjacent to the existing dam on the downstream side. In addition, for Alternatives 1, 2, and 3, another estimated 15-acre stockpile/staging area was identified along Walnut Boulevard near the entrance to the watershed. Alternative 4 would not require a 15-acre stockpile/staging area.

Materials Disposal

For the 275-TAF reservoir, excess earthen materials would be disposed of within the reservoir inundation zone at a suitable distance from the dam to avoid interference with reservoir operations. For the 160-TAF reservoir, excess earthen materials would be disposed immediately downstream at the toe of the dam. Although not expected based on experience from construction of the original dam, any spoils or waste materials not suitable for disposal in the reservoir inundation zone or at the dam site would be hauled to a suitable location for recycling or disposal. The final disposal areas selected would depend on the type and volume of material to be disposed.

Draining the Reservoir for Construction

275-TAF Reservoir

Raising the existing dam for expansion to 275 TAF (Alternatives 1, 2, and 3) would require construction on the upstream and downstream sides of the existing dam and would therefore require that the reservoir be empty during construction. Draining the reservoir would be accomplished primarily by the planned release of the water into the CCWD distribution system, which could take six months to one year to accomplish. The existing reservoir water elevation would be drawn down to the level of the lowest port on the existing reservoir outlet (350 feet in elevation). The remaining 3 to 4 TAF of water that could not be released through the dam outlet would be pumped out through the lower port. It is expected that this water would be adequately mixed and aerated and would be either sent down the transfer pipeline for use in the CCWD service area or discharged to a creek or drainage channel consistent with regulations. Any water not suitable for release may require evaporation ponds or special treatment.

The Los Vaqueros Reservoir would be out of service for about four years from the time the reservoir was completely drained to allow for construction of the dam expansion through refilling the expanded reservoir. The amount of time needed to refill the reservoir would depend 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 East Bay Municipal Utility District (EBMUD)-CCWD Intertie. Under current reservoir operations, most blending for water quality is

done in the fall when the quality at the Old River Intake and Pump Station declines. However, water quality is higher at the AIP during the 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 and Pump Station. 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.

160-TAF Reservoir

The 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 be necessary during the construction period; however, the final determination of the extent of the drawdown would be made through consultation with DSOD during final design.

Kellogg Creek Flow Bypass

For Alternatives 1, 2, and 3, once the remaining water is removed, a groundwater cutoff trench would be installed upstream of the dam footprint to enable excavation of the foundation upstream of the toe of the existing dam. A temporary cofferdam would be constructed upstream of the cutoff trench. A temporary diversion pipe would be installed to divert any inflows from Kellogg Creek around the dam and into Kellogg Creek to maintain the flows required in CCWD's water rights and Biological Opinions and to sustain the habitats dependent on these flows.

Construction Activities

275-TAF Reservoir

Construction of the 275-TAF reservoir dam, including appurtenant facilities, is estimated to require 24 to 30 months. As described above, prior to construction, water would be drained from the existing reservoir. Once the remaining water is removed, a groundwater cutoff trench would be installed upstream of the dam footprint to enable excavation of the foundation upstream of the toe of the existing dam. A temporary cofferdam would be constructed upstream of the cutoff trench.

About 1,000,000 cubic yards of wet alluvium and spoil from the existing dam would be excavated between the groundwater cutoff and the upstream shell of the dam. The wet soil would be moved to a location on the reservoir floor to dry.

Construction of the dam embankment would begin in the second half of Year 1 and be completed in Year 2. Grouting the upper abutments would occur concurrently with foundation excavation and embankment fill placement. About four months would be required to place about 100,000 cubic yards of concrete on the left abutment.

Construction of the extension of the existing sloping intake tower and structural modification of the existing outlet control structure could be completed in the first construction season. Construction

of the mechanical/electrical and structural components of the outlet sloping intake structure and the downstream inlet/outlet control structures would be completed in Year 1 once the extension of the sloping intake structure is finished.

Equipment would include dump trucks, a small bulldozer, vibratory rollers, front-end loaders, and the concrete mixing plant.

160-TAF Reservoir

Construction of the 160-TAF reservoir dam is estimated to require 18 months to reach substantial completion (including a three-month hiatus during the winter). Mobilization, including construction of access roads, would occur during the first quarter of Year 1. The reservoir would be drawn down to the level required for construction prior to construction. Downstream excavation and construction of the additional embankment fill would begin in the second quarter of Year 1 and be completed by the end of the year.

Grouting the upper abutments would occur concurrently with foundation excavation and embankment fill placement. Approximately two months would be required to place 20,000 cubic yards of concrete on the left abutment. Equipment would include dump trucks, a small bulldozer, vibratory rollers, front-end loaders, and the concrete mixing plant.

Construction of the extension of the existing sloping intake tower and structural modification of the existing outlet control structure could be completed concurrently with fill placement. Construction of the mechanical/electrical and structural components of the outlet sloping intake structure and the downstream inlet/outlet control structures would be completed once the extension of the sloping intake structure is finished.

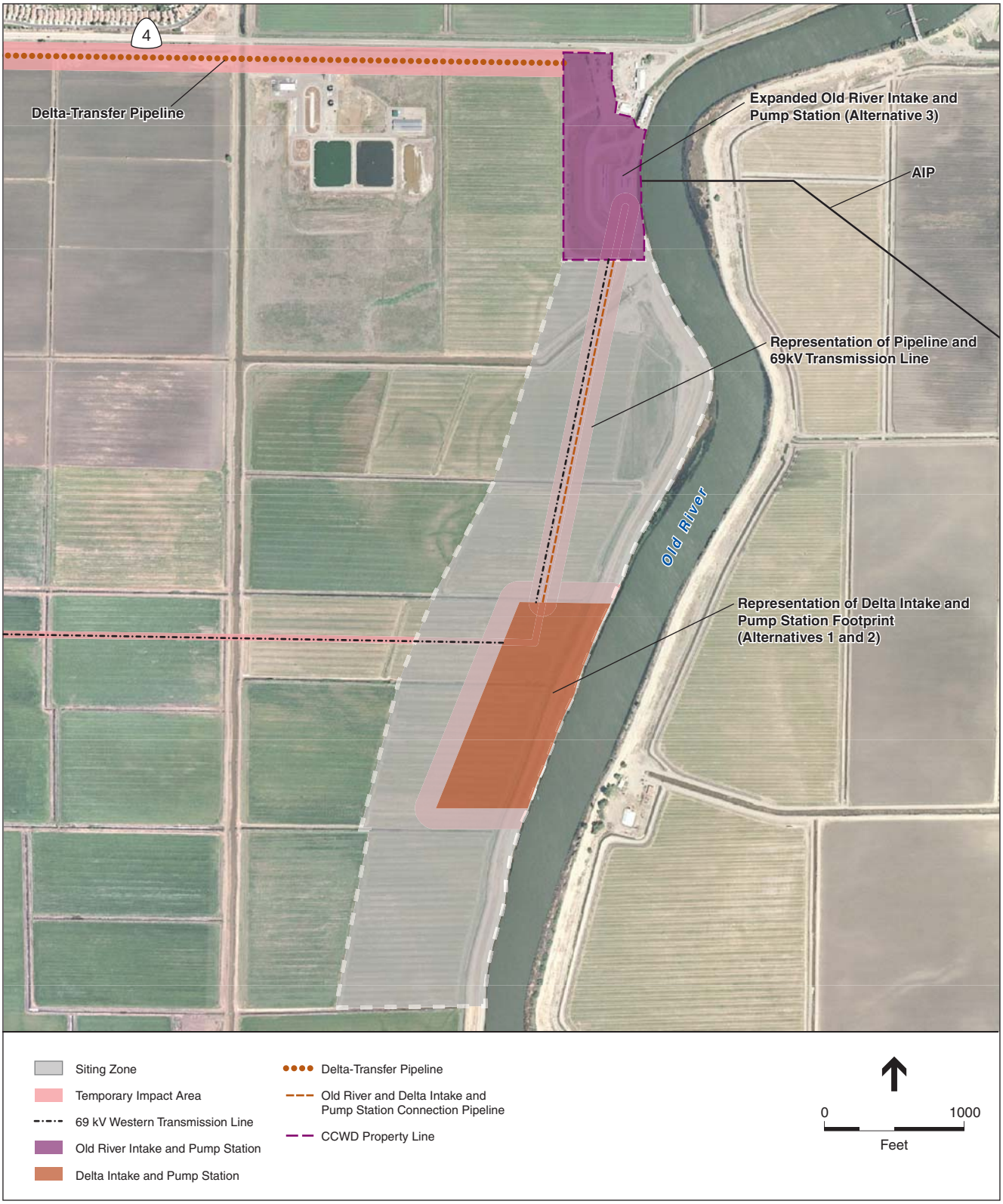
3.5.2 Delta Intake Facilities

All four alternatives would incorporate operation of CCWD's existing Delta intakes (AIP and Old River Intake and Pump Station) into their operations. Alternatives 1 and 2 would also require construction of a new intake and pump station to divert Delta water. Alternative 3 would include an expansion of the Old River Intake and Pump Station. Alternative 4 would not include any additional intake capacity. The intake facilities are shown on **Figure 3-19**. The relationship of the intakes to the rest of the expanded Los Vaqueros Reservoir system is shown on Figure 3-13.

New Delta Intake and Pump Station

Site Location and Design

Under Alternatives 1 and 2, a new Delta Intake and Pump Station would be required to pump water from Old River and convey it to the Transfer Facility and/or the South Bay Connection (Bethany Reservoir). The additional capacity is needed because more water would be pumped to fill the larger reservoir and for direct delivery to the South Bay water agencies. Water pumped from the new Delta Intake and Pump Station to the Transfer Facility would then either be pumped up to the expanded reservoir or continue through the Transfer-Bethany Pipeline to Bethany Reservoir. The new Delta Intake and Pump Station facility would be along Old River east of Byron and south



SOURCE: GlobeXplorer, 2007; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-19
Intake Facilities

of State Route 4, just south of CCWD's existing Old River Intake and Pump Station, as shown in Figure 3-19.

The new Delta Intake and Pump Station would be sited on approximately 22 acres. Additional engineering and geotechnical investigations are required to select the final site location. Therefore, for purposes of this EIS/EIR, a broader siting zone has been evaluated within which the 22-acre facility would be located (See Figure 3-19). A pipeline connecting the new Delta Intake and Pump Station to the Old River Intake and Pump Station and a 69-kilovolt (kV) electrical transmission line would be installed within this siting zone.

The new Delta Intake and Pump Station would include a reinforced concrete wet well structure with state-of-the-art positive barrier fish screens. An earthen setback levee would be constructed around the site to provide levee protection during construction of the intake and to maintain continuity of the road system along the levee after construction. A conceptual layout of this facility is shown on **Figure 3-20**.

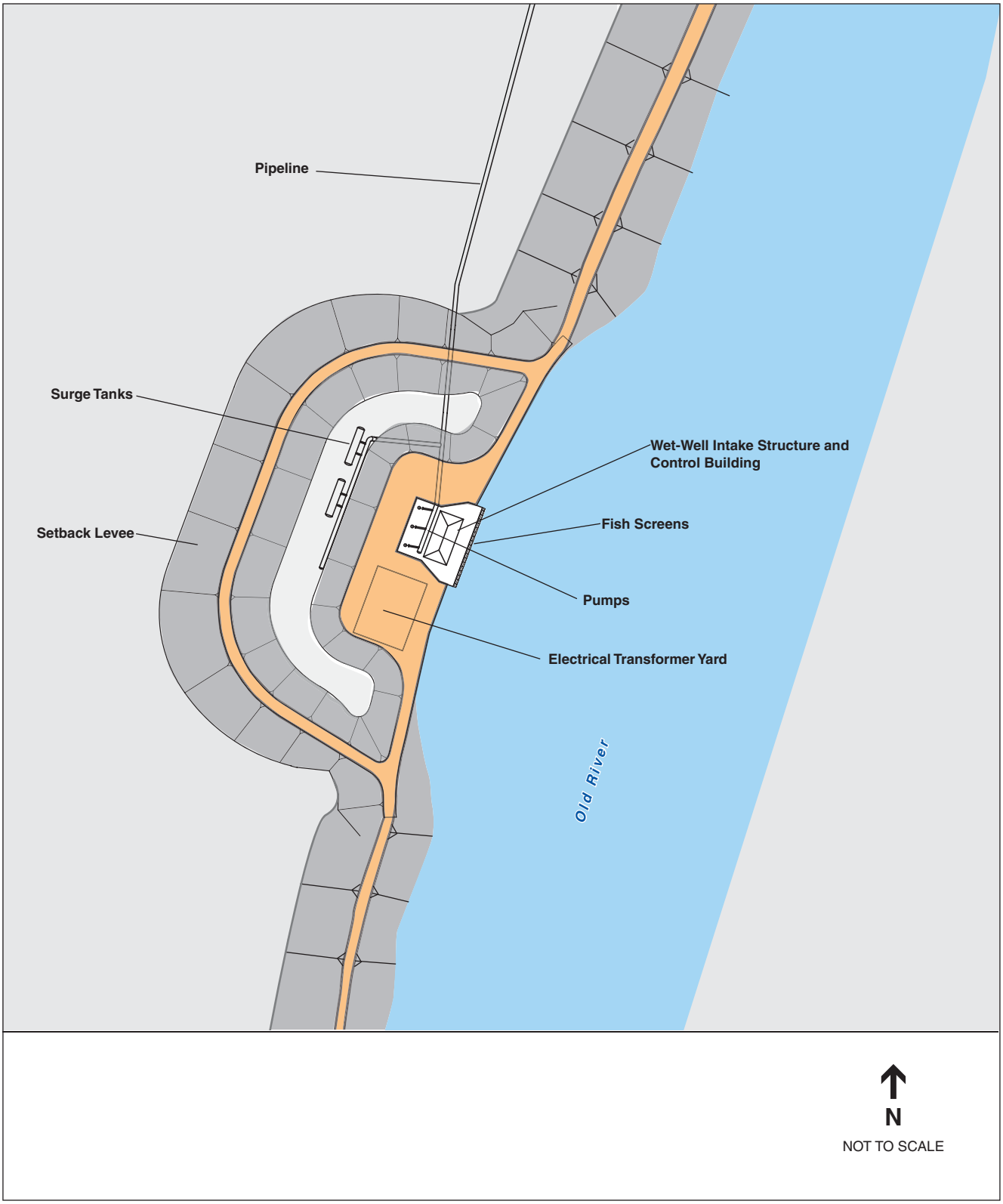
This facility would include a pump station with a capacity to deliver up to 170 cfs (up to five pumps), surge tanks (up to two tanks, 40 feet long), a motor control center building, and an electrical transformer yard. Access to the site would be on existing roads. The facility site would be fenced.

Site Development

The conceptual site design for the new Delta Intake and Pump Station is shown on Figure 3-20. The facility would have a similar design to the existing Old River Intake and Pump Station. The site, now in agricultural use, would be completely cleared prior to construction. The subsurface conditions in the siting zone for the new Delta Intake and Pump Station are expected to be composed of a series of fine sands, silts, clays, and peat that are highly compressible and of low strength. Accordingly, the facility would need to be supported on a foundation system such as driven concrete, steel piles, or stone columns. For purposes of the impact analysis in this Draft EIS/EIR, it is assumed that piles would be driven at an approximate elevation of 50 feet msl and spaced about 15 feet apart on a square grid. In addition to the piles, soil densification would likely be required between the intake and setback levee to reduce the liquefaction potential of the soil and to improve its lateral strength during seismic events. The first step in construction for this facility would be installation of a new setback levee, discussed in the next section. Once the setback levee and site foundation are established, concrete pouring and steel working activities would proceed. The primary building materials would include structural steel, concrete, and masonry. Facilities would include electrical, hydraulic, and mechanical systems. Generally, excavated soils would be stored on site until used in grading or would be immediately removed from the site for reuse or disposal.

Levee Improvements

Construction of levee improvements would occur in two phases. First, an earthen setback levee would be constructed on the landward side of the existing levee. The setback levee would be integrated with the existing levee to provide continuity of the land/water barrier. Construction activities for the new intake would be initiated along the existing levee edge after the setback levee is completed. All new construction for the setback levee would incorporate modern techniques for soil compaction.



SOURCE: URS, 2008; CCWD, 2008; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-20
New Delta Intake and Pump Station – Conceptual Layout

The new levee configuration would consist of additional earthen fill placed about 1,000 to 1,200 feet longitudinally and 250 to 300 feet laterally on the land side of the existing levee. Sheet piles would also be longitudinally placed about 350 feet upstream and downstream of the new intake and would be integrated into the new setback levee to serve as a seepage barrier. Slope protection in the form of riprap would be installed on the water side of the existing levee for a distance of about 400 to 500 feet both upstream and downstream of the new intake. The new fill behind the existing levee would be constructed to maintain continuity of the existing road system along the existing levee crest. The elevation along the top of the new embankment fill and the existing embankment at the intake would be raised above the existing levee top elevation to account for anticipated sea level rise due to climate change. Erosion control measures such as hydroseeding would be used on the landward side of the new setback levee.

In-Water Construction Activities

In-water construction activities for installation of the fish screens for the new Delta Intake and Pump Station would be conducted either from a barge or from the top of the levee road. A sheet pile cofferdam would be installed in Old River to isolate the work area from the water and provide a means to conduct construction work in a dewatered environment. If excavation is required to prepare the cofferdam site, this excavated material would be contained within a designated containment area or areas on the land side of the levee. An earthen dike or siltation fences would enclose the containment area(s). Retention of the excavated materials would promote settling of the suspended sediments. After installation of the cofferdam, the water in the cofferdam enclosure would be pumped out and either disposed of on land or treated (as necessary) and discharged back to Old River. For installation of the fish screen, excavation would be required in Old River in an area of about 2,400 square feet to depths within 1 to 2 feet of the existing channel bottom.

Expansion of the Old River Intake and Pump Station (Alternative 3 Only)

Under Alternative 3 only, the existing 250-cfs Old River Intake and Pump Station would be expanded to its buildout capacity of 320 cfs. This would be done by replacing existing pumps with higher horsepower pumps, replacing steel plates in existing unused bays with state-of-the-art positive-barrier fish screens, and installing a second surge tank in the spot reserved for it next to the existing tank. All work would be conducted within the existing facility site. The additional capacity is needed because more water would be pumped to fill the expanded reservoir. There would be no excavation or other earthwork; the existing site is fully paved.

Operation and Maintenance of Intakes and Pump Stations

CCWD currently operates the Old River Intake and Pump Station (and AIP upon completion) remotely from CCWD Control at the Ralph D. Bollman Water Treatment Plant in Concord, but the facilities can be operated on site. The Expanded Old River Intake and Pump Station and new Delta Intake and Pump Station would generally be operated in the same manner. Under Alternatives 1 and 2, all three intakes for the Los Vaqueros Reservoir system could be operated simultaneously for a total combined capacity of up to 670 cfs. Currently, the combined diversion from the Old River

Intake and Pump Station and AIP is limited to 320 cfs by permit conditions. Under Alternatives 1 and 2, the intake operating permits would be modified to allow diversions from these two intakes up to the full 500 cfs capacity. The new Delta Intake and Pump Station would provide the remaining 170 cfs diversion capacity to achieve the full 670 cfs of Delta diversion capacity.

Under Alternative 3, the Expanded Old River Intake and Pump Station and AIP could be operated simultaneously for a total combined capacity of 570 cfs. For Alternative 4, operations of the Old River Intake and Pump Station and the AIP would remain the same, providing for combined diversion of up to 320 cfs.

Maintenance activities would generally include equipment inspections, preventive maintenance, and repair. Water quality monitoring and fish monitoring activities at the existing intakes would be expanded to include the new Delta Intake and Pump Station. Like the existing intakes, the new Delta Intake and Pump Station would be unstaffed and monitored via telemetry as well as through regular inspections.

3.5.3 Conveyance Facilities

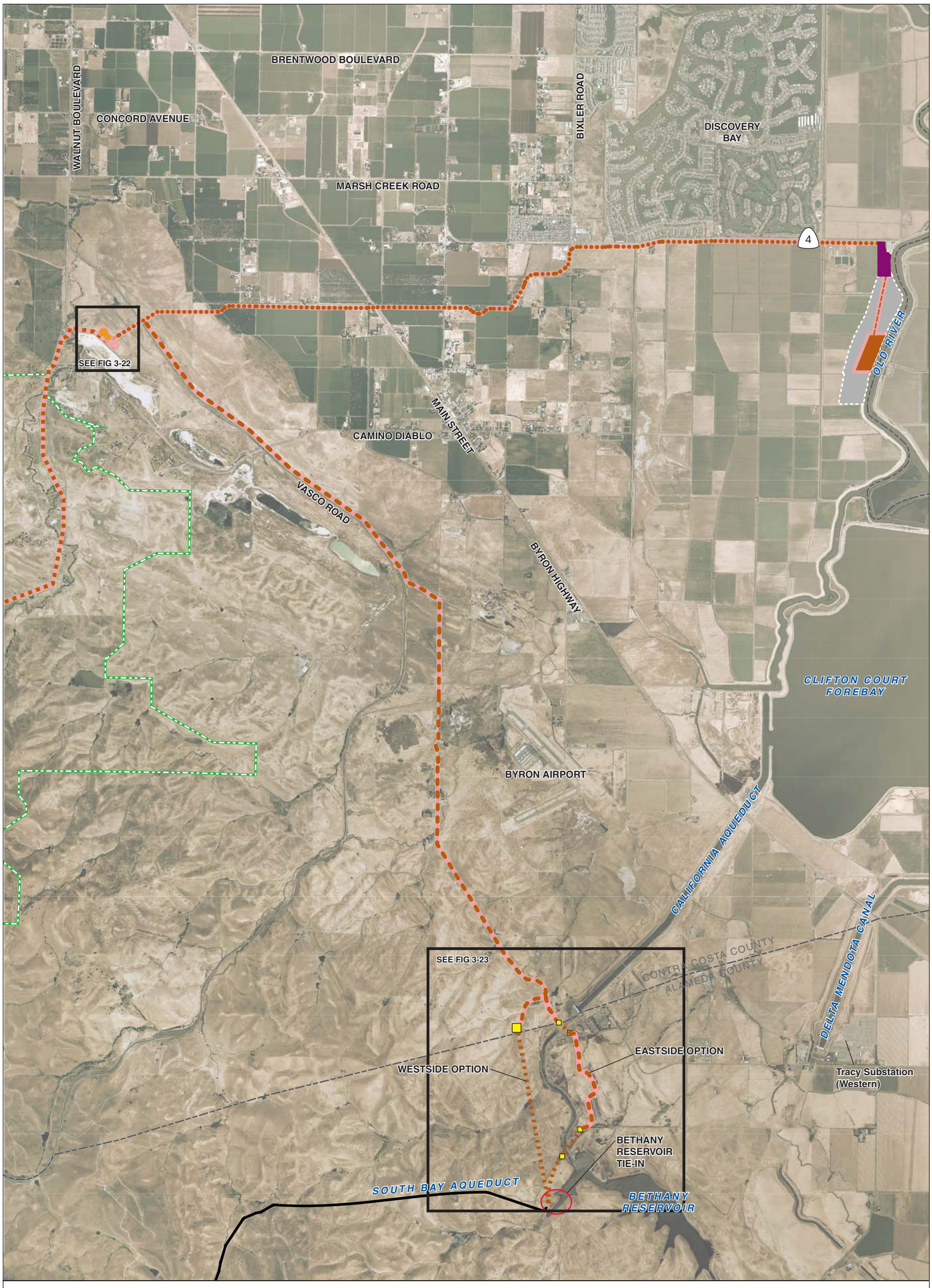
The existing conveyance system that moves water from the Delta to the existing Los Vaqueros Reservoir would be expanded in support of the 275-TAF reservoir under Alternatives 1, 2, and 3. This would involve construction of new pipelines generally parallel to the existing pipelines from the Delta intake to the Transfer Facility and from the Transfer Facility up to the reservoir and capacity expansion at the Transfer Facility. In addition, under Alternatives 1 and 2, a new conveyance pipeline would be constructed to provide a South Bay Connection linking the expanded Los Vaqueros Reservoir system to South Bay water agencies via Bethany Reservoir. Each of these conveyance facility projects is described in the following subsections. **Figure 3-21** presents an overview of the proposed conveyance facilities.

Under Alternative 4, no new conveyance pipelines would be constructed; the existing conveyance system would be used. The existing pumps at the Transfer Facility would be upgraded to provide more power to lift water into the 160-TAF expanded reservoir, but this upgrade would not involve facility or site modification.

The proposed conveyance facilities are described below followed by a discussion of construction activities for these facilities.

Delta-Transfer Pipeline

At present, water is diverted from the Delta at the Old River Intake and Pump Station and conveyed via the Old River Pipeline to the Transfer Facility. The Old River Pipeline generally traverses agricultural fields and orchards as it extends first in a westerly direction from the Old River Intake and Pump Station parallel to State Route 4 to the intersection of Bixler Road, then in a southwesterly direction for about 1 mile before continuing west to the Transfer Facility outside of Byron off Vasco Road. The Old River Pipeline is 34,700 feet long (about 6.5 miles) and 78 inches in diameter with a design capacity of 320 cfs. It is located 50 feet into an 85-foot permanent easement owned by CCWD.



SOURCE: USDA, 2006; and ESA, 2008

Figure 3-21
Overview of Conveyance Facilities

THIS PAGE INTENTIONALLY LEFT BLANK

Under Alternatives 1, 2, and 3, a new pipeline, the Delta-Transfer Pipeline, would be constructed between the new Delta Intake and Pump Station and the Transfer Facility. This pipeline would generally parallel the existing Old River Pipeline alignment within the existing Old River Pipeline permanent right-of-way for most of the route (see Figure 3-21). Under Alternatives 1 and 2, the pipe would be about 38,000 feet long, 96 inches in diameter and would be capable of conveying 350 cfs. Under Alternative 3, the pipeline would be about 34,700 feet long, 78 inches in diameter and would be capable of conveying 250 cfs. The pipeline for Alternatives 1 and 2 is longer than for Alternative 3 because it includes the connecting pipeline from the new Delta Intake and Pump Station to the Old River Intake and Pump Station.

Transfer Facility Expansion or Upgrade

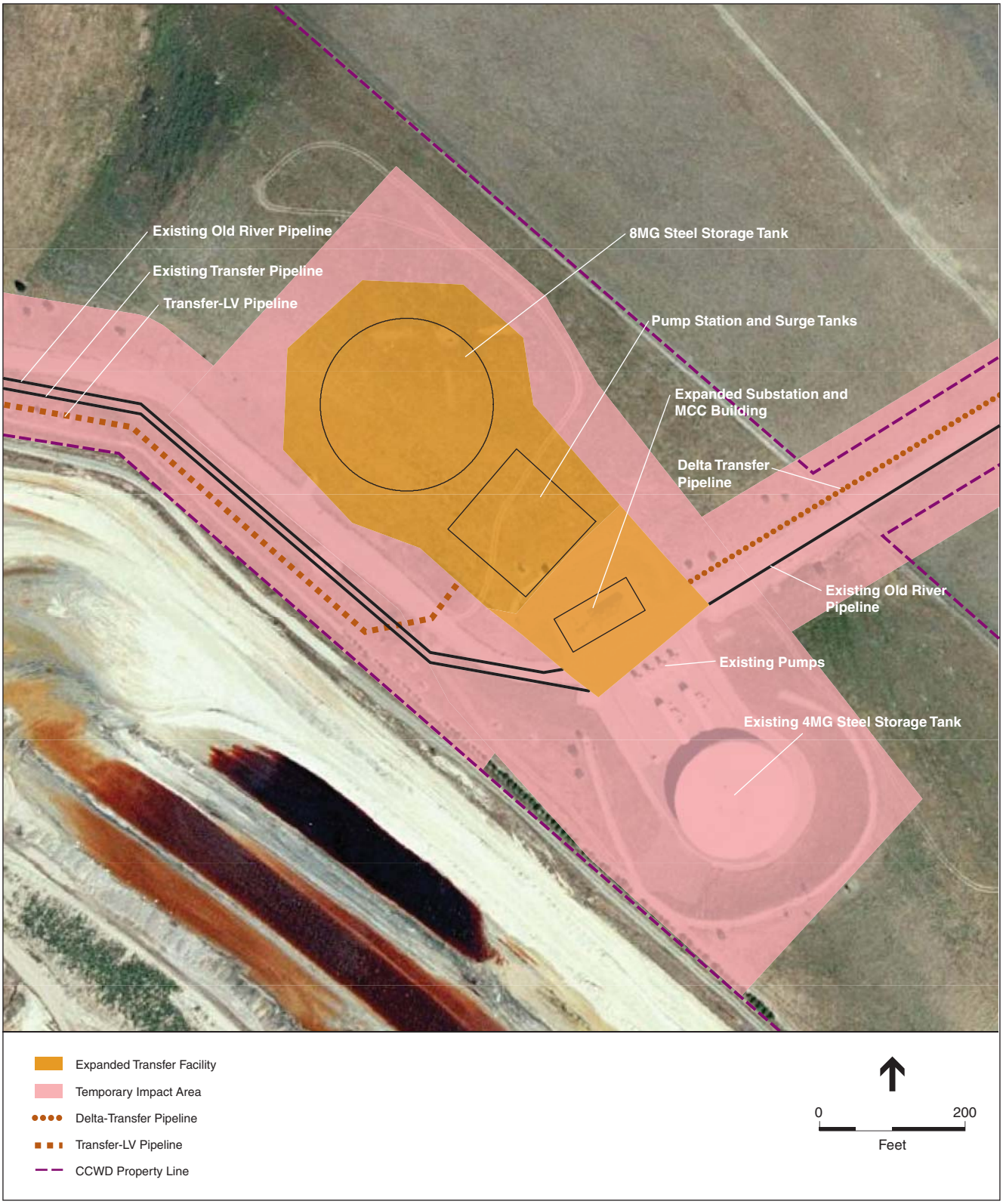
The Transfer Facility is the hub of the Los Vaqueros Reservoir system, regulating flows into and out of the Los Vaqueros Reservoir and into the Contra Costa Canal via the Los Vaqueros Pipeline. The Transfer Facility lifts water from the Old River Pipeline to the Los Vaqueros Reservoir. The existing Transfer Facility is on a fenced 24.3-acre site and is composed of a 4-MG steel storage tank, four 2,100-horsepower pumps capable of delivering 200 cfs up to the reservoir, a motor control building, and transformer yard. A flow control station is located outside this site adjacent to the Los Vaqueros Pipeline. The facility is about 2.75 miles west of Byron on Vasco Road between Camino Diablo and Walnut Boulevard. The steel storage tank is a reservoir to balance water movement through the system as operations change to allow reservoir filling and/or releases.

Alternatives 1, 2, and 3 would require expansion of the Transfer Facility to provide the capacity to move additional water to the expanded, higher reservoir. Under Alternatives 1 and 2, the existing 200 cfs capacity at the Transfer Facility would be expanded by 470 cfs for a total pumping capacity of 670 cfs. Under Alternative 3, capacity would be expanded by 370 cfs for a total pumping capacity of 570 cfs.

Expansion of this facility under Alternatives 1 through 3 would involve construction of a new pump station and modification of the existing pump station, an additional 8-MG steel storage tank to provide a total of 12 MG of storage, new surge tanks, and expansion of the existing motor control center building and transformer yard. The new facilities would be on the northern portion of CCWD-owned property, adjacent to the existing Transfer Facility, as shown on **Figure 3-22**.

For Alternatives 1, 2, and 3, about 270,000 cubic yards of material would need to be excavated for the new steel storage tank at the Transfer Facility. Concrete pouring and steel working activities would occur simultaneously with general construction activities for each new facility. The primary building materials would include structural steel, concrete, and masonry. Facilities would include electrical, hydraulic, and mechanical systems. Generally, excavated soils would be stored on site until used in grading or would be immediately removed from the site.

Under Alternative 4, there would be no new facilities, but the existing pumps would be upgraded to retain the current pumping capacity under the higher head of the expanded Los Vaqueros Reservoir. The upgrades would consist primarily of changing out electric pump motors and modifying the pumps. All work would be done within the existing footprint of the Transfer Facility.



SOURCE: GlobeXplorer, 2007; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-22
Expanded Transfer Facility

Transfer-LV Pipeline

At present, water is conveyed from the Transfer Facility either under gravity to the Contra Costa Canal via the Los Vaqueros Pipeline or pumped up to the Los Vaqueros Reservoir via the Transfer Pipeline. The Transfer Pipeline generally parallels an internal road at the Transfer Facility until it intersects with Walnut Boulevard, at which point the alignment continues south, paralleling Walnut Boulevard through the Kellogg Creek Valley, and continuing into the watershed until it connects to the inlet and outlet pipelines near the dam. The Transfer Pipeline is about 19,600 feet long (about 3.7 miles) and 72 inches in diameter. The Transfer Pipeline conveys water at a rate of up to 200 cfs from the Transfer Facility pumps to the Los Vaqueros Reservoir, and at a rate of up to 400 cfs from the Los Vaqueros Reservoir to the flow control station west of the Transfer Facility, then on to the Contra Costa Canal through the Los Vaqueros Pipeline. The Transfer Pipeline is located 50 feet into an 85-foot permanent easement (see Figure 3-21).

Under Alternatives 1, 2, and 3, an additional pipeline, the Transfer-LV Pipeline, would be installed to convey up to 670 cfs (570 cfs with Alternative 3) from the Transfer Facility to the expanded Los Vaqueros Reservoir and would also be used for release flows. The existing Transfer Pipeline would be used for releases only and would retain its existing capacity of up to 400 cfs. Additional filling capacity in this part of the conveyance system is needed because filling the larger reservoir during the limited period when water quality is sufficient requires a greater rate of flow than the current Transfer pumps and pipeline can deliver. Under Alternatives 1 and 2, the Transfer-LV Pipeline would be connected to the Transfer-Bethany Pipeline at the expanded Transfer Facility and used to convey water under gravity from the expanded Los Vaqueros Reservoir to Bethany Reservoir.

The new Transfer-LV Pipeline would generally parallel the existing Transfer Pipeline alignment (see Figure 3-21) within the existing Transfer Pipeline permanent easement right-of-way for a majority of the route. Under Alternatives 1 and 2, the additional pipeline could be up to 132 inches in diameter. Under Alternative 3, the new pipeline could be up to 120 inches in diameter.

Under Alternatives 1 and 2, energy recovery facilities would be constructed at the Expanded Transfer Facility to capture the excess energy generated when water is released from the expanded Los Vaqueros Reservoir and delivered to Bethany Reservoir via the Transfer-LV and Transfer-Bethany Pipelines.

Transfer-Bethany Pipeline (South Bay Connection)

Pipeline

The Transfer-Bethany Pipeline, a component of the South Bay Connection, would be a new pipeline constructed under Alternatives 1 and 2. The pipeline would connect with both the Delta-Transfer Pipeline and the Transfer Pipeline within the Transfer Facility site; however, the Transfer-Bethany Pipeline would not connect to the Transfer Facility itself (i.e., to the pumps or steel storage tanks). The Transfer-Bethany Pipeline would be as long as 8.9 miles (about 47,000 feet), up to 132 inches in diameter, and connected to the Delta-Transfer and Old River Pipelines at a point just east of the Transfer Facility. It would have the capacity to convey up to

470 cfs. Water would be conveyed through the Transfer-Bethany Pipeline to Bethany Reservoir for delivery to South Bay water agencies in one of the following three ways:

1. Water could be pumped from the Delta intakes (a combination of the new Delta Intake and Pump Station, Old River Intake and Pump Station, and/or AIP) to the Bethany Reservoir through the Old River and Delta-Transfer Pipelines to the Transfer-Bethany Pipeline.

2. Water could be released under gravity from the Expanded Los Vaqueros Reservoir to the Bethany Reservoir through the Transfer-LV Pipeline to the Transfer-Bethany Pipeline.

3. Water delivered via the Transfer-Bethany Pipeline could be a combination of water directly diverted from the Delta intake facilities and water released from the Expanded Los Vaqueros Reservoir.

From Bethany Reservoir, water delivered from the Expanded Los Vaqueros Reservoir could either be pumped into the SBA via the South Bay Pumping Plant, or could be transferred through the California Aqueduct (connected to the southern end of Bethany Reservoir) to the San Luis Reservoir for delivery to SCVWD, which obtains its CVP water through San Luis Reservoir.

As shown on Figure 3-21, the Transfer-Bethany Pipeline would start on the eastern side of Vasco Road near the Expanded Transfer Facility with a connection to the Delta-Transfer Pipeline and extend approximately 8.5 to 8.9 miles southeast to Bethany Reservoir. The alignment would extend southeast generally parallel to Vasco Road for about 3.9 miles to the corner of where Armstrong Road turns south. The pipeline would continue south along Armstrong Road for about 1.3 miles and then traverse southeast overland approximately 1.5 miles to a point close to the California Aqueduct. At this point, there are two options for the final southern segment of the pipeline to the Bethany Reservoir Tie-in: a Westside Option and an Eastside Option. As described below, both of these options include tunnel segments (see **Figure 3-23**).

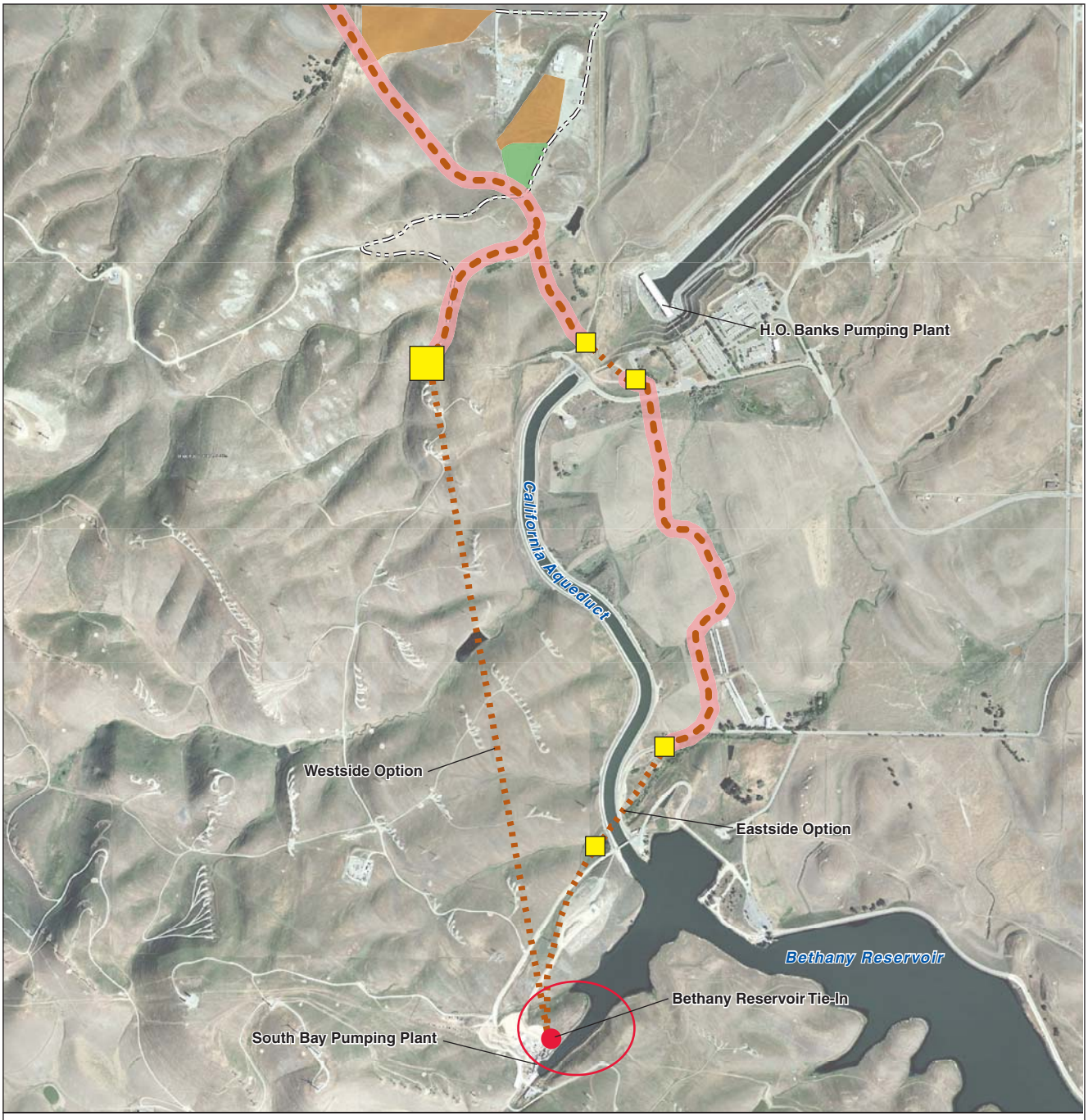
1. Westside Option (about 1.8 miles): the pipeline would continue an additional 0.4 mile south and then would be tunneled the last 1.4 miles to the Bethany Reservoir Tie-in. Tunneling this last segment would deal with the hilly terrain and maintain gravity flow to the Bethany Reservoir Tie-in.

2. Eastside Option (about 2.2 miles): the pipeline would continue about 0.4 mile towards the Banks Pumping Plant, then tunnel about 0.1 mile under the California Aqueduct, traverse south toward Bethany Reservoir for about 1.0 mile, to a final tunnel segment, about 0.7 mile, under the California Aqueduct to the Bethany Reservoir Tie-in.

Bethany Reservoir Tie-in

The South Bay Connection at Bethany Reservoir would include either an above-reservoir connection or a submerged connection.

With an above-reservoir connection, the tunnel section at the end of the Transfer-Bethany Pipeline would terminate at a portal on the slope above the Bethany Reservoir. A reinforced concrete energy-dissipating structure would be constructed from the portal down into the reservoir.



SOURCE: GlobeXplorer 2007; and ESA, 2008

Figure 3-23
Transfer-Bethany Pipeline
Alignment Detail

A section of the shore would need to be temporarily isolated behind a cofferdam to allow the dissipating structure to be completed below the reservoir surface. Construction at the reservoir could take up to one year to complete.

A submerged connection would include a vertical steel-lined shaft connecting the reservoir floor with the underlying Transfer-Bethany Pipeline tunnel. A barge and/or fixed platform installed in the water over the connection location would be used to drill the shaft and install the steel liner. To minimize impacts to water quality, a silt curtain and/or other measures would be used during in-water construction activities. The base of the steel liner would be closed off with removable bulkheads and the liner would be flooded to facilitate installation within the shaft. The liner would be secured to the shaft using concrete. Once the steel liner is in place, the tunnel would be mined to beneath the shaft and a permanent connection established. The tunnel would be flooded to equalize the pressure between the tunnel and steel-lined shaft, after which divers would remove the shaft bulkheads completing the connection to the Bethany Reservoir. Construction at the reservoir could take up to six months to complete.

Blow-Off and Air Valves – All Pipelines

Blow-off and air valves would be installed along the new pipelines proposed under Alternatives 1, 2, and 3. Blow-off valves and air valves are permanent release valves for water and air, respectively, used during pipeline filling and draining and during routine operations. Blow-off valves and air valves are installed at low points and high points, respectively. The actual locations of these valves would depend on the pipeline alignment; however, for purposes of this analysis, it is reasonable to assume that one air valve would be installed about every 1,000 feet and one blow-off valve every 2,000 feet. The valve structures have a concrete base with a medium diameter pipe extending about 2 feet above the base for a total height of about 2 to 4 feet above the ground. **Figure 3-24** shows an existing air release valve on the Old River Pipeline that is typical of what the new valve structures would look like.

Construction

Pipelines

Project pipelines would be constructed throughout the full 36-month estimated project construction period. However, any given segment of pipeline would be in active construction for a much more limited period. For purposes of the impact analysis in this document, it is assumed that pipeline construction proceeds at a pace of about 120 feet per day for open trench construction and at a reduced pace for tunneling or boring and jacking.

The temporary construction easement for the Delta-Transfer Pipeline and the Transfer-LV Pipeline was assumed to be 200 feet wide, and the Transfer-Bethany Pipeline to be 300 feet wide for purposes of environmental impact analysis. The actual construction area used would be narrower in some places due to environmental constraints (e.g., to avoid wetlands), physical conditions, or landowner issues. The minimum right-of-way for construction would be 85 feet wide, except on the Transfer-Bethany Pipeline along Armstrong Road where the work area could be restricted further to minimize impacts to vernal pool fairy shrimp habitat.

SOURCE: CCWD, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-24
Existing Valve Structure

Pipeline materials (e.g., piping, backfill material) would be stored along the pipeline route within the construction easement. The active work area would generally be 25 to 50 feet on both sides of the trench.

Where either the Delta-Transfer Pipeline or Transfer-LV Pipeline is installed within the existing permanent right-of-way for the Old River Pipeline or Transfer Pipeline, respectively, an additional permanent easement would not be necessary. Where these pipelines are not within that existing easement area, a new permanent 85-foot-wide easement would be acquired. For the new Transfer-Bethany Pipeline, it is assumed that CCWD would acquire a permanent 85-foot-wide easement.

Open-trench construction methods would be used for most pipeline installation, and bore-and-jack methods would be used for crossings where trenching methods are not feasible or where restrictions warrant other construction methods (e.g., major roadways and intersections, railroad lines, flood control channels). The as-built surface elevation would generally match the original ground surface elevation. **Figure 3-25** shows a schematic view of pipeline construction activities.

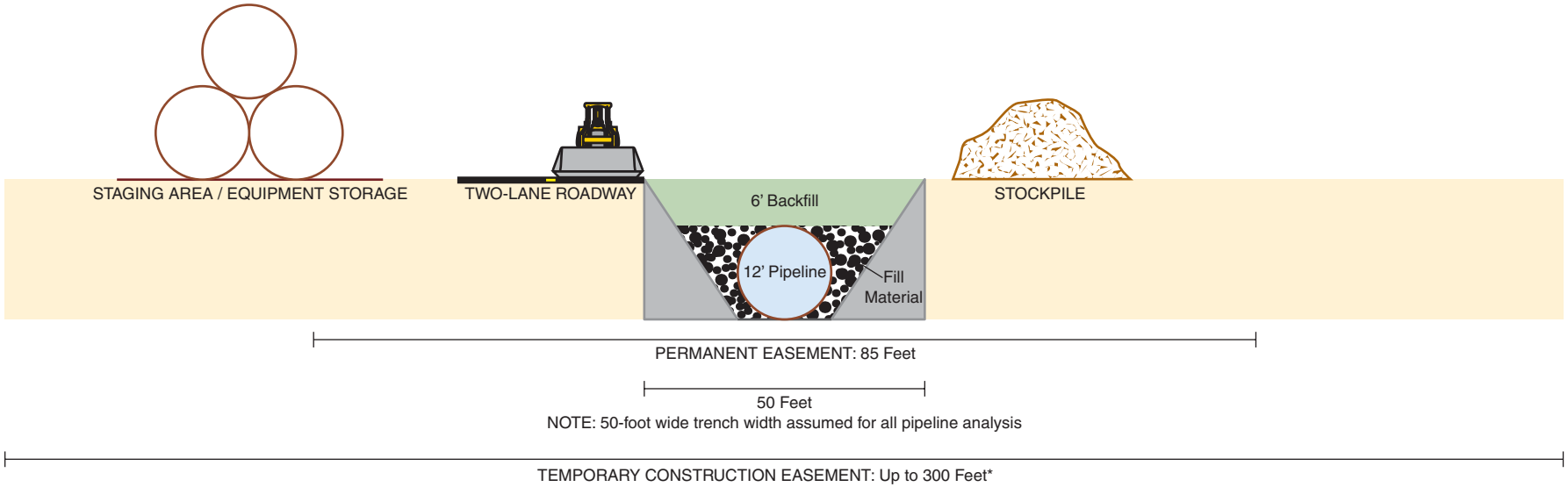
Open Trench

The trench width for the conveyance pipeline installation would range from 35 to 70 feet; trench depth would range from 15 to 55 feet, depending on the size of the pipeline being installed but would typically be 20 feet. Where required for safety, trenches would be braced with a trench box or shoring. The active work area along the open trench would generally extend about 25 to 50 feet to both sides of the trench. The construction right-of-way would range from about 85 feet to 200 feet wide.

Staging areas would be set up along the pipeline alignment, and construction equipment and other materials would be located at selected locations to facilitate the movement of materials, equipment, and construction crews. Staging areas would be selected to minimize hauling distances and long-term disruption and avoid sensitive environmental resources that may be present. Imported backfill would be delivered to stockpiles near the open trench. When the new pipeline is in place, backfill would be placed in the trench. Minimum soil coverage is generally about 5 to 6 feet.

Boring and Jacking

Bore-and-jack construction techniques may be used at some locations to avoid significant impacts such as at crossings of flood control channels, major roadways, railroads, wetlands, and other environmentally sensitive locations including known cultural resources within the Delta-Transfer pipeline corridor. The bore-and-jack method involves using a horizontal boring machine or auger to drill a hole and a hydraulic jack to push a casing through the hole. As the boring proceeds, a steel casing pipe is jacked into the hole; the pipeline is then installed in the casing. The casing is pushed using a large hydraulic jack in a pit at one end of the crossing. In some cases, the pits would extend below the water table, requiring the use of sheetpiles and dewatering pumps. Bore-and-jack undercrossings below the water table would require enclosure of the jacking pits with sheetpiles and special bulkheads at the jacking portals. Water from dewatering operations would be disposed of in accordance with applicable state and local requirements.



NOT TO SCALE

* 300 feet for Transfer-Bethany Pipeline only
Up to 200 feet for Delta-Transfer and Transfer-LV Pipelines

SOURCE: ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-25
Pipeline Construction Schematic

Dewatering

Dewatering during pipeline construction would be accomplished with a trench sump and an engine-driven dewatering pump on an as-needed basis, depending on groundwater conditions during construction. Pit sumps, groundwater wells, or a combination of both may be used to dewater the excavation. The water would be disposed of in accordance with applicable requirements.

If needed for the operation of pipeline sending and receiving pits, dewatering wells may be constructed to adequately dewater the construction area. Groundwater would be treated similarly to that encountered during open-trench construction. Post-construction, the dewatering wells would be capped and abandoned in compliance with applicable requirements.

Tunneling

For the Westside Option of the Transfer-Bethany Pipeline, the approximate location of the tunnel entry portal would be at the Alameda County line. The pipeline would be tunneled directly to the Bethany Reservoir Tie-in, either to an exit portal above Bethany Reservoir for the above-reservoir connection or into Bethany Reservoir for the submerged connection. See Figure 3-23. The tunnel entry portal site would be about 3 acres. Access to the site would be via an existing gravel road, about 35 feet wide, which begins at the terminus of Byron Hot Springs Road and heads south past a large gravel pad before it traverses westward. Approximately 2,000 feet past the existing gravel pad, the access road makes a hairpin turn and traverses down a hill. From the bottom of the hill, a new 1,150-foot long temporary access road would be installed to the entry portal site. The existing access road may need to be widened in some locations to maintain a 35-foot width. Access to the site of the Bethany Reservoir Tie-in would be via existing access roads in and around the Bethany Reservoir.

For the Eastside Option, the pipeline would include two short tunnel segments under the California Aqueduct. Access to the tunnel portals would be via existing roads. Modification/widening of these roads might be required.

The 12-foot tunnels would be constructed using a tunnel-boring machine, road-header machine, or conventional drill and blast methods. Diesel generators would be required. For the Eastside Option, the northern 700-foot-long tunnel entry and exit portals would be approximately 1,800 square feet (i.e., 30 by 60 feet). For the southern, approximately 4,000-foot-long tunnel, the exit portal, on the eastern side of the California Aqueduct would be approximately 1,800 square feet (i.e., 30 by 60 feet); however, the entry portal area would be approximately 1 acre to accommodate the tunnel boring, excavation equipment, pipeline and materials storage, pipeline connectors, and temporary parking for crews, trucks, and other requirements.

The construction of the Westside Option would create up to 60,000 cubic yards of waste rock and tunnel spoils, and the Eastside Option would create about 35,000 cubic yards of waste rock and tunnel spoils. The spoils would be hauled from the tunnel face for temporary onsite storage and/or subsequent, final disposal. Larger waste rock and tunnel muck would be disposed at three potential locations: at two designated disposal areas occupying up to 22 acres near the terminus of Byron Hot Springs Road or along project access roads where it would be consolidated and used as a

roadway sub-base or surface. Assuming an average depth of 3 feet, the tunnel spoils could be used for roadway sub-base on about 50,000 feet of project access road.

The designated disposal area would be designed to promote surface water drainage and minimize ponding or standing water. Soil would be imported or retained during site excavation to cap the tunnel spoils and promote revegetation.

Staging and Disposal Areas. An approximately 4.5-acre existing gravel pad near the terminus of Byron Hot Springs Road would be used as a staging area for the trench and tunnel activities under either option. The site would be used to accommodate the tunnel excavation equipment, pipeline, and other materials storage as well as temporary parking for crews, trucks, and other equipment. Two spoil disposal areas, totaling approximately 22 acres, have been sited near the terminus of Byron Hot Springs Road for disposal of tunnel waste rock and spoils.

Operation and Maintenance of Conveyance Facilities

The conveyance facilities would normally be operated remotely from CCWD Control at the Ralph D. Bollman Water Treatment Plant although the pumps, valves, and blow-offs could be operated manually as well. Maintenance activities include routine inspection of pipelines and other equipment, preventive maintenance, and repairs.

3.5.4 Power Supply Infrastructure

Under Alternatives 1, 2, and 3, expansion of the Los Vaqueros Reservoir system would require additional electrical power supply. Alternative 4 would not require additional power supply.

CCWD's existing Old River Intake and Pump Station and the AIP receive power supply from Western. Western owns a double-circuit, 230-kV transmission line that extends from its Tracy substation adjacent to the CVP's Jones Pumping Plant facilities, into the project area. Western is currently operating the 230-kV line at 69 kV. This existing transmission line runs parallel to two PG&E 500-kV circuits. CCWD's existing Transfer Facility receives electrical power supply from PG&E via an existing 230-kV transmission line that extends from the PG&E Brentwood Substation.

The existing infrastructure supplying power to the Old River Intake and Pump Station and AIP has insufficient capacity to meet the peak power needed at the new Delta Intake and Pump Station under Alternatives 1 and 2, or at the Expanded Old River Intake and Pump Station under Alternative 3. Additionally, based on preliminary discussions with PG&E, it is anticipated that the Brentwood Substation would be unable to meet the increased peak power loads for the Expanded Transfer Facility under Alternatives 1, 2, and 3. Two options have been identified for constructing power infrastructure to provide additional power supply to these facilities for Alternatives 1, 2, and 3.

Power Option 1: Western Only

Under this option, Western would provide all the additional electrical power required for the expanded Los Vaqueros Reservoir system. For Alternatives 1 and 2, Western would supply additional power to both the new Delta Intake and Pump Station and the Expanded Transfer Facility. For Alternative 3, Western would supply additional power to both the Expanded Old River Intake and Pump Station and the Expanded Transfer Facility.

Delta Intakes

Western would use its existing 230-kV transmission line from the Tracy substation to supply power to a new substation. The new substation site would require approximately 2 acres near the terminus of Camino Diablo Road and would need to have the capacity to step power down from 230 kV to 69 kV and 21 kV. The exact location for the new substation has not been determined; therefore, a siting zone has been defined for purposes of this impacts analysis. **Figure 3-26** shows the proposed alignment and substation site for the power supply option. It is assumed that permanent impacts would not exceed 2 acres for the facility and that a permanent access road to the facility most likely from Camino Diablo Road or another auxiliary road would be required. Landscaping, lighting, and site security plans would be developed and implemented consistent with Western's requirements.

From the new substation, the existing single-circuit, 69-kV powerline to the Old River Intake and Pump Station would be upgraded, replaced, or have an additional line added by one of the following methods: (1) placing new insulator arms and adding a second 69-kV circuit on the existing poles; (2) replacing the existing pole with a new pole to accommodate a double-circuit, 69-kV line; or (3) installing a new 69-kV line parallel to the existing line.

Expanded Transfer Facility

For the Expanded Transfer Facility, a new 21-kV distribution line would be installed from the new substation, paralleling the existing 230-kV transmission line until it intersects with the Delta-Transfer Pipeline alignment. At that point, the new powerline would head westward, generally traversing the same alignment as the Delta-Transfer Pipeline to the Expanded Transfer Facility. For new 69-kV circuits and 21-kV distribution circuits, it is assumed that if new poles are required, they would be about 50 feet tall and installed in up to 300-foot spans.

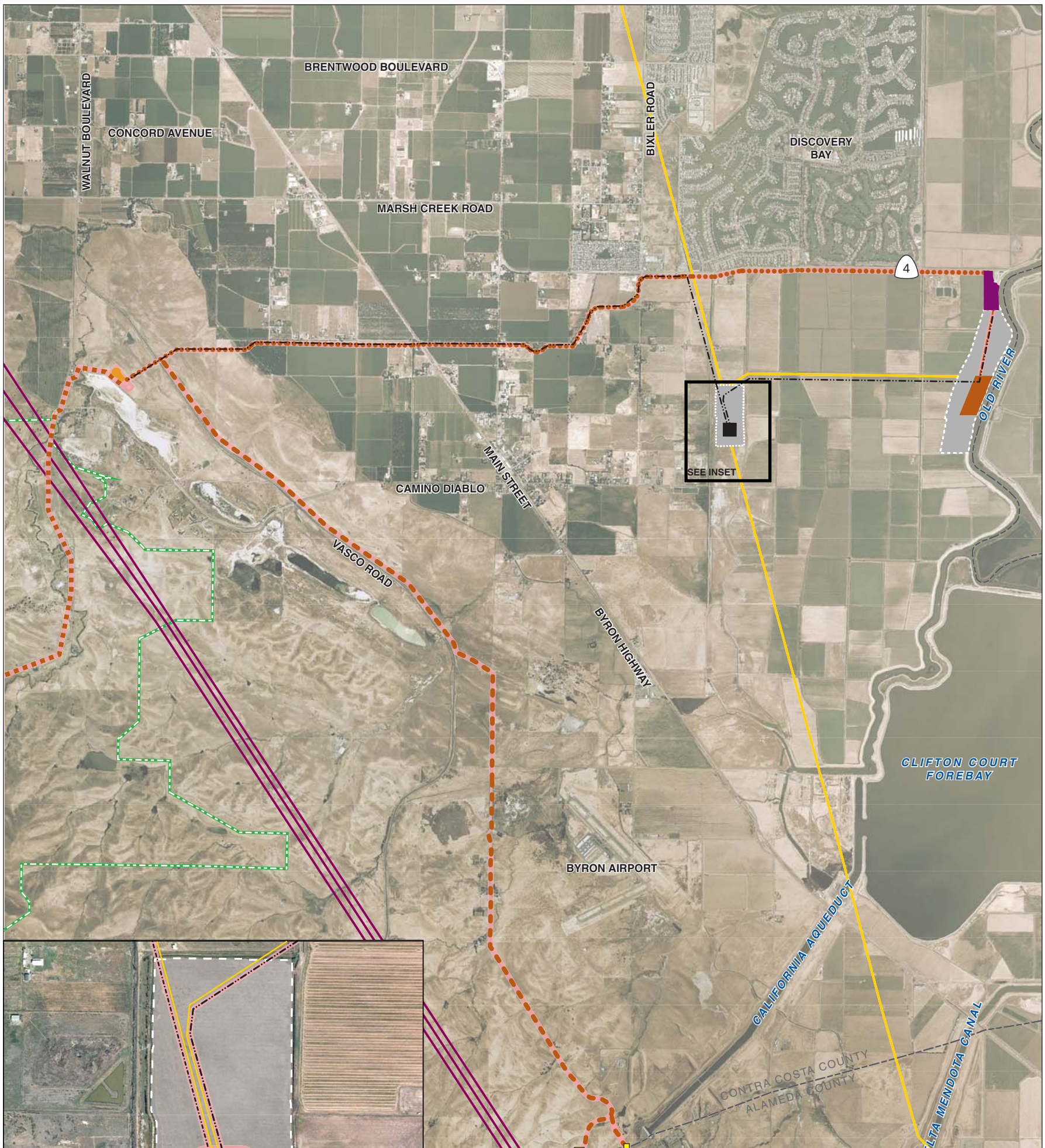
Power Option 2: Western & PG&E

Under this power option, Western would provide the additional electrical power supply for either the new Delta Intake and Pump Station (Alternatives 1 and 2) or the Expanded Old River Pump Station (Alternative 3), but PG&E would provide the additional electrical power supply to the Expanded Transfer Facility (Alternatives 1, 2, and 3) (see **Figure 3-27**).

Delta Intakes

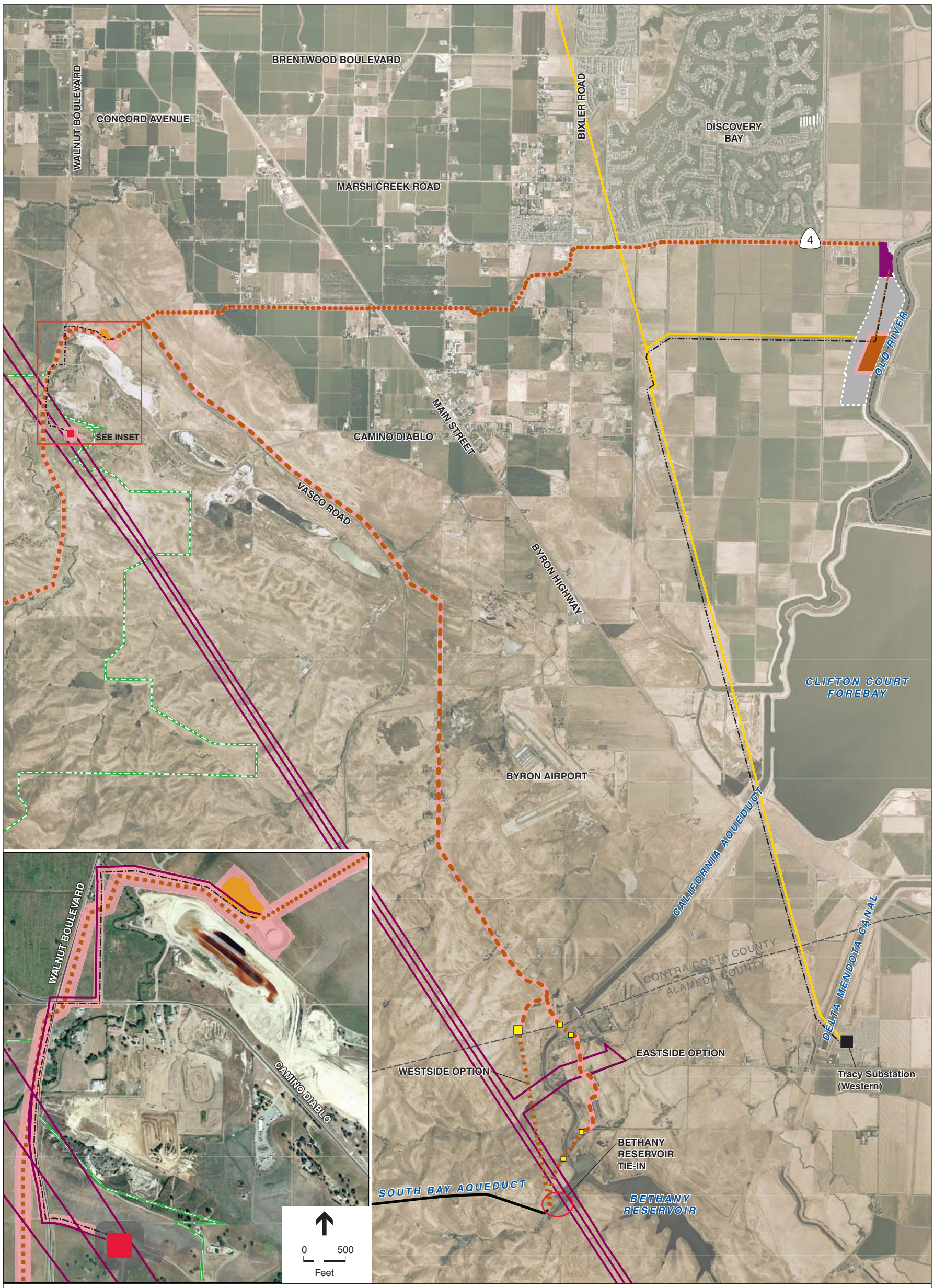
Western would use its existing 230-kV transmission line corridor from the Tracy substation to supply power to the Delta intakes by constructing a single-circuit, 69-kV powerline to the terminus

This page intentionally left blank



SOURCE: USDA, 2006; and ESA, 2008

Figure 3-26
Power Supply Option 1 – Western Only



SOURCE: USDA, 2006; and ESA, 2008

Figure 3-27
Power Supply Option 2 – PG&E and Western

THIS PAGE INTENTIONALLY LEFT BLANK

of the existing single-circuit, 69-kV line that currently supplies power to the Old River Intake and Pump Station. From that point, the existing single-circuit, 69-kV powerline would be upgraded, replaced, or have an additional line added by one of the following methods: (1) placing new insulator arms and adding a second 69-kV circuit on the existing poles; (2) replacing the existing pole with a new pole to accommodate a double-circuit, 69-kV line; or (3) installing a new 69-kV line parallel to the existing line. There would be no new Western substation under Power Option 2.

Expanded Transfer Facility

PG&E would provide power to the Expanded Transfer Facility through a new PG&E distribution substation constructed in the Los Vaqueros Watershed, as shown on Figure 3-27. The new substation would have the capacity to step power down from the existing 230-kV PG&E transmission line to a 21-kV powerline. The substation would require about 2 acres and would be enclosed with fencing. The tallest element, the powerline poles, would be about 50 feet tall. The site for this new substation was selected to minimize visual impacts by using natural topography to obscure views of the facility, creating visual screening. A landscaping plan to provide additional visual screening and a lighting plan to provide security and exterior lighting would also be developed.

The approximately 1.5-mile-long 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 the route of PG&E's existing 21-kV distribution line serving the Transfer Facility, which runs west, crosses Walnut Boulevard, heads north paralleling Walnut Boulevard to the intersection of Camino Diablo Road, crosses Walnut Boulevard and traverses east on the south side of Camino Diablo, crosses Camino Diablo Road and traverses north on the west side of Longwell Avenue, crosses Kellogg Creek and traverses on the north side of an existing access road on the Expanded Transfer Facility property. This alignment is shown in the inset on Figure 3-27.

The existing 21-kV distribution line described in the preceding paragraph would be upgraded by one of the following methods: (1) placement of new insulator arms and additional conductors on the existing poles; (2) pole for pole replacement of the existing distribution line and co-location of existing distribution on the new poles; or (3) installation of a new distribution line paralleling the existing distribution line. If new poles were required, they would be about 50 feet tall and installed in increments of 200 to 300 feet apart.

Construction

For purposes of this Draft EIS/EIR, construction impacts for the proposed power/distribution line were based on installation of new 18-inch poles, disposal of old poles and the siting of the new alignment parallel to an existing alignment to fully encompass the maximum ground disturbance, waste disposal, and visual impacts anticipated.

For both the proposed Western power facilities and the PG&E power facilities, access to and from the power/distribution line corridors and substation locations would generally be from existing roadways within the project area. Depending on the final site locations for the substations, some overland access may be required.

Power/Distribution Lines

Typical construction sequencing for both the Western powerline and the PG&E distribution line would include vegetation removal at the pole site, auguring the pole holes, setting the framed poles, backfilling as necessary, and stringing the overhead distribution lines. Pole removal would consist of loosening, removing, and disposing of the pole in accordance with Contra Costa County regulations.

Installation of the conductors would require pull and tension sites as well as work areas within the construction corridor and/or right of way. Pull and tension sites could temporarily disturb approximately 6,250 square feet per site (assumed 125 feet by 50 feet). Pull and tension sites would be sited during final design. They would be within the exiting right-of-way, would be sited to avoid sensitive resources, and would be restored to preconstruction conditions at the commencement of construction. Work areas would be limited to 25 feet on either side of centerline for installation of the new power/distribution line and would also be sited to avoid sensitive resources.

Substations

Typical construction methods for the proposed substations would include vegetation removal, grading, excavation, and construction of subsurface footings and concrete slabs for aboveground structure and equipment. Aboveground structures, including steel bus support racks, high voltage breakers, power transformers, and switchgear and communication equipment would be installed.

Construction Workforce and Schedule

Construction would require several work crews, including Western and/or PG&E personnel as well as contracted construction personnel. The total number of construction crew members is estimated to be up to 25. It is expected that crews would work concurrently; however, the actual deployment of crews depends on the timing of project approval and other factors. The construction period would last about eight to ten months for either substation and about three to six months for the distribution line.

Operations and Maintenance of Power Facilities

The proposed electrical power facilities would be controlled by PG&E and/or Western, as appropriate. A control center in the vicinity of the project would control operations remotely via station and line alarms connected by phone line. Western and/or PG&E would conduct regular and or emergency inspection of their electric lines, support systems, and instrumentation and controls. Trimming of landscaping trees would be conducted in accordance with Western Orders or the California Public Utilities Commission General Order 95, as appropriate. For the proposed substation facilities, permanent parking for facility inspections, operations, and maintenance would be entirely within the substation site or on the access road at the entrance to the substation site.

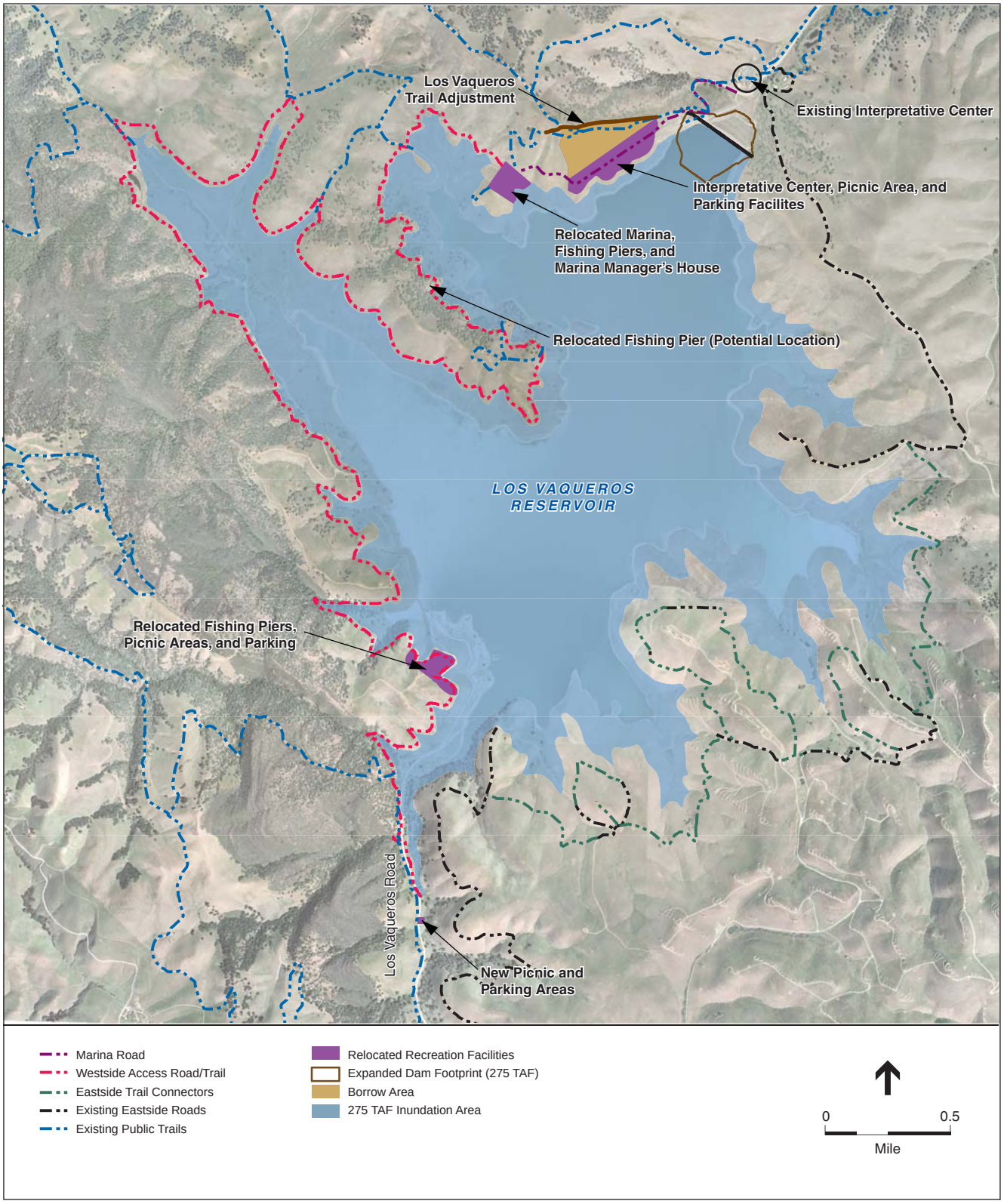
3.5.5 Recreational Facilities

Recreational facilities are included in each of the project alternatives to replace the recreational facilities that would be displaced by reservoir expansion and, in some cases, to enhance recreational opportunities. **Table 3-5** indicates the recreational facilities that would be affected within the proposed 275-TAF and 160-TAF reservoir inundation areas. **Figure 3-28** shows the existing recreational facilities affected by expanding the Los Vaqueros Reservoir to 275 TAF and also shows the proposed relocation areas for these facilities, which include: shoreline hiking trails, Marina facility, fishing piers, and parking and picnic areas. Proposed recreational enhancements for Alternatives 1, 2, and 3 include additional fishing access areas, trails, and an expanded Marina complex to include an additional interpretive center and more berths for rental boats.

TABLE 3-5
RECREATIONAL FACILITIES AFFECTED BY INUNDATION FROM RESERVOIR EXPANSION TO 275 TAF OR 160 TAF

	Parking Spaces	Toilets	Display Panel / Water Station	Picnic Tables	BBQ Units	Fishing Piers	Miscellaneous Facilities
Dam Area	–	1	–	–	–	1	Fishing pier (southwest of dam)
Los Vaqueros Staging Area	61	2	1	–	–	1	Ramp to fishing pier that complies with the Americans with Disabilities Act
Oak Point Picnic Area	–	–	–	7	3	1	Fishing pier
Marina	59	6	–	6	–	–	Marina building, fish-cleaning station, outdoor amphitheater, pay phone, drinking fountain, Marina Manager's residence
Knoll Picnic Area	21	1	–	18	9	–	
Northwest Cove	–	1	–	–	–	1	Fishing pier
Hiking-Only Trails	–	–	–	–	–	–	275 TAF: 8.1 miles (portions of Peninsula, Adobe, Canada, Oak Savannah and Los Vaqueros trails) 160 TAF: 5.96 miles (portions of Peninsula, Adobe, Oak Savannah and Los Vaqueros trails)
Recreation Access Roads	–	–	–	–	–	–	275 TAF: 2.25 miles of road 160 TAF: 0.93 miles of road
Service Roads	–	–	–	–	–	–	275 TAF: 12.5 miles of road 160 TAF: 5.22 miles of road
Total	141	11	1	31	12	4	
Percent Affected	43%	56%	20%	56%	44%	100%	275 TAF: 15% of trails 160 TAF: 11% of trails

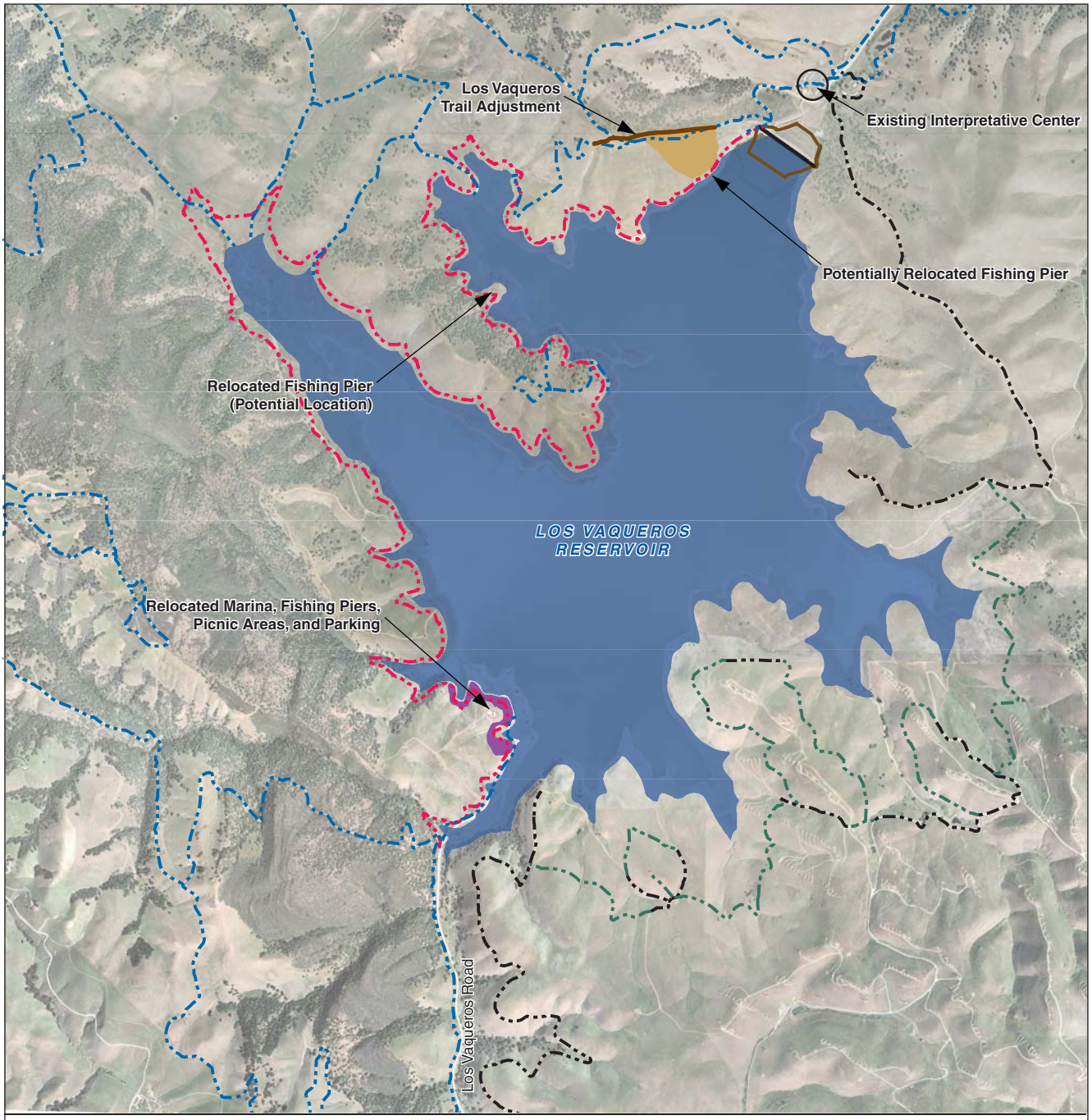
Figure 3-29 illustrates the existing recreational facilities affected by expanding the Los Vaqueros Reservoir to 160 TAF and the proposed site for relocation of the Marina facility, fishing piers, and parking and picnic areas. Proposed recreation enhancements for Alternative 4 include additional trails, picnic areas and potentially an additional fishing pier.



SOURCE: GlobeXplorer, 2007; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-28
Proposed Recreation Facilities –
275 TAF Reservoir Expansion
Alternatives 1, 2, and 3



SOURCE: GlobeXplorer, 2007; and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 3-29
Proposed Recreation Facilities –
160 TAF Reservoir Expansion
Alternative 4

Marina Complex

The existing Marina includes the following facilities that would be affected by expanding the Los Vaqueros Reservoir to 275 TAF under Alternatives 1, 2, and 3.

- A series of docks (30 feet by 16 feet) for 30 aluminum electric-powered boats and two 18-foot pontoon boats
- A small dock with boat service equipment
- Parking for 59 cars
- Flush restrooms
- Picnic tables
- A Marina building with outdoor amphitheater
- Miscellaneous facilities such as a fish-cleaning station, a pay phone, and drinking fountain
- A residence for the Marina Manager
- Boat house for water quality sampling boat

Under Alternatives 1, 2 and 3, the Marina would be relocated from the southern end of the reservoir to the northern end of the reservoir near the dam. The new Marina Complex would replace the existing Marina facilities and would provide additional or expanded facilities as well. The new Marina Complex would be compliant with the Americans with Disabilities Act (ADA). An interpretative center, outdoor amphitheater, picnic tables, parking, and miscellaneous facilities would be built next to the dam. Farther west, the Marina Manager's residence, Marina building, fishing piers, fish cleaning station, and docks with covered berths for three boats for rescue and water quality sampling would be constructed. Berths for 50 electric-powered rental boats and two pontoon boats would also be available. Solar panels would be incorporated into the roofing of the Marina Complex and new interpretive center.

Most of the Marina Complex would be built next to the site of the dam material borrow area. A flat area of about 11 acres (about 280 feet wide by 2,100 feet long) would be created on the borrow area site near the dam. Once borrow materials have been excavated from this site, it would be graded to accommodate a new, second interpretive center, amphitheater, parking, staging, and picnic areas.

The new Marina Complex would be accessed from a new road about 1 mile long, constructed over the top of the raised dam, and extended westward to the facilities.

An additional 5-acre flat area would be graded due west to accommodate the Marina Manager's residence, Marina building, docks, fishing piers, picnic area, and parking. Excess material would be disposed of within the reservoir prior to filling. Movable floating docks would be constructed to allow boat access for a range of reservoir surface elevations.

Under Alternative 4, with a 160-TAF reservoir, the Marina would remain at the southern end of the reservoir, but it would be relocated upslope to accommodate the higher water level.

Interpretive Center

Under all alternatives, construction activities in the vicinity of the existing interpretive center would require that the facility be closed during the construction period. During construction, the interpretive center parking could be used for worker parking, minor staging, and/or materials

and equipment storage. Upon completion of construction, the existing interpretive center would be reopened to the public. As indicated above, a new, second interpretive center would be constructed west of the dam in the Marina Complex for Alternatives 1, 2, and 3.

Fishing Piers

Expanding the Los Vaqueros Reservoir to 275 TAF under Alternatives 1, 2, and 3 would require the relocation of four fishing piers. The piers include the ADA-compliant fishing pier at the Los Vaqueros staging area that provides access to the Marina and boating facilities, as well as the pier near the dam, the pier in Peninsula Cove, and the piers at the Oak Point Picnic Area (see the next subsection). Some of these piers are associated with staging and picnic areas and share parking with these facilities. The four piers would generally be relocated upslope of their current location around the perimeter of the expanded reservoir. ADA-compliant access would be maintained at the new Marina Complex. The addition of a new, fifth fishing pier is also proposed under Alternatives 1, 2, and 3 (see Figure 3-28). This pier is proposed on the peninsula south of the relocated Marina. To facilitate fishing at the southern end of the reservoir, a fish cleaning station and bait shop are proposed.

The same four fishing piers would need to be relocated under Alternative 4. Proposed locations for replacement piers would generally be upslope of the existing fishing piers. An additional fishing pier could potentially be installed under Alternative 4 (see Figure 3-29) as well.

Day-Use Facilities

Expanding the Los Vaqueros Reservoir under all alternatives would inundate the day-use facilities at the Los Vaqueros staging area (61 parking places, 2 toilets), the Oak Point Picnic Area (7 picnic tables), and the Knoll Picnic Area (21 parking places, 1 toilet and 18 picnic tables). For Alternatives 1, 2, and 3 (with an expansion to 275 TAF), one replacement picnic area would be placed at the new Marina Complex and a second would be placed at the fishing pier on the peninsula south of the new Marina facility. A third picnic area would be established at the new parking area, and hiking trail access would be provided at the southern end of the reservoir, as shown in Figure 3-28.

The picnic areas at the Marina Complex and the south-end access area would be ADA-compliant. These picnic areas would provide similar or improved picnicking opportunities as the three displaced by inundation.

For Alternative 4 with an expansion to 160 TAF, replacement facilities would be generally upslope of the existing facilities.

User Parking

Under Alternatives 1, 2, and 3, parking would be provided at the Marina Complex, the westside trail access point, and the southern end of the reservoir. Overall, a similar number of parking spaces would be provided as at the existing reservoir recreation areas. Under Alternative 4, parking would be provided generally upslope of the existing parking areas.

Access Roads

Under Alternatives 1, 2, and 3, about 2.25 miles of paved access road to the existing Marina would be inundated. No other recreational access roadways would be affected.

A total of 12.5 miles of an unpaved, non-public, all-weather service road along the western shoreline would also be inundated and require relocation to provide access to the western area of the watershed for fire prevention and suppression activities, public safety, and environmental compliance. This westside access road would remain closed to the public.

Under Alternative 4, just less than 1 mile of paved access road to the existing Marina would be inundated along with just over 5 miles of the unpaved westside access road. These roadway segments would be relocated along the perimeter of the expanded reservoir.

Hiking Trails

Under Alternatives 1, 2, and 3, about 8.1 miles of the existing Los Vaqueros, Peninsula, Canada, Adobe, and Oak Savannah Trails (hiking only) would be inundated in the northwestern portion of the reservoir. Due to steep topography and hot, windy climate, the hiking trails are lightly used. About 15.5 miles of replacement hiking trails would be installed to provide expanded access to the same areas and recreational experiences as were available before the reservoir expansion. Comparable reservoir and landscape views would be preserved. Trail connectivity with regional trails in the East Bay Regional Park District's Morgan Territory and Round Valley Regional Preserves would be maintained. **Table 3-6** shows the length of trails that would be inundated by either a 275-TAF reservoir or a 160-TAF reservoir and the proposed replacement trails.

Southern access to the westside trail would be available from Los Vaqueros Road (off Vasco Road). An optional eastside trail could be constructed along the southeastern portion of the reservoir, connecting existing access roads (used to access wind power facilities) in the southern and eastern portions of the watershed. A new park bench would be installed along the eastside trail at a lookout point. A parking lot would be built near the upper inundation limit and would provide direct access to the trailhead. The site would have picnic tables, toilets, and a water station.

Under Alternative 4, about 6 miles of the existing Los Vaqueros, Peninsula, Adobe, and Oak Savannah Trails (hiking only) would be inundated in the northwestern portion of the reservoir and would be replaced. The Canada Trail would not be affected under this alternative. An optional eastside trail could be constructed as part of Alternative 4 as well.

Recreational Fisheries Management

When the expanded reservoir resumes operation, CCWD will restock the reservoir with fish. An enlarged reservoir would be capable of maintaining colder temperatures than the current reservoir, and habitat for coldwater fish species would increase substantially. Habitat for warm-water fish would also increase, as the greater reservoir shoreline would provide additional shallow spawning areas. The restocked fish populations would not immediately provide anglers with the same fishing experience because it could take up to three years for fish populations to increase to current levels.

TABLE 3-6
POTENTIAL REPLACEMENT TRAILS AND RECREATION/SERVICE ACCESS IN THE LOS VAQUEROS WATERSHED – 275-TAF/160-TAF RESERVOIR

	Average Width (Feet)	Existing Length (Miles)	Length Inundated by Reservoir (Miles)	Length Replaced (Miles)	New Disturbance (Acres)	Net Change (Miles)	New Total Length (Miles)
Trails							
Hiking-Only Trail	8	39.2	8.1/6.0	15.5/15.5	15.0/15.0	7.4/9.5	46.6/48.7
Multiuse Trail[a]	12	15.8	0.0/0.0	0.0/0.0	0.0/0.0	0.0/0.0	15.8/15.8
Trails Subtotal	**–**	**55.0**	**8.1/6.0**	**15.5/15.5**	**15.0/15.0**	**7.4/9.5**	**62.4/64.5**
Existing Roads							
Dirt Road	20	68.8	9.4/9.4	0.0/0.0	0.0/0.0	(9.4)/(9.4)	59.4/59.4
Gravel Road	25	27.7	3.3/3.3	0.0/0.0	0.0/0.0	(3.3)/(3.3)	24.4/24.4
Paved Road	32	13.4	2.3/2.3	0.8/0.8	2.9/2.9	(1.5)/(1.5)	11.9/11.9
Road Subtotal	**–**	**109.9**	**15.0/15.0**	**0.8/0.8**	**2.9/2.9**	**(14.2)/(14.2)**	**95.7/95.7**
Access							
North Marina Access Road	32	0.33	0/0	0.9/0.9	3.5/3.5	0.9/0.9	1.2/1.2
South Marina Access Road	32	4.1	2.3/2.3	1.8/1.8	7.9/7.9	(1.9)/(1.9)	3.6/3.6
Westside Service Access Road[b]	12	4.6	4.6/4.6	11.1/10.0	16.1/14.5	6.5/5.4	11.1/10
Eastside Service Access Road[c]	12	8.5	0/0	6.0/6.0	8.7/8.7	6.0/6.0	14.5/14.5
Access Subtotal	**–**	**17.5**	**6.9/6.9**	**19.7/18.7**	**35.0/33.7**	**11.5/10.4**	**30.4/29.3**

TAF = thousand acre-feet

[a] Trail for hiking, biking, and equestrian use.
[b] The westside service access road would not be replaced; rather, it would be combined with the replacement shoreline trail and would be designed to allow single-track, 4-wheel-drive access for watershed staff. It would also provide for hiking only.
[c] Through construction of connection trails, the eastside service access roads could be combined to provide an optional eastside trail for hiking only.

SOURCE: ESA

3.6 Overall Construction Program

3.6.1 Construction Duration

Under all alternatives, implementing the project would require the coordination of multiple activities, construction personnel, and other logistical considerations. Construction is expected to take about three years to complete for Alternatives 1, 2, and 3, and about two years for Alternative 4. This estimate is based on experience with similar projects, including the original Los Vaqueros Reservoir project. The following factors would affect the actual duration of the project: the start of construction (i.e., issuance of the Notice to Proceed), weather impacts, reservoir stage when the Notice to Proceed is issued, disposal options for the dead pool water (water at the bottom of the reservoir that is below the lowest portal of the outlet structure), and the

ability to double shift excavation and earthmoving activities. The three-year estimate is based on the following assumptions:

- The Notice to Proceed is issued by early January of Year 1 so the contractors are ready to start at the beginning of the first construction season.
- The reservoir has been emptied to dead pool level by March of Year 1 (275-TAF reservoir only).
- Double shift and Saturday work are implemented.

3.6.2 Work Force and Equipment

The construction labor force would consist of as many as six crews of about 50 to 70 workers each, plus construction management personnel for a total of up to 400 workers at all work sites at one time.

Table 3-7 provides a list of the typical construction equipment expected to be present on site during construction. 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.

TABLE 3-7
CONSTRUCTION EQUIPMENT

Clearing, Excavation, Foundation	Building Construction	Interior, Mechanical, Electrical	Road Work, Utilities	Landscaping
• Haul truck • Scraper • Excavator • Loader • Dozer • Sheeps-foot roller • Water truck • Mechanic's Service truck • Dump truck • Light-Duty truck • Backhoe • Conveyer belt • Pile drivers • Drill rig	• Boom truck • Concrete pump truck • Concrete mix truck • Bobcat • Front-end loader • Light-duty truck • Fuel truck • Water truck • Backhoe • Pile Driver • Large crane • Forklift	• Bobcat • Boom truck • Concrete pump truck • Concrete mix truck • Backhoe • Fuel truck • Water truck • Light-duty truck • Large crane	• Motor grader • Excavator • Heavy-duty truck • Sheeps-foot roller and smooth roller • Paving machine • Asphalt delivery Truck • Water truck	• Backhoe • Light-duty truck • Bobcat

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 24 months. 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 overlap of equipment types and duration is therefore expected.

3.6.3 Truck Trips and Haul Routes

Roadways that would be directly affected by project construction traffic include local streets providing access to Los Vaqueros Reservoir and several regional connectors and highways that provide access to this portion of eastern Contra Costa County.

Traffic-generating construction activities would include trucks hauling equipment and materials to and from the work sites and the daily arrival and departure of the construction workers. Construction trucks on local roadways would include dump trucks, concrete trucks, and other delivery trucks. Dump trucks would be used for earth-moving and clearing, removal of excavated material, and import of other structural and paving materials. Other trucks would deliver heavy construction equipment, job trailer items, concrete forming materials, piping materials, piles, new facility equipment, and other miscellaneous deliveries.

Based on the locations of the work sites, it is assumed that construction workers would use roads proximate to each day's work site on their daily commute. However, many of the commute trips could use the same major roads (e.g., Vasco Road, Byron Highway, State Route 4, State Route 4 Bypass) to reach the localized roads (e.g., Walnut Boulevard, Camino Diablo, Armstrong Road, Byron Hot Springs Road).

3.7 Permits and Approvals Needed for Alternatives

Construction and operation of an expanded Los Vaqueros Reservoir would require permits and/or approvals from numerous federal, state, and local agencies with regulatory authority over portions of the project. The extent of each agency's authority varies according to jurisdictional mandate, geographic responsibility, and area of expertise.

Section 3.7.1 describes the decisions that participating parties overseeing project implementation would be responsible for making and Section 3.7.2 identifies the regulatory permits and approvals that may need to be issued prior to or as a part of project implementation.

3.7.1 Decisions by Participating Parties

A series of decisions need to be made to enable implementation of any of the alternatives. These decisions include policy direction and financial commitments on the part of the project participants.

Federal Decision Processes

Federal decision making will be based on the information contained in the Federal Feasibility Report, in compliance with the *Federal Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (federal P&Gs),* and information analyzed in compliance with NEPA (U.S. Water Resources Council, 1983). These documents will

present the results of the federal feasibility study authorized by Public Law 108-7 and reaffirmed by Public Law 108-361.

Integral to the federal decision process are other legally required processes and information, such as biological opinions from the Endangered Species Act consultation process and permits required by federal, state and local laws. The federal decision process also includes consideration of input from other federal, state, and local agencies, concerned stakeholders, tribes, and the general public.

The final federal decision is documented in a Record of Decision (ROD). The ROD will address the decision and the alternatives considered; the alternative(s) considered to be environmentally preferable; the factors that were considered; whether or not all practicable means to avoid or minimize environmental harm for the alternative selected have been adopted, and if not, why; any monitoring and enforcement program established to ensure identified mitigation measures are accomplished; and any significant comments received on the Final EIS/EIR.

Reclamation. Reclamation is the federal lead agency, as delegated by the Secretary of the Interior, and therefore is responsible for the preparation and processing of the Federal Feasibility Report and EIS. For efficiency, the EIS has been combined with an EIR, prepared by CCWD for compliance with CEQA.

While the NEPA compliance process is a subset of the federal feasibility study process, there are important distinctions to make. The purpose of the NEPA process is to analyze and disclose the impacts of a range of alternatives, and to provide an opportunity for public review and comment prior to the final federal decision. The purpose of a Federal Feasibility Report is to address engineering, economic, environmental and financial aspects of alternatives, determine the potential benefits and costs, and determine if there is a federal interest in the implementation of a project.

Upon completion of the Final Federal Feasibility Report and the Final EIS/EIR, Reclamation's Mid-Pacific Regional Director will make a recommendation that will be submitted to the Commissioner of Reclamation for consideration. Then, the Commissioner will concur or modify the recommendation and forward the Final Federal Feasibility Report, Final EIS/EIR, and Draft ROD to the Secretary of the Interior.

Secretary of the Interior. The Secretary will review the Final Federal Feasibility Report and sign the ROD if he or she concurs with the recommendation and then send the Final Federal Feasibility Report, Final EIS/EIR, and signed ROD to the Office of Management and Budget (OMB) for review.

OMB. In accordance with Executive Order 12322, OMB will review the Final Federal Feasibility Report for consistency with the policy and programs of the President, the federal P&Gs, and other applicable laws, regulations and requirements relevant to the federal planning process.

Congress. Congress will review the information provided by the Secretary and OMB, and then decide whether to authorize the recommended project. Congress is responsible for authorizing projects for construction and providing appropriations to construct projects.

Western. As a Cooperating Agency under NEPA, Western is responsible for coordinating with Reclamation in completing the EIS/EIR to comply with the Department of Energy's NEPA implementing regulations. Western would rely on the EIS/EIR when taking action to provide power and associated facilities. Consistent with those implementing regulations, a Purpose and Need statement specific to Western's limited role as a cooperating agency is provided.

- *Purpose*. Once Reclamation and CCWD make a determination as to which alternative and Power Option they have selected, if any, Reclamation and CCWD will then submit an application to Western. Western's purpose, then, will be to evaluate the application and make a decision on that application. Western's objective related to power supply for the Los Vaqueros Reservoir Expansion Project is to develop electrical delivery and transmission infrastructure and supply power as needed to support the Proposed Action. The purpose of new Western facilities and provision of additional supply is to provide additional power capacity to meet peak power as needed under Alternatives 1, 2, or 3.

- *Need*. The need for Western to evaluate the proposal to provide additional infrastructure and power supply for the Los Vaqueros Reservoir Expansion project is driven by lack of sufficient capacity in existing power facilities owned by Western and PG&E to meet peak power needs at expanded or new Los Vaqueros Reservoir system facilities, the potential to reduce impacts by fully utilizing existing power facilities and infrastructure instead of developing all new power facilities, and the limitations on the Los Vaqueros Reservoir Expansion Project benefits if power needs cannot be met.

State and Local Decision Processes

CCWD. As the lead CEQA agency, CCWD is responsible for certifying the Final EIS/EIR is in compliance with CEQA requirements. Upon certification of the Final EIS/EIR, approval of the project and adoption of findings, CCWD would begin implementation of the project by completing design, awarding construction contracts and entering into agreements with participating beneficiaries.

DWR. As a responsible agency under CEQA, DWR would rely on the Final EIS/EIR in making a decision to participate in the Los Vaqueros Reservoir Expansion Project. DWR's decision on whether to participate and at what level will depend in part on the results of a State Feasibility Report being prepared in parallel with this EIS/EIR.

South Bay water agencies. The South Bay water agencies would each make an independent decision on whether to participate in the Los Vaqueros Reservoir Expansion Project based on their individual agency needs and interests. If these agencies decided to participate, they would rely on the Final EIS/EIR for CEQA compliance.

3.7.2 Regulatory Permits and Approvals

Table 3-8 lists the federal, state, and local permits and regulatory approvals that are expected to be necessary for project implementation. The agencies responsible for issuing these approvals would consider the information presented in this document during their deliberations.

TABLE 3-8
PERMITS AND APPROVALS POTENTIALLY NEEDED FOR IMPLEMENTATION OF LOS VAQUEROS RESERVOIR EXPANSION ALTERNATIVES

Permit	Permitting Authority	Affected Project Elements
Federal Permits/Approvals		
Clean Water Act Section 404/ Rivers and Harbor Act Section 10 Dredge and Fill Permit	U.S. Army Corps of Engineers	Expanded Old River Intake and Pump Station and/or new Delta Intake and Pump Station Portions of reservoir and pipelines in wetlands and waters of the U.S.
Federal Endangered Species Act compliance	U.S. Fish and Wildlife Service	All facilities affecting designated special-status species
Federal Endangered Species Act compliance	National Marine Fisheries Service	All facilities affecting designated special-status anadromous fish species and critical habitat
Magnuson Stevens Fisheries Conservation and Management Act	National Marine Fisheries Service	All facilities affecting Essential Fish Habitat
Private Aids to Navigation Permit	U.S. Coast Guard	Expanded Old River Intake and Pump Station and/or new Delta Intake and Pump Station
Transmission Service Request Permit and Open Access Transmission Service Tariff Process	Western Area Power Administration	Power Option 1 and Power Option 2
State Permits/Approvals		
Water Right Permit amendments	State Water Resources Control Board	Project operations
Clean Water Act Section 401 Water Quality Certification	Central Valley Regional Water Quality Control Board	Project components needing Section 404 permit
Clean Water Act Section 401 Waste Discharge Requirements	Central Valley Regional Water Quality Control Board	Portions of reservoir and pipelines in wetlands and waters of the State
California Endangered Species Act compliance	California Department of Fish and Game	All facilities affecting designated special-status species
Section 1601 et seq. Streambed Alteration Agreement	California Department of Fish and Game	Expanded Old River Intake and Pump Station and/or new Delta Intake and Pump Station and any other facility that could potentially impact the bed or banks of a stream channel.
Encroachment Permit	Department of Water Resources, Division of Land and Right of Way	Transfer-Bethany Pipeline, connection to Bethany Reservoir and potential crossing of the California Aqueduct
Dam Design Approval	Division of Safety of Dams	160- or 275-TAF Reservoir Dam Raise

TABLE 3-8 (Continued)
PERMITS AND APPROVALS POTENTIALLY NEEDED FOR IMPLEMENTATION OF LOS VAQUEROS RESERVOIR EXPANSION ALTERNATIVES

Permit	Permitting Authority	Affected Project Elements
State Permits/Approvals (cont.)		
Encroachment Permit	State of California Reclamation Board	Facilities within designated floodway or floodplain
		Facilities affecting levees under state authority
Encroachment Permit	California Department of Transportation	Portions of project within rights-of-way or easements managed by Caltrans
NPDES Construction Stormwater Permit	Central Valley Regional Water Quality Control Board	Portions of project that may result in discharges to waters of the U.S.
General Order for Dewatering and Other Low Threat Discharge to Surface Waters	Central Valley Regional Water Quality Control Board	Portions of project that could require local groundwater dewatering, resulting in discharges to surface waters
General Permit	State Lands Commission	Portions of new Delta intake and other navigational aides on tidal lands subject to state ownership
National Historic Preservation Act Section 106 Compliance	State Historic Preservation Office	Portions of project that could affect cultural and historic resources considered eligible for inclusion in the National Register of Historic Places
Local Permit/Approvals		
Encroachment Permit	Contra Costa and/or Alameda County(s), and cities	For activities in portions of project area on or affecting rights-of-way or easements managed by Contra Costa or Alameda County or cities or other local jurisdictions
Levee Construction/Maintenance agreement	Reclamation District 800	New Delta Intake and Pump Station