

CHAPTER 2

Project Description Update

2.1 Introduction

This section describes updates to the project description for the Los Vaqueros Reservoir Expansion Project alternatives that have been made since publication of the Draft EIS/EIR, primarily in response to comments received on the Draft but in some cases made to reflect changes in the regulatory framework within which the project would be operated as well as refinements in project design. Section 2.2 describes how Alternative 3 is addressed in this response to comments document (Vol. 4 of the Final EIS/EIR). Section 2.3 presents refinements that apply to the description of one or more of the project alternatives. Section 2.4 presents an analysis of the environmental consequences associated with a variation on the timing of reservoir expansion implementation. Section 2.5 describes the environmentally superior alternative. Section 2.6 describes Reclamation's preferred alternative.

2.2 Treatment of Alternative 3 in the Final EIS/EIR

Alternative 3 – Expanded 275-thousand acre-feet (TAF) Reservoir, No South Bay Connection, Environmental Water Management Emphasis, as presented in the Draft EIS/EIR (Vol. 1, Chapter 3, Description of Project Alternatives, pp. 3-33 through 3-37), includes expansion of the reservoir but does not include construction of the new South Bay Connection conveyance facilities (i.e., no new Delta Intake and Pump Station or Transfer-Bethany pipeline). The operational scenario proposed for this alternative emphasized environmental water management. The goal of this alternative was to provide Reclamation with greater operational flexibility for the Central Valley Project (CVP) system, increasing water supply available at appropriate times for environmental uses such as cold water releases to support salmon spawning, pulse flow releases to support salmon migration, or water supply for the wildlife refuges. Increasing storage would allow CCWD, as a CVP contractor, to take more of its supply from the expanded reservoir at certain times, allowing Reclamation greater flexibility to use water at key times elsewhere in the CVP system for environmental purposes.

The Draft EIS/EIR impact analysis indicates that while Alternative 3 could provide some of the desired environmental water management benefits, the proposed operation would also result in significant and unavoidable impacts to Delta fisheries resources because of the potential for fish entrainment associated with water diversion from the Delta (see Draft EIS/EIR Vol. 1, Section 4.3, Delta Fisheries and Aquatic Resources, Impact 4.3.7, pp. 4.3-87 through 4.3-94). The modeling experts who prepared the Draft EIS/EIR and Final EIS/EIR considered whether the updated

modeling and operations described in Section 5.3 (Vol. 4) would change these conclusions and determined that the fisheries impacts would remain significant and unavoidable. Based on the results of the impact analysis, implementation of the proposed operations under Alternative 3 will not be recommended for approval by CCWD or Reclamation decision-makers. The proposed operation of this alternative would have to be largely redesigned to avoid this significant unavoidable impact and that redesign effort is not being undertaken at this time. Consequently, updated modeling of the proposed operations for Alternative 3 was not conducted for the Final EIS/EIR and discussion of Alternative 3 is not included in the responses to comments that address questions of project operations or effects on water resources, or Delta fisheries and aquatic resources.

For comments that address the proposed facilities or impacts of the proposed facilities (either construction or operation), the responses do include information about Alternative 3, where appropriate. The Final EIS/EIR continues to analyze the physical features of Alternative 3 because it is possible that a future project could combine these physical features with substantially different operations. If future Delta conditions change and a determination is made to pursue a revised version of Alternative 3, then additional California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) analyses and documentation would be undertaken, as necessary.

2.3 Project Description Update

Since publication of the Draft EIS/EIR in February 2009, the descriptions of select elements of the action alternatives considered in the Draft EIS/EIR have been refined or updated. Refinements have been made to three elements of the proposed facilities and operational assumptions have been updated for Alternatives 1, 2 and 4. This section first describes the facility refinements and then reviews the operational scenario updates.

2.3.1 Facility Refinements

The proposed facility refinements have been made in response to comments received on the Draft EIS/EIR, in consideration of the possible timing variant (described in Section 2.4 below), or as a result of additional technical information developed since publication of the Draft EIS/EIR. Refinements to proposed facilities include: (1) reduction in the trail length of the Eastside Trail Option (Alternatives 1-4); (2) realignment of the Westside Trail replacement (Alternative 4); and (3) identification of an additional borrow area for core dam construction materials for the 160-TAF reservoir (Alternative 4).

Table 2-1 summarizes the three project description elements to be refined and the alternatives that would be affected. Each of the three facility refinements listed in Table 2-1 is described in more detail below, followed by an assessment of whether and how these refinements affect the impact analysis and conclusions presented in the Draft EIS/EIR. Each project refinement was evaluated using an environmental checklist approach to consider each environmental resource and impact category analyzed in the Draft EIS/EIR and determine if and the extent to which there would be any impact difference. **Appendix A** contains the environmental assessment tables for each of the three project refinements listed in Table 2-1 and discussed below. The results of this impact assessment are summarized below.

**TABLE 2-1
ALTERNATIVES AFFECTED BY PROPOSED PROJECT DESCRIPTION REFINEMENTS**

Project Description Element to be Refined	Project Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Eastside Trail Reduction	Yes	Yes	Yes	Yes
Westside Trail Realignment	No	No	No	Yes
Secondary Core Borrow Area	No	No	No	Yes

SOURCE: ESA, 2009

As demonstrated in the discussion of each of the project refinements below, in some cases these refinements result in small increases or decreases in the amount of area affected by project activities but in no case do these refinements result in new or substantially more severe impacts than those previously disclosed in the Draft EIS/EIR. In some cases, project refinements result in less impact than described in the Draft EIS/EIR. None of these refinements to the proposed alternatives affects the impact conclusions presented in the Draft EIS/EIR. None of these refinements would affect the No Project/No Action Alternative as described in the Draft EIS/EIR and therefore the No Project/No Action Alternative is not discussed further in this section.

Eastside Trail Reduction (Alternatives 1-4)

Description

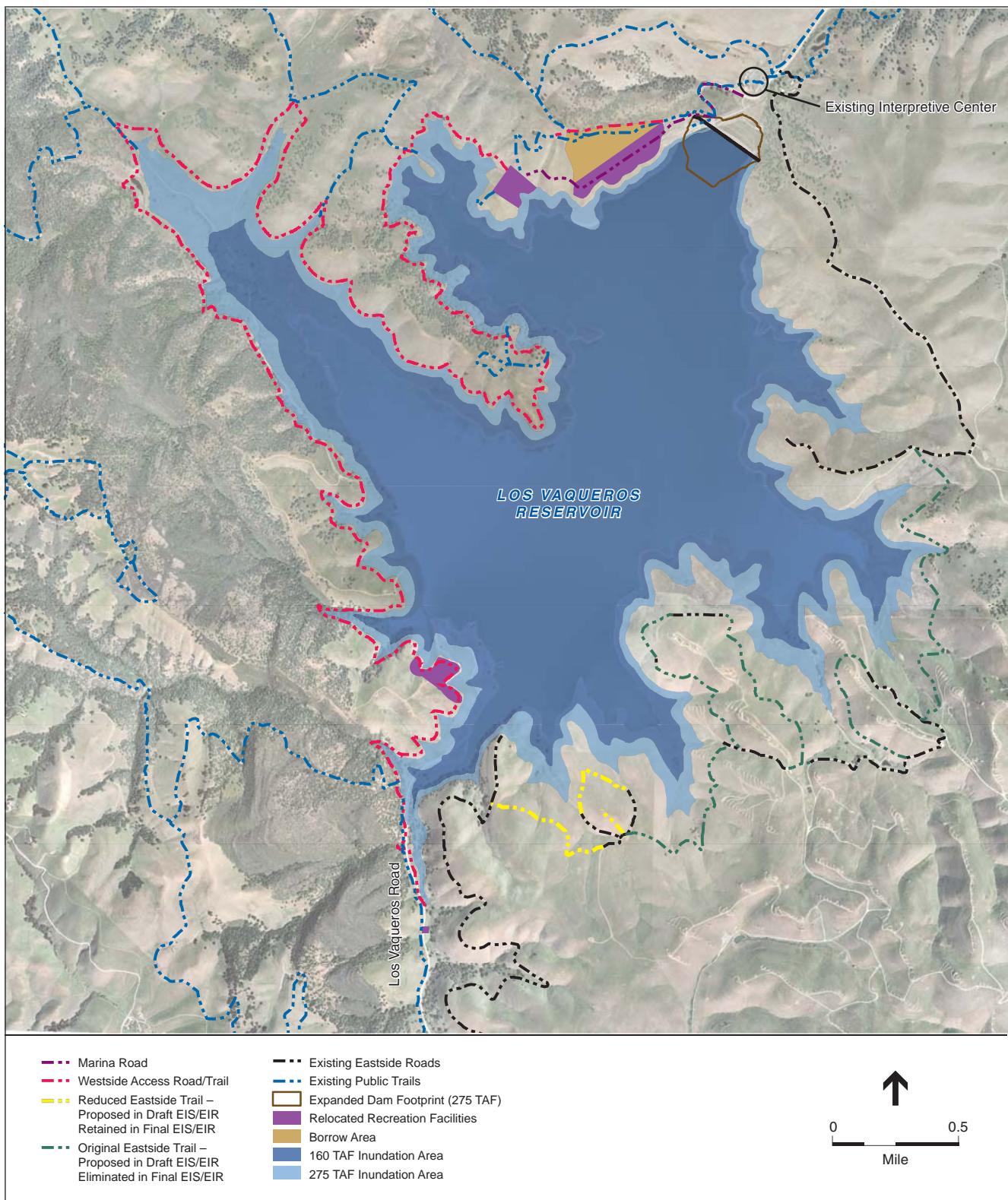
Project Refinement and Reason for Refinement

Some comments received on the Draft EIS/EIR expressed concern that development of the proposed Eastside Trail (Alternatives 1-4) would potentially result in indirect adverse effects to wildlife habitat or cultural resources. Please refer to Section 3.8, Master Response 8, Biological Resources and Section 3.12, Master Response 12, Cultural Resources for more detailed discussion about comments received regarding the Eastside Trail and responses to those comments. In response to comments expressing concern about this project element, the majority of the Eastside Trail has been eliminated from all of the alternatives. Only a short segment of new trail is proposed under this refinement.

Comparison of Original and Refined Proposed Eastside Trail

Figure 2-1 depicts both the original¹ and reduced proposed Eastside Trail in relationship to the 275-TAF reservoir (Alternatives 1, 2 and 3) and the 160-TAF reservoir (Alternative 4). As originally proposed, all action alternatives included the option for the addition of six miles of hiking-only trails connecting 8.5 miles of existing access roads on the east side of the reservoir. The total 14.5-mile Eastside Trail would extend from the south gate on Los Vaqueros Road, near Vasco Road, to the reservoir, then around the south/southeast side of the reservoir eventually meeting up with

¹ As originally proposed in the Draft EIS/EIR.



SOURCE: GlobeXplorer, 2007; and ESA, 2010

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Figure 2-1
Eastside Trail Reduction
(Alternatives 1, 2, 3, and 4)

Walnut Boulevard, north of the dam. As refined, the Eastside Trail would extend from the south gate to the reservoir, then around the south/southeast side of the reservoir to a planned lookout point. The reduced trail would be approximately 5 miles in length, comprised of approximately 4 miles of existing access roads and 1 mile of newly constructed trail. **Table 2-2** provides a comparison of the original Eastside Trail footprint as proposed in the Draft EIS/EIR and as refined for Alternatives 1-4 in the Final EIS/EIR.

TABLE 2-2
EASTSIDE TRAIL FOOTPRINT
COMPARISON OF ORIGINAL¹ AND REFINED PROPOSALS

Resource Impacts	Total Length (feet)	Total Length (miles)	Existing Road Length (feet/miles)	New Trail Length (feet/miles)	Width (feet)	Area of Impact (acres)
Long-term Effects (Original)	76,380.1	14.5	44,936.4/8.5	31,443.7/6.0	17	12.31
Long-term Effects (Refined)	26,770.9	5.1	21,054.7/4.0	5,716.1/1.1	17	2.25
Reduction in Length and Area of Eastside Trail Footprint	49,609.2	9.4	23,881.7/4.5	25,727.6/4.9	0	10.06
Temporary Effects – (Original)	76,380.1	14.5	N.A.	N.A.	6	10.5
Temporary Effects (Refined)	26,770.9	5.1	N.A.	N.A.	6	3.7
Reduction in Area of Temporary Impact (Construction Impact)	49,609.2	9.4	N.A.	N.A.	0	6.8

¹ As originally proposed in the Draft EIS/EIR.

SOURCE: ESA, 2009

Environmental Effects

Reduction of the Eastside Trail from a total of 14.5 miles to 5 miles (including 1 mile of new trail rather than 6 miles) would reduce the total footprint area of the Eastside Trail system, and therefore would result in a reduction in temporary and permanent impacts.

Table A-1, Impact Assessment for the Eastside Trail, shows the impact assessment conducted for the realignment and indicates how the reduced Eastside Trail could result in decreases in adverse effects on some resources along with a corresponding decrease in beneficial effects associated with expanding the hiking trail network within the watershed (see Vol. 4, Appendix A).

Areas of Less Impact

The reduced Eastside Trail would reduce impacts on environmental resources as compared to the analysis of the original Eastside Trail proposed in the Draft EIS/EIR because of the reduced length of trail that would be constructed and open for public use.

Soils. The smaller area of disturbance associated with reducing the trail length would result in slightly reduced potential for impacts associated with soil erosion, loss of topsoil and related cumulative effects.

Local Hydrology. The smaller area of disturbance associated with reducing the trail length would result in slightly reduced potential for effects on water quality, drainage patterns/increased runoff and related cumulative effects.

Biological Resources. Reduction of the Eastside Trail would result in reduced temporary and permanent impacts to habitat and wildlife on the eastside of the reservoir due to the reduced area of disturbance as well as the reduction in the level of public access associated with the trail as originally proposed in the Draft EIS/EIR. As described in Table A-1 (Vol. 4, Appendix A), effects on the following resources would be reduced as a result of less direct and indirect effect: Natural Community Conservation Plan (NCCP) habitat types and associated sensitive plant communities; wetland habitat and waters of the U.S.; California tiger salamander upland habitat and California red-legged frog wetlands and stock ponds located within trail area; western pond turtle populations; vernal pool species and habitat; burrowing owl habitat; San Joaquin kit fox habitat and regional movement; foraging habitat for golden eagle and Swainson's hawk; Alameda whipsnake habitat in scrub habitat areas of the watershed; breeding bird nest sites; habitat for nonlisted special-status reptile species that may occur in the watershed grasslands; nonlisted special-status mammal species; and cumulative biological effects.

Air Quality. Construction of a shorter trail would result in a slight decrease in construction-related air pollution emissions, including dust and construction vehicle emissions.

Hazardous Materials and Public Health. Reducing the length of the Eastside Trail would slightly decrease risks associated with accidental release of hazardous materials during construction, wildland fires and associated cumulative effects.

Cultural Resources. Reducing the length of the Eastside Trail and thereby limiting public access to the east side of the reservoir would avoid the trail passing near two historic properties and would reduce potential indirect effects of public trespass upon areas considered generally high in potential for paleontological resources.

Reduced Beneficial Effects

Recreation. The reduced Eastside Trail would result in fewer new trail miles available for recreational use inside the Los Vaqueros watershed. However, there would be no adverse effects on existing recreational opportunities as a result of this refinement. Further, the long-term benefits to recreation associated with construction of the new lookout would still occur.

Socioeconomics. The reduced Eastside Trail would result in fewer new trail miles and thus a very slight reduction in the overall amount of project construction work, which would reduce beneficial effects upon local income and employment. However, this change would be very minor in the context of the overall reservoir expansion project. There would be no adverse effects on existing employment opportunities as a result of this refinement, and project benefits from construction spending and employment similar to those described in the Draft EIS/EIR would still occur.

Environmental Justice. Reduction of the Eastside Trail would slightly reduce the amount of project construction work. However, this change would be minor. There would be no adverse effects on

existing employment opportunities available locally to minority or low-income populations as a result of this refinement, and project benefits from a temporary increase in employment opportunities similar to those described in the Draft EIS/EIR would still occur.

Summary of Effects

As compared to the analysis of the original Eastside Trail proposed in the Draft EIS/EIR, there would be no substantial change in potential environmental impacts or beneficial effects associated with the reduced Eastside Trail and no changes in level of significance for any impact conclusions. Mitigation measures presented in the Draft EIS/EIR still apply and remain sufficient to reduce related impacts to less than significant levels.

Westside Trail Realignment (Alternative 4 only)

Description

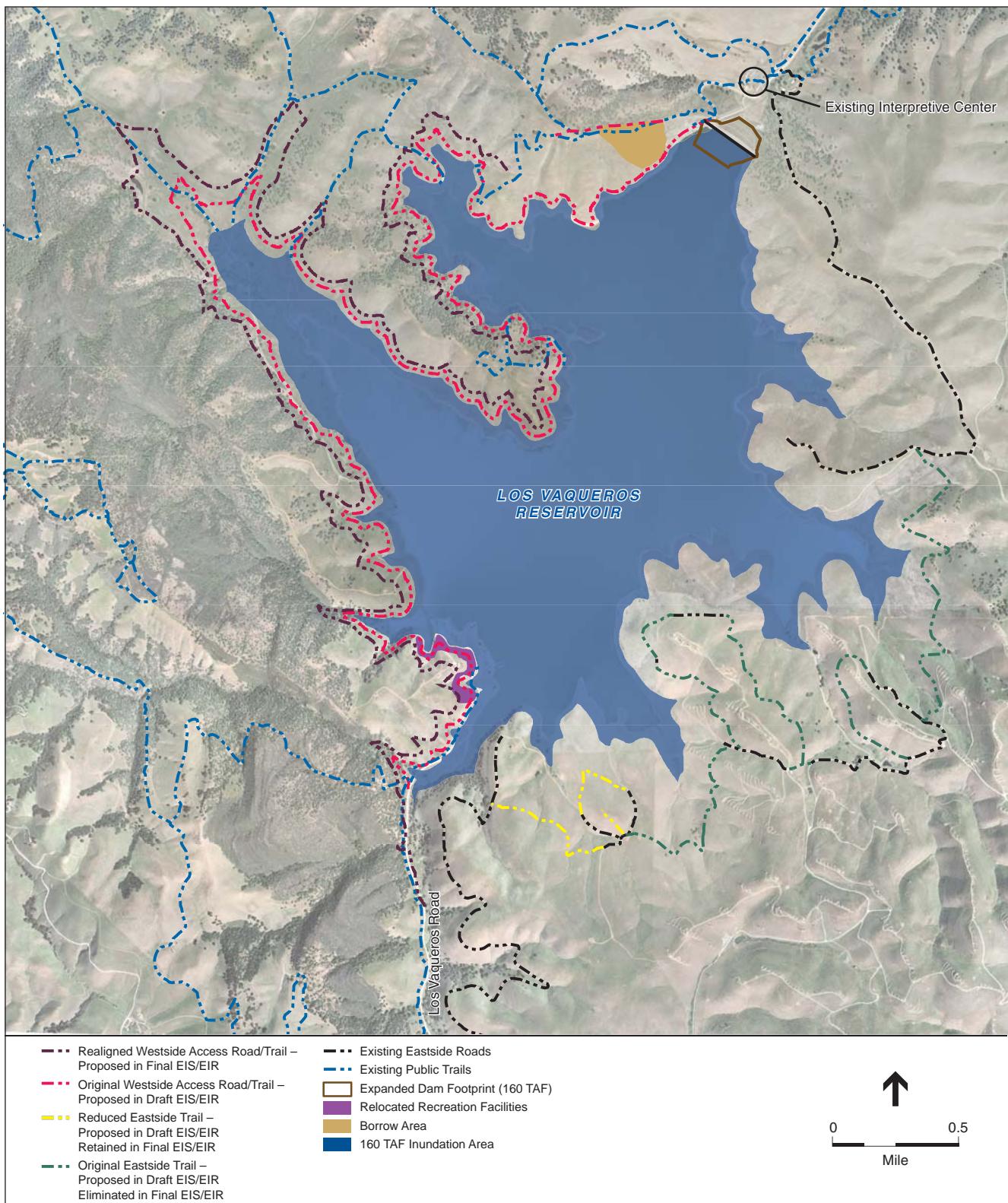
Project Refinement and Reason for Refinement

The Draft EIS/EIR identifies one alignment for the Westside Trail under Alternatives 1, 2 and 3, and a slightly different alignment under Alternative 4. Under the proposed refinement, the Westside Trail to be constructed under Alternative 4 (160 TAF) would be realigned to match the alignment evaluated under Alternatives 1, 2 and 3 (275 TAF) in the Draft EIS/EIR. Several comments raised concerns regarding the uncertainty surrounding future Delta operations. As described in Section 2.2, below, the lead agencies recognize that it is possible that the reservoir could be expanded to 160 TAF, and then the agencies later may consider whether to expand the reservoir further to 275 TAF. Accordingly, the Final EIS/EIR evaluates the potential for changes in impacts associated with such a timing variant (see Section 2.4). Constructing the Westside Trail at a higher location in the watershed under Alternative 4 would minimize or avoid direct, indirect and cumulative environmental impacts associated with relocating and reconstructing this component if the reservoir were expanded in the future from 160 TAF to 275 TAF. **Figure 2-2** shows the approximate location of the realigned Westside Trail, as it would be constructed under Alternative 4, relative to both the 160 TAF and 275 TAF inundation areas.

Comparison of Original and Refined Proposed Westside Trail

Under Alternatives 1, 2 and 3 (275 TAF), as described in the Draft EIS/EIR, the Westside Trail would extend from the southern end of the reservoir near the existing marina to the north side of the dam, pass through the proposed relocated marina complex on the north side of the expanded reservoir, then through the borrow area to the road on the northwest side of the dam, generally following the 580-foot contour line to connect with access roads on the south end of the reservoir. Under Alternative 4 (160 TAF), as described in the Draft EIS/EIR, the trail would pass above the existing marina area to the road on the northwest side of the dam, generally following the 530-foot contour line.

Realigning the Westside Trail under Alternative 4 would include locating the trail at the 580-foot elevation level (as planned for a 275-TAF reservoir) instead of the 530-foot elevation level. Doing so would increase the trail length by approximately two miles. This realignment would



SOURCE: GlobeXplorer, 2007; and ESA, 2010

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Figure 2-2
Westside Trail Realignment
(Alternative 4)

place the Westside Trail about 50 feet in elevation above the 160-TAF reservoir water surface when full. A short segment of the trail would be re-aligned at the southern end of the reservoir to provide access to the marina that, under Alternative 4, would be reconstructed at the southern end of the reservoir, upslope of the existing marina site.

Environmental Effects

Construction of a realigned Westside Trail under Alternative 4 would result in an increase in overall trail length of approximately two miles and an increased footprint area of approximately 4.9 acres.

Table 2-3 provides a comparison of the original Westside access road and trail network footprint as proposed in the Draft EIS/EIR and as refined for Alternative 4.

**TABLE 2-3
WESTSIDE TRAIL FOOTPRINT (ALTERNATIVE 4)
COMPARISON OF ORIGINAL¹ AND REFINED PROPOSALS**

Resource	Length (feet)	Length (miles)	Width (feet)	Area of Impact (acres)
Long-term Effects (Original)	58,767	11.1	34	45.43
Long-term Effects (Refined)	68,624	13.0	34	50.35
Increase in Length and Area Westside Trail Footprint	9,857	1.9	0	4.92
Temporary Effects (Original)	--	--	16 ¹	21.34
Temporary Effects (Refined)	--	--	16 ¹	23.62
Increase in Area of Temporary Impact	N/A	N/A	0	2.28

¹ As originally proposed in the Draft EIS/EIR.

N/A – Not Applicable

SOURCE: ESA, 2009

Table A-2, Impact Assessment for the Westside Trail presents the impact assessment conducted for the refinement and indicates how the realigned Westside Trail could result in decreased or increased effects as compared to the analysis of the original Westside Trail proposed for Alternative 4 in the Draft EIS/EIR (see Vol. 4, Appendix A). Temporary construction-related impacts would increase incrementally with the increase in trail length and footprint. However, mitigation measures already included in the Draft EIS/EIR would reduce any potentially significant construction-related impacts to Less-than-Significant.

Areas of Impact Increase

The realigned Westside Trail under Alternative 4 would result in the potential for slightly increased effects on the environmental resources listed below, as compared to the analysis of the original Westside Trail proposed for Alternative 4 in the Draft EIS/EIR. However, these effects would be the same as those described for the Westside Trail as analyzed under Alternatives 1, 2 and 3 in the Draft EIS/EIR. Temporary construction-related impacts would increase incrementally with the increase in trail footprint; however, mitigation measures already included in the Draft EIS/EIR would reduce any potentially significant construction-related impacts to Less-than-Significant.

Soils. The larger area of disturbance would result in slightly increased potential for impacts associated with soil erosion, loss of topsoil and related cumulative effects. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 1, Section 4.5, Mitigation Measures 4.5.1a and 4.5.1b, pp. 4.5-19 through 4.5-21; Mitigation Measure 4.5.2, pg. 4.5-29; and Section 4.6, Mitigation Measures 4.6.2a and 4.6.2b, pp. 4.6-102 through 4.6-103).

Local Hydrology. The larger area of disturbance would result in slightly increased potential for impacts to water quality, increased runoff and related cumulative effects. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 1, Section 4.5, Mitigation Measures 4.5.1a and 4.5.1b, pp. 4.5-19 through 4.5-21 and Mitigation Measure 4.5.2, pg. 4.5-29).

Biological Resources. Realignment of the Westside Trail would result in some increase in temporary and permanent impacts to habitat and wildlife on the west side of the reservoir due to the increased area of disturbance. As described in Table A-2, effects on the following resources would potentially be greater: NCCP habitat types and associated sensitive plant communities; wetland habitat and waters of the U.S.; burrowing owl & habitat; foraging habitat for golden eagle and Swainson's hawk; breeding bird nest sites; Alameda whipsnake habitat in scrub habitat areas of the watershed; Valley Elderberry Longhorn Beetle habitat; breeding bird nest sites; habitat for nonlisted special-status reptile species that may occur in the watershed grasslands; nonlisted special-status mammal species; and cumulative biological effects.

In addition to the above, realignment of the Westside Trail under Alternative 4 would result in the following increased effects:

- Construction of the Westside Trail at the 580-foot elevation level (as planned for a 275-TAF reservoir) would affect special-status plant species (Brewer's dwarf-flax) on the westside of the reservoir. The trail relocation as originally proposed under Alternative 4 would not impact this plant. Implementation of Mitigation Measures 4.6.3a and 4.6.3b in the Draft EIS/EIR would reduce this impact to Less-than-Significant with Mitigation (Vol. 2, Section 4.6, pp. 4.6-106 through 4.6-107). This impact, mitigation measure and post-mitigation impact conclusion are the same as that for the Westside Trail as proposed under Alternatives, 1, 2, and 3 (275 TAF) (Impact 4.6.3 Special-status plant species).
- Construction of the Westside Trail at the 580-foot elevation level (as planned for a 275-TAF reservoir) would result in increased effects on California tiger salamander habitat (two additional ponds would be impacted and grassland, where the trail would be constructed, is California tiger salamander upland aestivation habitat) and California red-legged frog habitat (wetlands and stock ponds) located within trail area. With implementation of Mitigation Measures 4.6.4a and 4.6.4b in the Draft EIS/EIR (Vol. 2, Section 4.6, pp. 4.6-112 through 4.6-115), this impact would remain the same as for Alternatives 1, 2, and 3 (Less-than-Significant with Mitigation) (Impact 4.6.4 California red-legged frog and California tiger salamander habitat).
- Construction of the Westside Trail at the 580-foot elevation level (as planned for a 275-TAF reservoir) would result in increased effects on San Joaquin kit fox habitat and regional movement due to the increased trail length. With implementation of Mitigation

Measures 4.6.7a-c in the Draft EIS/EIR (Vol. 2, Section 4.6, pg. 4.6-139), impacts to habitat would remain the same as for Alternatives 1, 2, and 3 (Less-than-Significant with Mitigation).

Air Quality. The larger area of disturbance would result in the potential for slightly increased construction-related air pollution emissions. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Section 4.10, Mitigation Measure 4.10.1, pg. 4.10-28 through 4.10-29.)

Hazardous Materials and Public Health. Construction of the realigned Westside Trail could potentially result in slightly increased risks associated with accidental release of hazardous materials during construction, wildland fires and associated cumulative effects. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Section 4.5, Mitigation Measures 4.5.1a and 4.5.1b, pp. 4.5-19 through 4.5-21; Section 4.13, Mitigation Measure 4.13.2, pg. 4.13-19; Mitigation Measure 4.13.3, pp. 4.13-20 through 4.13-21).

Cultural Resources. As discussed above, the realigned Westside Trail would affect fewer known historic properties. However, because of the larger area of disturbance, there would be an increase in potential to encounter unknown cultural and paleontological resources during excavation. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Mitigation Measures 4.16.1a through 4.16.1h, pp. 4.16-48 through 4.16-50; Mitigation Measures 4.16.2a and 4.16.2b, pp. 4.16-50 through 4.16-51; and Mitigation Measure 4.16.3, pg. 4.16-55).

Areas of Less Impact

Cultural Resources. The realigned Westside Trail would pass through or nearby five known historic properties. As originally proposed under Alternative 4, the trail would pass through or nearby six known historic properties.

Increased Beneficial Effects

Socioeconomics. The realigned Westside Trail would slightly increase the amount of construction work under Alternative 4, which could result in slightly increased beneficial effects upon local income and employment. This change would be minor. Project benefits from construction spending and employment would be similar to those described in the Draft EIS/EIR.

Environmental Justice. The realigned Westside Trail would slightly increase the amount of construction work and related employment opportunities available locally to minority or low-income populations under Alternative 4. This change would be minor. Project benefits from a temporary increase in employment opportunities would be similar to those described in the Draft EIS/EIR.

Summary of Effects

Because the realigned Westside Trail would be approximately two miles longer than the trail relocation originally proposed under Alternative 4, this project refinement would result in increased

effects for select impacts related to biological resources, soils, local hydrology, air quality, and hazardous materials and public health compared to the original Westside Trail under Alternative 4 as proposed in the Draft EIS/EIR. However, these impacts would be the same as those described for the Westside Trail under Alternatives 1, 2 and 3, and with mitigation measures already provided in the Draft EIS/EIR, impact conclusions would remain the same as the conclusions for Alternatives 1, 2 and 3. With one exception, the mitigation measures required to address the Westside Trail realignment under Alternative 4 were already proposed in the Draft EIS/EIR for implementation with Alternative 4. The Westside Trail realignment for Alternative 4 would require mitigation for effects on the Brewer's dwarf-flax, a special status species (Mitigation Measures 4.6.3a and 4.6.3b in the Draft EIS/EIR, Vol. 2, Section 4.6, pp. 4.6-106 through 4.6-107).

Secondary 160-TAF Core Borrow Area (Alternative 4 only)

Description

Project Refinement and Reason for Refinement

To minimize truck trip length and associated emissions, and to reduce cost, most of the materials for the Los Vaqueros Reservoir dam raise would be obtained from sites within the watershed. As discussed in Draft EIS/EIR Chapter 3, Description of Project Alternatives, under Alternative 4 alluvial clay deposits on the floor of the existing reservoir would not be available for use in constructing the dam core because the reservoir would not be fully drained under this alternative. Therefore, it was proposed that approximately 270,000 cubic yards of clay be excavated from 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 still to be determined. Therefore, a borrow area siting zone was identified for impact analysis purposes within which the final borrow area would be located (see Draft EIS/EIR, Vol. 1, Chapter 3, Figure 3-18, pg. 3-52). The dimensions and depth of the actual borrow area within this zone will depend on the location, depth, and quality of the clays available. Although excavation of clay materials might not need to occur on all acres within the zone, for purposes of impact analysis it was assumed that the entire 46-acre zone would be disturbed. This is referred to in this discussion as the primary core borrow area zone.

More detailed evaluation completed since publication of the Draft EIS/EIR indicates that the quantity of clay with suitable engineering properties occurring at the proposed primary core borrow area zone evaluated in the Draft EIS/EIR could be less than needed for construction. As a result, an additional core borrow area zone (about 41 acres) has been identified and is referred to as the secondary core borrow area zone. Identification of a secondary core borrow area zone is a conservative approach to provide a supplemental source of core material, if needed. The project will avoid use of the secondary core borrow area zone if feasible. The intent is to ensure that there is adequate, usable material within a reasonable proximity to the dam construction site to minimize the indirect impacts mentioned above. This secondary core borrow area zone is located approximately two miles downstream of the dam. As is the case for the primary zone, the dimensions and depth of the actual borrow area within this secondary zone, if used, will depend on the location, depth, and quality of the clays available.

Comparison of Original and Refined Project Component

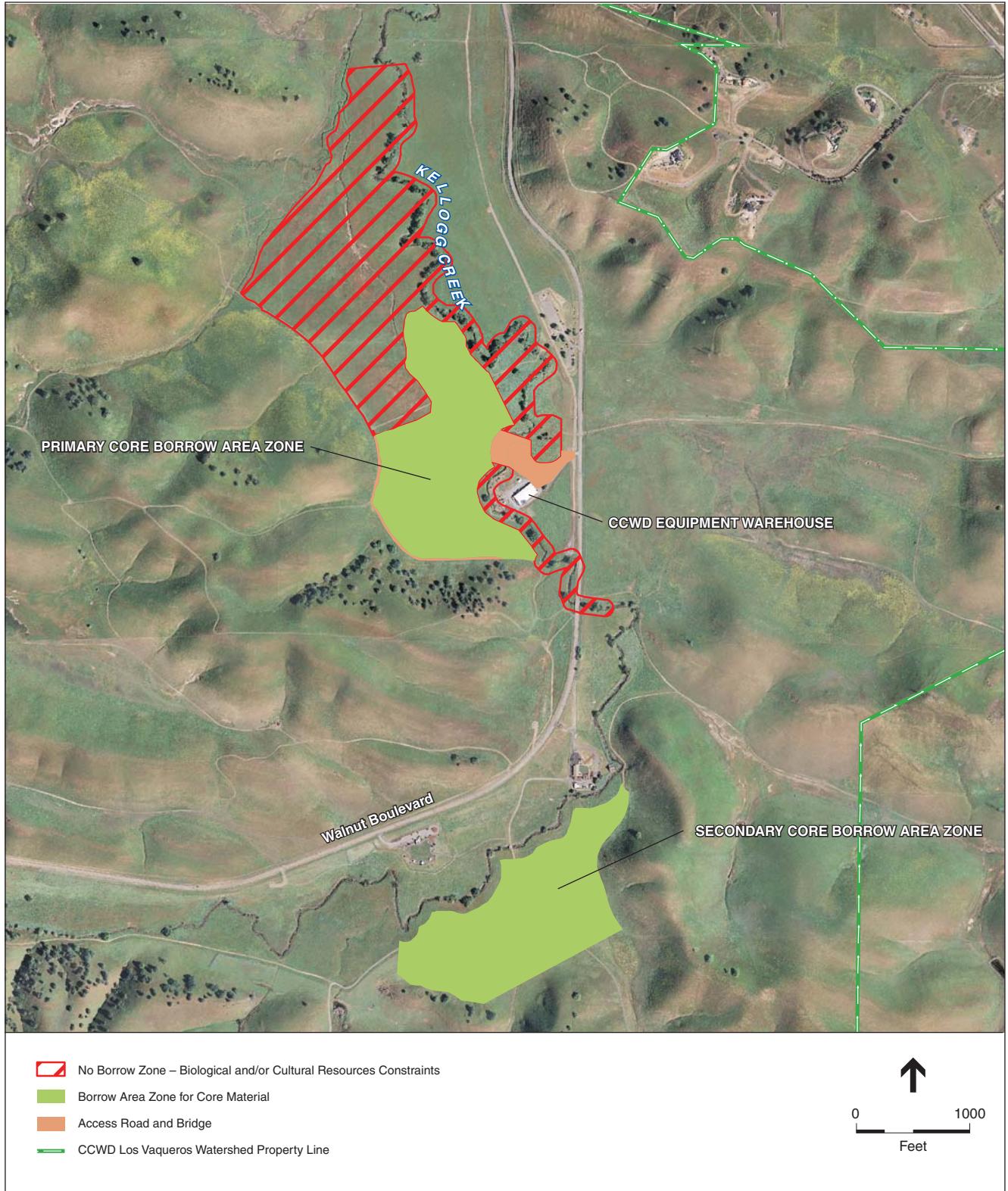
As discussed in the Draft EIS/EIR, the specific location and layout of the primary core borrow area would be determined during construction within a larger borrow area siting zone that was identified for impact analysis purposes in the Draft EIS/EIR. Similarly, the specific location and layout of the secondary core borrow area would be determined during construction within a larger siting zone that has been identified for purposes of environmental analysis. **Figure 2-3** shows the approximate locations of both the primary and secondary core borrow area zones. (The location of the primary core borrow area zone in Figure 2-3 in this chapter is the same as that depicted in Figure 3-18 in the Draft EIS/EIR.) The secondary core borrow area zone is located approximately 2,000 feet southeast (at its closest point) of the primary core borrow area zone, south and on the other side of Walnut Boulevard. The dimensions and depth of the actual borrow area within both the primary and secondary zones will depend on the location, depth, and quality of the clays available for the dam core construction. Both the primary and secondary core borrow area zones were delineated in the field through a joint effort by the engineering and environmental teams to identify areas with the potential for suitable clay materials that avoid sensitive biological resources to the extent possible.

Mitigation measures that apply to use of the primary core borrow area would also be applied to use of the secondary core borrow area. Topsoil would be removed from the borrow area, the underlying clay extracted and the topsoil replaced. As discussed for the primary core borrow area, the secondary core borrow 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, California tiger salamander and/or vernal pool fairy shrimp as part of the project mitigation program.

Other aspects of the Alternative 4 dam construction would not change. Construction of a 160-TAF dam and its appurtenant facilities would also involve obtaining claystone and sandstone materials to construct the dam shell, which would be obtained from borrow areas adjacent to the existing dam's left abutment. Additional construction materials such as those to be used for gravel drains, sand filters and pipeline segments would be imported to the construction area, as previously discussed in the Draft EIS/EIR (Vol. 1, Section 3.5.1).

Environmental Effects

If material from a secondary core borrow area is needed for construction of Alternative 4, disturbance of this area would result in similar impacts to those identified for disturbance of the primary core borrow area. As shown in **Table 2-4** the total footprint of the core borrow area zones would increase from an estimated 46 acres for the primary core borrow area zone to 87 acres for both core borrow area zones, if the maximum area were disturbed (i.e., if the total acreage within both the core borrow area siting zones were disturbed). The full 87 acres comprising the two core borrow area zones might not need to be disturbed. The secondary core borrow area zone would be used if the primary core borrow area zone can not provide enough suitable clay material for use in rebuilding the dam core. It is possible that not all of the 46-acre primary core borrow area zone would be disturbed. Further, only enough area within the 41-acre secondary core borrow area zone needed to provide the remaining core material would be disturbed. Under this



SOURCE: USAD, 2006; GlobeXplorer, 2007; CCWD, 2007; CCC, 2007; MWH, 2008; and
ESA, 2010

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Figure 2-3
160 TAF Primary and
Secondary Core Borrow Area Zones
(Alternative 4)

TABLE 2-4
TOTAL CORE BORROW AREA ZONE FOOTPRINT
COMPARISON OF ORIGINAL¹ AND REFINED PROPOSALS

Resource	Area of Impact (square feet)	Area of Potential Impact ² (acres)
Primary Core Borrow Area	2,005,864.8	46
Secondary Core Borrow Area (Increase in Potential Core Borrow Area)	1,786,655.7	41
Total Primary and Secondary Areas	3,792,520.5	87

¹ As originally proposed in the Draft EIS/EIR.

² This is the maximum area of potential impact. Acquisition of the necessary amount of borrow material may not require the disturbance of the entire total area.

SOURCE: ESA, 2009

scenario the total acreage disturbed for borrow material might be the same as evaluated in the Draft EIS/EIR. However, it is also possible that the depth of suitable material in the primary core borrow area zone would be less than anticipated and that at least a portion, if not all, of the secondary core borrow area zone would need to be disturbed as well. In this case, use of the secondary core borrow area zone would result in additional acres of surface disturbance. The total amount of material to be excavated to meet the requirements of building the dam core under Alternative 4 (160 TAF reservoir) would not change.

Table A-3, Secondary Core Borrow Area Zone Impact Assessment (see Vol. 4, Appendix A) shows the impact assessment conducted for the secondary core borrow area zone and indicates how the addition of the secondary core borrow area zone could result in increases, no change, or decreases in effects to some resources as compared to the analysis of impacts assuming only the primary core borrow area zone would be disturbed under Alternative 4 in the Draft EIS/EIR. Mitigation measures already included in the Draft EIS/EIR would reduce any potentially significant construction-related impacts to Less-than-Significant.

Soils. The potentially larger area of disturbance associated with use of the secondary core borrow area zone would result in increased potential for impacts associated with soil erosion, loss of topsoil and related cumulative effects. The secondary core borrow area zone lies near the primary core borrow area zone in an area with similar soils (see Draft EIS/EIR, Vol. 1, Section 4.4, Figure 4.4-2, pg. 4.4-12), such that surface disturbance in this area would result in the same potential soil effects as described in the Draft EIS/EIR for the primary zone (see Draft EIS/EIR, Vol. 1, Section 4.4, Impact 4.4.2, pp. 4.4-22 through 4.4-24). With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 1, Section 4.5, Mitigation Measures 4.5.1a and 4.5.1b, pp. 4.5-19 through 4.5-21; Mitigation Measure 4.5.4, pg. 4.5-29; and Vol. 2, Section 4.6, Mitigation Measures 4.6.2a and 4.6.2b, pp. 4.6-102 through 4.6-103).

Local Hydrology. The potentially larger area of disturbance associated with use of the secondary core borrow area would result in increased potential for impacts to water quality, drainage patterns/increased runoff, and related cumulative effects. Like the primary core borrow area zone, the

secondary core borrow area zone is located in the Kellogg Creek valley, downstream of Los Vaqueros Reservoir. Both borrow area zones are located in proximity to the Kellogg Creek channel. Use of the secondary core borrow area would have erosion effects and effects on local drainage similar to those described for the primary core borrow area. If use of this second borrow area is needed, then the project would result in additional acreage of surface soil disturbance that could result in additional erosion leading to water quality effects. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 1, Section 4.5, Mitigation Measures 4.5.1a and 4.5.1b, pp. 4.5-19 through 4.5-21 and Mitigation Measure 4.5.4, pg. 4.5-29). These storm water pollution prevention measures apply to each and every construction area where surface disturbance occurs and thus would effectively mitigate the site-specific effects at the secondary core borrow area.

With respect to effects on local drainage, use of the secondary core borrow area would result in short-term disturbance of drainage across the active borrow site. Following removal of required borrow materials, the area would be restored. The local area would continue to drain to Kellogg Creek. As discussed in the Draft EIS/EIR (Vol. 1, Section 4.5, Impact 4.5.3, pp. 4.5-24 through 4.5-26), the effect of project construction under all alternatives on local drainage was found to be less than significant. In accordance with the impact significance criteria, the project would not substantially alter the existing drainage pattern of the site or project area in a manner that would cause substantial erosion and sedimentation and/or flooding onsite or offsite. Short-term disturbance of up to an additional 41 acres of grassland within the secondary core borrow area zone would not alter the impact conclusion of less than significant.

Biological Resources. As shown on Figure 2-3, above, the secondary core borrow area zone is located near the primary core borrow area zone (within approximately 2,000 feet) in similar grassland habitat. The boundaries of both the primary and secondary core borrow area zones were delineated in the field through a joint effort by the Los Vaqueros Reservoir Expansion Project engineering and environmental teams to identify areas with the potential for suitable clay materials that avoid sensitive biological resources to the extent possible. The secondary core borrow area zone was sited to minimize impacts to biological resources; the site avoids trees, wetlands, and existing mitigation ponds.

Use of the secondary core borrow area could increase the amount of grassland affected by the project by up to 41 acres. As discussed in the Draft EIS/EIR for the primary core borrow area zone, these grasslands may provide habitat for various special status species within the watershed, including California tiger salamander habitat (upland aestivation habitat); western pond turtle populations that may occur in the uplands along Kellogg Creek; San Joaquin kit fox (foraging habitat and movement corridor); burrowing owl (nesting and foraging habitat); golden eagle and Swainson's hawk (foraging habitat); Alameda whipsnake non-scrub habitat; breeding birds (grassland provides nesting and foraging habitat for some bird species); nonlisted reptile special-status species; nonlisted special-status mammal species (grassy open areas could provide habitat for badger and pocket mouse burrows). No special status plants occur in this area. Following use of this area, grassland vegetation would be restored.

With implementation of mitigation measures in the Draft EIS/EIR, impacts to these resources would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Section 4.6, Mitigation Measures 4.6-1a and 4.6.1b, pp. 4.6-91 through 4.6-92; Mitigation Measures 4.6.2a and 4.6.2b, pp. 4.6-102 through 4.6-103; Mitigation Measures 4.6.4a and 4.6.4b, pp. 4.6-112 through 4.6-115; Mitigation Measure 4.6.5, pg. 4.6-119; Mitigation Measures 4.6.7a, 4.6.7b and 4.6.7c, pp. 4.6-139 through 4.6-140; Mitigation Measure 4.6.8a and 4.6.8b, pp. 4.6-145 through 4.6-146; Mitigation Measures 4.6.9a and 4.6.9b, pp. 4.6-151 through 4.6-153; Mitigation Measures 4.6.10a and 4.6.10b, pp. 4.6-157 through 4.6-158; Mitigation Measure 4.6.11, pp. 4.6-160 through 4.6-161; Mitigation Measures 4.6.12a, 4.6.12b and 4.6.12c, pp. 4.6-162 through 4.6-164; Mitigation Measure 4.6.14, pg. 4.6-168; and Mitigation Measures 4.6.15a and 4.6.15b, pp. 4.6-170 through 4.6-172). Cumulative impacts would remain Less-than-Significant with Mitigation with the implementation of the mitigation measures listed above. These measures provide for site restoration to restore grassland habitat on site and provide for additional offsite habitat enhancement, at appropriate ratios, to compensate for project effects.

Use of the secondary core borrow area would also result in short-term impacts to regional movement opportunities for the kit fox. As shown in Draft EIS/EIR Figure 4.6-24, the secondary core borrow area zone is located northeast of the dam in an area that includes the land to east and north of the reservoir that provides a potential movement corridor for the kit fox in moving through and around the reservoir watershed up to Round Valley. Use of the secondary core borrow area would contribute to construction activities in this area north of the reservoir that could result in short-term disturbance of kit fox movement. Following borrow activities, the site would be restored and there would be no permanent effects on potential kit fox movement through the area. With implementation of mitigation measures in the Draft EIS/EIR, impacts to these resources would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Section 4.6, Mitigation Measures 4.6.7a and 4.6.7b, pp. 4.6-139 through 4.6-140).

Air Quality. Use of the secondary core borrow area has the potential to slightly increase construction-related air pollution emissions. The total quantity of material to be excavated for use in construction of the dam core does not change with the addition of the secondary core borrow area. However, if the secondary core borrow area is needed, some additional surface area clearing would occur, which would result in a slight increase in equipment operation and associated construction equipment emissions. At the same time, the haul distance to the dam is slightly shorter from the secondary core borrow area zone than from the primary core borrow area zone (the two zones are approximately one quarter mile apart), which would result in a slight decrease in emissions from construction activities. Use of the secondary core borrow area, if necessary, would result in only a slight increase in construction equipment emissions, if any. As discussed in the Draft EIS/EIR (see Vol. 2, Section 4.10 Air Quality, Impact 4.10.1, pp. 4.10-23 through 4.10-29), total construction period emissions for all criteria air pollutants, except fugitive dust, were found to be less than significant because they would be well below the regulatory thresholds. Even with the slight increase in equipment activity that might occur at the secondary core borrow area, total project construction emissions would remain below the regulatory thresholds. However, fugitive dust emissions were considered significant without implementation of Bay Area Air Quality Management District (BAAQMD) construction control measures. With implementation of

mitigation measures in the Draft EIS/EIR, the potential increase in fugitive dust emission associated with use of the secondary core borrow area would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Section 4.10, Mitigation Measure 4.10.1, pg. 4.10-28 through 4.10-29).

Visual/Aesthetic Resources. The Draft EIS/EIR states that use of the primary core borrow area zone under Alternative 4 would substantially degrade the existing visual character and quality. Use of a secondary core borrow area zone would increase those effects; however, unlike the primary core borrow area zone, there are no public trails upslope of the area that would provide views down to the site. The public recreation areas in the vicinity include the Kellogg Creek picnic area but that is located on the west side of the creek, opposite the borrow site such that views of the site are obscured by the vegetation along the creek corridor as well as topography. The same mitigation measures required for the primary core borrow area would be required at the secondary core borrow area to provide for site restoration in a manner that minimizes long-term visual effects. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Mitigation Measure 4.14.2a, pg. 4.14-33).

Cultural Resources. There are no known historical, archaeological or paleontological resources within the secondary core borrow area zone. This zone was located to avoid or minimize effects to sensitive cultural resources. Like the primary core borrow area zone, the secondary zone lies within an area that has low potential for buried cultural resources or human remains and a moderate potential for paleontological resources. Use of the secondary core borrow area would not change the extent of impact to known cultural resources, but because of the potential to disturb more surface area, there would be an increase in potential to encounter unknown cultural and paleontological resources during excavation. With implementation of mitigation measures in the Draft EIS/EIR, these impacts would remain Less-than-Significant with Mitigation. (See Draft EIS/EIR, Vol. 2, Mitigation Measures 4.16.1a through 4.16.1h, pp. 4.16-48 through 4.16-50; Mitigation Measures 4.16.2a and 4.16.2b, pp. 4.16-50 through 4.16-51; and Mitigation Measure 4.16.3, pg. 4.16-55).

Summary of Effects

The addition of a secondary core borrow area zone under Alternative 4 would potentially result in increased impacts to soils, local hydrology, biological resources, air quality, visual/aesthetic resources, and cultural resources as compared to the analysis of impacts assuming only the primary core borrow area zone would be disturbed under Alternative 4 in the Draft EIS/EIR. However, there would be no new or substantially more severe environmental impacts associated with this addition under Alternative 4 and no changes in level of significance for any impact conclusions. The mitigation presented in the Draft EIS/EIR still applies and remains sufficient to reduce core borrow area related impact levels to Less-than-Significant with Mitigation.

Summary of Environmental Consequences Associated with Facilities Description Refinements

In summary, the project description refinements would result in both increases and decreases in environmental effects in select resource areas in comparison to the project alternatives evaluated in the Draft EIS/EIR. Under Alternative 4, the Westside Trail Realignment and the addition of the secondary core borrow area zone would both result in increased impacts to select resources, as described above. However, all of the potentially significant impacts associated with the refinements are similar to those already discussed in the Draft EIS/EIR and would be reduced to less than significant with existing mitigation measures presented in the Draft EIS/EIR. None of the refinements would result in new significant impacts.

2.3.2 Operations Update

CCWD and Reclamation, with assistance from the California Department of Water Resources (DWR), have reviewed the assumptions regarding Delta water supply operations used in the Draft EIS/EIR in light of recent changes in the regulatory environment affecting Delta resources and in light of comments on the Draft EIS/EIR. In response to these factors, analysis of Delta water resources, water quality, fisheries and aquatic resources conducted for the Draft EIS/EIR has been updated for the Final EIS/EIR to incorporate regulations influencing the affected environment and project assumptions that have occurred since the analysis presented in the Draft EIS/EIR was completed, as well as other modifications made in response to comments on the Draft EIS/EIR. The updates from the Draft EIS/EIR analysis that have been included in the modeling analysis performed for the Final EIS/EIR include:

- **An updated presentation of the 2008 U.S. Fish and Wildlife Services (USFWS) Operations Criteria and Plan (OCAP) Biological Opinion (BO) (USFWS, 2008) effects on Delta operations is included in the updated modeling analysis.** On December 15, 2008, USFWS issued an OCAP BO for delta smelt and its critical habitat governing the coordinated operations of CVP and State Water Project (SWP). The terms of the USFWS OCAP BO require changes to the prior operation of the CVP and SWP in the Delta. While this Biological Opinion was released prior to publication of the Draft EIS/EIR, the resulting changes in CVP and SWP operations had not yet been incorporated into the CalSim II model; instead two sets of assumptions were used in the Draft EIS/EIR (moderate restrictions and severe restrictions) to bracket the potential effects of the BO. To ensure that the modeling analysis of the Los Vaqueros Reservoir Expansion Project more precisely captures any effects of the project alternatives resulting from the operation of the CVP and SWP under the OCAP BOs, the analyses performed for this Final EIS/EIR have been updated to reflect the 2008 USFWS BO using CalSim II studies completed in August 2009 that incorporate the requirements of the OCAP BOs.
- **The effects of the 2009 National Marine Fisheries Service (NMFS) OCAP BO (NMFS, 2009) on Delta and upstream reservoir operations are included in the updated modeling analysis.** On June 4, 2009, the NMFS issued an OCAP BO for listed anadromous fish and marine mammal species and their critical habitats, including the Delta. The terms of the NMFS OCAP BO require changes to the prior operation of the CVP and SWP in the Delta. These changes to background conditions are now incorporated into the CalSim II model, and have been included in the updated modeling analysis presented in this section.

- **Assumptions about regulation of Old and Middle River (OMR) flow have been updated to reflect the terms of the USFWS and NMFS OCAP BOs.** The modeling analysis for the Draft EIS/EIR included restrictions on CVP and SWP exports from the Delta that were based on terms in the December 2007 court order in *NRDC vs. Kemphorne* (NRDC, et al, 2007), as modified to include further OMR flow requirements anticipated to be required for protection of longfin smelt. Due to uncertainty about future implementation of OMR flow restrictions at the time the Draft EIS/EIR analysis was performed, a bracketed approach was used in that analysis in which the best available information was used to predict the likely high and low bounds for OMR flow restrictions (moderate and severe restrictions). The analysis performed for the Final EIS/EIR incorporates updated modeling of CVP and SWP operations under the USFWS and NMFS OCAP BOs, which both include restrictions on OMR flows. Diversions at the CCWD Old River and AIP Intakes are included in the calculation of OMR net flow within the CalSim II model. The bracketed approach was not used in the CalSim II modeling for the Final EIS/EIR. Remaining uncertainty regarding the implementation of OMR flow restrictions, which are adaptively managed based on real-time Delta water quality and fishery monitoring, is addressed in the Final EIS/EIR analysis through the use of multi-year model simulations, which capture a range of operations and potential effects.
- **Operations of the Los Vaqueros Reservoir Expansion Project were modified in response to comments received on the Draft EIS/EIR.** Both of the OCAP BOs described above contain new regulations on flow in OMR that are designed to protect the Delta fisheries. The studies include modeling assumptions that capture the export restrictions based on OMR flow. Operational assumptions have been updated for Alternatives 1 and 2 of the Los Vaqueros Reservoir Expansion Project so that increased diversions for Delta Supply Restoration or Dedicated Storage of Environmental Water are not made for those project alternatives when the new OMR flow regulations are controlling CVP and SWP exports from the Delta. Operations for Delta Supply Restoration and additional Dedicated Storage for Environmental Water are not included in Alternative 4; therefore, this updated assumption did not affect the analysis of Alternative 4.
- **Operational requirements from the new CCWD California Department of Fish and Game (CDFG) Incidental Take Permit (ITP) (CDFG, 2009) are included in the updated analysis.** In connection with permitting for the CCWD Alternative Intake Project (AIP), on November 5, 2009, the CDFG issued an ITP for CCWD operations. This permit governs all CCWD operations in the Delta, and includes an extension to the no fill period for Los Vaqueros Reservoir. This modification is included in the updated analysis presented in this section.
- **The Rock Slough Fish Screen is assumed to be implemented under 2005 level of development with-project conditions and under 2030 level of development with- and without-project conditions.** As described in 3.1.3 of the Final EIS/EIR (Vol. 4, Section 3.1, Master Response 1: Project Purpose and Description), the Rock Slough Fish Screen is under construction; operation is scheduled to begin in 2011. Accordingly, the operation of the Rock Slough Fish Screen is included in model simulations of the project alternatives, and is also included in the Future Without Project condition. The Rock Slough Fish Screen is not included in model analysis of the Existing Condition because it was not approved when environmental review commenced.
- **Operational coordination between CCWD, Reclamation and DWR is included in the updated analysis based upon recent agency consultations.** CCWD, Reclamation and DWR have reviewed Delta water supply operations in light of the recently issued OCAP BOs and in light of comments on the Draft EIS/EIR, and have developed a potential set of

modified operations for CCWD that improve overall coordination of Delta water operations, while maintaining water supply and water quality for CCWD, CVP and SWP. Operations include:

- The 75 to 90 day no fill period for Los Vaqueros Reservoir would be implemented in half or all of February and all of March and June, and the 30-day CCWD no diversion period would be implemented in March. This reduces the potential influence of filling Los Vaqueros Reservoir when OMR flow restrictions govern Delta operations. This operational modification is subject to consultation with USFWS, NMFS, and CDFG.
- During periods when OMR flow restrictions occur, the screened Rock Slough Intake would be used to the maximum extent possible for direct diversions to CCWD customers while maintaining the chloride delivery goal.
- Releases from Los Vaqueros Reservoir would be minimized from October through December, while still maintaining the chloride delivery goal for CCWD customers. Los Vaqueros Reservoir also would be filled during this period when water quality allows.
- When diversions from the Freeport Intake are available to CCWD pursuant to the agreement with the East Bay Municipal Utility District (EBMUD) for shared use of this intake, these diversions would be used to fill Los Vaqueros Reservoir whenever other Delta water quality and CCWD operational conditions allow. This minimizes the potential effect of filling Los Vaqueros Reservoir on OMR flow.

These modified operations are included in the updated analysis of Alternatives 1, 2 and 4 conducted for the Final EIS/EIR that resulted in updates to the Draft EIS/EIR Sections 4.2 and 4.3 which are presented in Section 5.3 of this Final EIS/EIR (Vol. 4). The updated Section 4.2 presents modeling methodology and results of the analysis of potential effects on Delta hydrology and water quality, based on the updated modeling analysis performed for the Final EIS/EIR. The updated Section 4.3 presents modeling methodology and results of impacts analysis for Delta fisheries and aquatic resources. Additional information on modeling methodology and results for these updated analyses are presented in the updated Appendix C (Vol. 4 on CD).

The results of the updated analysis indicate that the analysis used in the Draft EIS/EIR captured the environmental impacts associated with the project alternatives. The updated modeling does not indicate any new or substantially more severe significant impacts on Delta water quality and aquatic resources. The coordinated operations evaluated in the Final EIS/EIR would further minimize the potential for the expansion project to adversely affect other CVP and SWP operations.

2.4 Variant to the 275-TAF Reservoir Alternatives

2.4.1 Overview

Although the Draft EIS/EIR evaluates project alternatives to either expand the reservoir to 275 TAF or 160 TAF, current circumstances surrounding water system operations and habitat conservation in the Delta raise the need to consider and disclose the effects that might occur under a variant to the 275-TAF reservoir alternatives (timing variant) such that the reservoir could first be expanded

to 160 TAF and then the lead agencies may later consider whether to further expand the reservoir to 275 TAF. Because such a scenario is reasonably foreseeable, an evaluation of the potential effects of this timing variant is presented in this document (Final EIS/EIR, Vol. 4). This analysis recognizes that CCWD has immediate and urgent needs to take actions that protect its water supply quality and reliability, while Reclamation and other potential partners in a 275-TAF reservoir need to complete studies on broader Delta water system evaluations, including potential new Delta conveyance projects under the BDCP, before they determine whether and which Los Vaqueros Reservoir expansion alternative best meets their needs and objectives.

Current conditions in the Delta have affected CCWD's ability to maintain reliable, high-quality water supplies for its customers during dry years. Anticipated future limitations on dry year water transfers and declines in Delta water quality create immediate needs for CCWD to improve its dry year water supply and water quality reliability (see Draft EIS/EIR, Chapter 1, pg. 1-8). At the same time, Reclamation is in the midst of studying long-term solutions to water supply conveyance through the Delta and habitat restoration and protection. The results of these studies could affect the federal interest in the larger expansion alternatives for the Los Vaqueros Reservoir for statewide and national benefit.

Expansion of Los Vaqueros Reservoir to 160 TAF would not preclude further expansion of the reservoir to 275 TAF. Expansion of Los Vaqueros Reservoir to 160 TAF would address water supply reliability and water quality needs of CCWD and potentially one or more local partners. If the lead agencies subsequently decide to further expand the reservoir, a 275-TAF reservoir could provide regional water supply reliability and statewide environmental benefits in partnership with appropriate federal, state, and/or local agencies. **Table 2-5** summarizes the key assumptions associated with implementation of such an enlargement; these assumptions are discussed in more detail below. For evaluation purposes, the minimum time period anticipated between completion of a 160 TAF reservoir and initiation of construction of a possible further expansion to 275 TAF is estimated to be seven years or more.

2.4.2 Expansion to 160 TAF

Design, construction, and operation of the 160-TAF reservoir expansion would be the same as Alternative 4 as described in the Draft EIS/EIR, as refined and described in Section 2.3, above. Construction of the 160-TAF reservoir expansion would be expected to commence as early as 2011 and continue for 18 to 24 months through 2012, with operation beginning in 2013.

2.4.3 Expansion to 275 TAF

The facilities constructed to expand the 160-TAF reservoir to 275-TAF would be the same facilities described in the Draft EIS/EIR under Alternative 1, but less dam construction would be needed because the dam would already have been raised for the 160-TAF reservoir. Further expansion of the dam facility from the 160-TAF reservoir to the 275-TAF reservoir would largely involve activity at the top and upstream side of the dam. The downstream outer shell of the dam would not need to be modified. The top shell of the dam would be removed to allow expansion of the core and then the shell would be rebuilt over the top and upstream side of the dam. As a

TABLE 2-5
KEY ASSUMPTIONS FOR TIMING VARIANT

Project Element	160-TAF expansion (same facilities and operations as Alternative 4)	Expansion from 160 TAF to 275 TAF (same facilities and operations as Alternative 1)
Construction period	2011 – 2012	2019 – 2022
Begin Operation	2013	2023
Reservoir Capacity	160 TAF	275 TAF
Dam Modification	Raise existing dam for 160-TAF reservoir Requires only partial water level drawdown in reservoir	Raise dam for 275-TAF reservoir Requires complete draining of reservoir Would use most of 160-TAF dam structure, with some modification at the top of the dam
Borrow Area	Acquire clay from within Los Vaqueros watershed from one or both of two borrow areas	Acquire additional clay materials from within drained reservoir area
Dam Spillway	Construct for 160-TAF capacity	Reconstruct during dam reconstruction for 275-TAF capacity
Inlet/Outlet Facilities	Modify existing outlet facility to extend above the 160-TAF reservoir maximum storage elevation	Construct new inlet and outlet facilities
Old River Intake and Pump Station	No Action	No Action
New Delta Intake and Pump Station	No Action	Acquire land, construct
Delta – Los Vaqueros Pipeline	No Action	Acquire additional right-of-way where needed; construct new parallel pipeline
Transfer Station	Upgrade likely (install new pumps to support a 160-TAF reservoir)	Construct expanded facility
Transfer – Los Vaqueros Pipeline	No Action	Construct new parallel pipeline
Transfer – Bethany Pipeline/Bethany Reservoir Connection	No Action	Acquire ROW; construct new pipeline
Los Vaqueros Reservoir Marina	Keep on south end of reservoir; move facilities upslope	Relocate to north end of reservoir and construct new facilities
Interpretive Center	No Action	Construct second new center
Picnic areas, Restrooms	Replace/increase in accordance with Alt. 4 project description	Replace/increase in accordance with Alt. 1 project description
Trails	Replace/increase in refined project description	No additional action anticipated
Habitat Impact Mitigation	Mitigate/compensate for 160-TAF reservoir impacts inside and outside watershed	Mitigate for additional habitat impacts of expanding from 160 TAF to 275 TAF
Agricultural Impact Mitigation	No Action	Mitigate for farmland loss at the new Delta Intake Facility
Power Facilities	No Action	Construct new substation and power lines under either the Western Only or Western – PG&E scenarios
Water Rights Modifications	For 160 TAF, as needed	For 275 TAF, as needed

SOURCE: ESA, 2009

result, most of the additional construction activity and disruption would occur upstream of the dam within the reservoir bed. For the purposes of this analysis, construction of a possible further expansion to 275 TAF is assumed to commence in 2019 (or later) and continue for approximately 3 to 4 years and commence operation in 2023 (or later) after reservoir refill. The reservoir would be out of operation and closed to public access for an additional period of approximately four years during construction.

2.4.5 Environmental Assessment of Possible Timing Variant

Expansion of the Los Vaqueros Reservoir from the current 100 TAF first to 160 TAF and subsequently to 275 TAF (if later approved) was evaluated to determine if and how environmental impacts might be different from those described in the Draft EIS/EIR for the 275-TAF expansion represented here by Alternative 1. While the types of environmental impacts associated with reservoir expansion would not be different under the timing variant from those described in the Draft EIS/EIR for Alternative 1, the following discussion evaluates the potential for the extent of some impacts to change as a result of two rounds of construction to implement expansion of the reservoir first to 160 TAF and then (possibly) to 275 TAF. Note that impacts associated with the timing variant also are detailed in Appendix B (Vol. 4). Under a timing variant, the only two locations where two rounds of construction activity would occur would be at the dam site (including at the inlet/outlet facilities) and at the marina facilities. When expanding the reservoir to 160 TAF, the existing marina facilities would be relocated upslope from their current location on the southern reservoir shoreline in order to move out of the inundation footprint of the 160-TAF expansion. If the reservoir were further expanded to 275 TAF, the marina facilities would be moved to a new location at the northern end of the reservoir.

for Alternative 1, the following discussion evaluates the potential for the extent of some impacts to change as a result of two rounds of construction to implement expansion of the reservoir first to 160 TAF and then (possibly) to 275 TAF. Note that impacts associated with the timing variant also are detailed in Appendix B (Vol. 4). Under a timing variant, the only two locations where two rounds of construction activity would occur would be at the dam site (including at the inlet/outlet facilities) and at the marina facilities. When expanding the reservoir to 160 TAF, the existing marina facilities would be relocated upslope from their current location on the southern reservoir shoreline in order to move out of the inundation footprint of the 160-TAF expansion. If the reservoir were further expanded to 275 TAF, the marina facilities would be moved to a new location at the northern end of the reservoir.

Construction of conveyance pipelines and a new Delta intake would only occur if the reservoir were expanded from 160 TAF to 275 TAF. Impacts associated with construction of the conveyance and intake facilities under the timing variant would be the same as those described under Alternative 1.

Finally, a timing variant would necessitate use of the borrow area sites required for the 160-TAF expansion and also use of the borrow sites required for the 275-TAF expansion. For the 160-TAF expansion, clay materials for use in expanding the dam core must be taken from borrow sites located about two miles downstream of the dam in the Kellogg Valley corridor. If the 160-TAF reservoir were later expanded to 275 TAF, additional clay materials to further expand the dam core would be

taken from the bed of the reservoir once it was drained. The timing variant would affect more total acreage for borrow materials than reservoir expansion under either Alternative 4 or Alternative 1 alone.

In summary, there are three circumstances in which a timing variant might have impacts that are the same type but somewhat greater than those described for Alternative 1 in the Draft EIS/EIR: 1) areas at the dam site and at the southern marina location where ground disturbance would occur twice; 2) effects associated with two rounds of construction activity (e.g., construction traffic at two different periods, and closure of the watershed twice to recreational use); and 3) additive footprint impacts associated with the need to use borrow area sites associated with both the 160-TAF expansion and, if later approved, the 275-TAF expansion.

Areas Disturbed Twice

By conducting construction activities twice at the dam and at the southern marina, the vegetation affected in these two areas (primarily grassland, which supports a variety of special status and common wildlife species) would be disturbed twice.

For Pacific Flyway species, including waterfowl and shorebirds, only the second phase of reservoir expansion to 275 TAF would require draining the reservoir. Effects on these species under the timing variant would be the same as those analyzed for Alternative 1.

As described in the Draft EIS/EIR, impacts to habitat lost or disturbed in these two facility areas would be mitigated to less than significant through a combination of measures to reduce impact to the habitat and the species during construction, to restore grassland vegetation in these onsite areas following construction and to compensate with land acquisition, protection and enhancement outside the watershed for habitat that supports sensitive species, such as the San Joaquin kit fox. With a minimum seven-year period between completion of the 160-TAF reservoir expansion and the possible later start of the further expansion to 275 TAF, these grassland areas would have sufficient time to revegetate. Thus, a timing variant would not result in effects to more land, but it would result in two rounds of impact. Therefore, under the timing variant, habitats disturbed twice by construction would be mitigated for twice, applying the compensation ratio for temporary habitat disruption of sensitive species habitat, which is 1.1:1, to both rounds of construction. This would provide additional compensatory acreage to address the additional temporary habitat disruption resulting from a timing variant and reduce this impact to less than significant. All other mitigation measures identified in the Draft EIS/EIR to minimize construction impacts to biological resources would also be implemented during each period of reservoir expansion.

Under the timing variant direct and indirect construction-related impacts on listed vernal pool fairy shrimp and their habitat, and on the non-listed midvalley fairy shrimp and curved-foot hygrotus diving beetle or designated critical habitat for listed species (vernal pool fairy shrimp and Contra Costa goldfields) would only occur during expansion of the reservoir from 160 TAF to 275 TAF as analyzed under Alternative 1. There would be no change in effects relative to Alternative 1 and therefore no change in impact conclusions or mitigation requirement for the timing variant.

Other impacts associated with earthwork and ground disturbance in these two areas, such as erosion or temporary effects on local drainage patterns during earthwork, would occur twice under the timing variant but would not result in additive impacts that are greater or more severe than those analyzed and addressed in the Draft EIS/EIR. Mitigation measures identified to reduce these short-term impacts to less than significant would be implemented in both periods of reservoir expansion.

Other Impacts from Two Construction Periods

With respect to the impacts associated with two periods of construction activity, no substantial increase in effects would occur because the two construction periods are expected to be a minimum of seven years apart in time. Construction traffic associated with a 160 TAF reservoir expansion would be of a relatively short duration because most of the construction activity would occur within the watershed. If the 160-TAF reservoir were later expanded to 275 TAF, construction impacts, (both in general and insofar as they affect communities of concern as described in Section 4.18 of the Draft EIS/EIR), would generally be as described for Alternative 1, with slightly less construction traffic associated with the dam component because the dam would have been partially raised to construct the 160-TAF reservoir. The project region would experience construction traffic congestion over the 18 to 24-month construction period for the 160-TAF expansion after which the project's contribution to traffic congestion would end. Seven years or more later the project would contribute to another period of traffic congestion associated with construction of a further expansion to 275 TAF. Mitigation measures identified in the Draft EIS/EIR to reduce the effects of project construction traffic would be applied during each stage. This situation would be similar for effects associated with construction and construction traffic, specifically air quality emissions (including greenhouse gas emissions) from construction vehicles and equipment, dust, and noise. These effects would occur twice in the project area but given the time separation of at least seven years between the two construction periods, the effects would not be additive.

A timing variant would require two periods of closure of public recreation activities at the watershed during the two separate construction periods, a minimum of seven years apart. As discussed in the Draft EIS/EIR, because there are numerous alternative recreation opportunities in the project region available to the public, such closures would not result in significant impacts on recreational facilities after mitigation. A timing variant would not alter this impact conclusion.

Borrow Areas

A timing variant would increase the extent of area affected for borrow materials for dam modification. For the 160-TAF reservoir expansion, clay material for the dam core would be taken from sites downstream of the dam in the Kellogg Creek valley. Total area to be excavated for borrow materials will be determined based on testing of the subsurface clay materials, but two borrow areas have been identified and the surface area affected during the construction of a 160-TAF reservoir expansion could range from 46 to 87 acres. If the 160-TAF reservoir were later expanded to 275 TAF, additional core material would be excavated from the bed of the reservoir once it is drained. By contrast, if the reservoir were expanded to 275 TAF in the first instance, then all of the dam core borrow materials could come from the reservoir bed, which would have fewer

biological resource impacts than excavating the materials from borrow areas downstream of the reservoir in the valley. Material for the shell still would be obtained from the borrow area adjacent to the left abutment. The shell material for the 160-TAF expansion would remain in place for a later expansion to 275 TAF so the volume needed for the subsequent expansion would be reduced by the amount already used to construct the 160 TAF. There would be no increase in the area disturbed under the timing variant.

As a result, a timing variant results in about 46 to 87 acres of additional grassland disturbance within the watershed than would Alternative 1. In this case, a timing variant would increase the acreage of project impact, but this additional acreage does not represent a substantial increase in the severity of project impact from that described in the Draft EIS/EIR. Alternative 1 would result in loss of about 1,500 acres of grassland, primarily associated with the expanded reservoir inundation area, but also including the siting effects of all other facilities inside and outside the watershed. The additional 46 to 87 acres of grassland impact that would result from a timing variant represents an increase in the acreage of grassland affected of less than six percent. The physical impact to the grassland at the borrow areas used to construct a 160-TAF expansion would be mitigated at the time the 160-TAF expansion is implemented. Because possible later expansion to 275 TAF would not result in a new physical disturbance of these areas, additional mitigation would not be required.

In addition, use of these additional borrow areas could also result in impacts to cultural resources, biological resources, and aesthetics that were described as part of the impacts associated with Alternative 4 but would not have occurred under Alternative 1. For construction of the 160-TAF reservoir both primary and secondary core borrow area zones have been identified (See Section 2.3.1, above for a description of the secondary borrow area). Both borrow areas are located downstream of the dam in the Kellogg Creek valley where clay material necessary to construction of the expanded dam core occurs. Both borrow areas were located so as to avoid known cultural resources sites and both are located in areas considered to have low potential for such resources. Thus there would no increase in impacts to known cultural resources but some potential for additional discovery and impact to unknown resources as a result of construction activity in these additional borrow areas under the timing variant.

With respect to visual resources, both core borrow areas for the 160-TAF expansion are located on the other side of Kellogg Creek from Walnut Boulevard and adjacent public use areas where views of the sites are screened by vegetation along the creek and topography. The primary core borrow area zone, however, can be viewed from a public trail upslope of the site, and consequently, disturbance of this area would affect visual resources from this viewpoint. There is no public access or trails that provide similar views of the secondary core borrow area zone. Mitigation measures are presented in the Draft EIS/EIR to reduce impacts in both these areas to less than significant, and these measures would be implemented with implementation of the 160-TAF expansion.

2.5 Environmentally Superior Alternative and Environmentally Preferable Alternative

CEQA directs an EIR to identify an environmentally superior alternative from among the alternatives evaluated. Alternative 4 represents the smaller option for reservoir expansion, increasing storage capacity from the existing 100 TAF to 160 TAF, rather than the larger expansion to 275 TAF proposed under Alternatives 1, 2 and 3. Implementing the smaller reservoir expansion results in less inundation of habitat and less disruption of the watershed. Alternative 4 also does not involve construction or modification of facilities outside the CCWD watershed as do the other three alternatives; specifically, Alternative 4 does not include construction of major new facilities such as the new Delta Intake and Pump Station, the Delta-Transfer Pipeline, the Transfer-LV Pipeline, the expanded Transfer Facility, or the South Bay Connection. Consequently, Alternative 4 results in less environmental impact than the other three alternatives evaluated. As a result, Alternative 4 represents the environmentally superior alternative.

Alternative 4 does not meet the project objectives as fully as the other alternatives, particularly Alternatives 1 and 2, and it does not provide the same level of benefit as these alternatives. However, it does achieve the project objectives of improving water supply reliability and water quality for CCWD's customers, who face existing and growing threats to both water supply reliability and quality. Alternative 4 also provides some environmental water management improvement as the additional storage capacity provides greater operational flexibility for CCWD.

Section 1505.2(b) of the 40 CFR requires that the environmentally preferable alternative be identified in the Record of Decision (ROD). Reclamation will identify the environmentally preferable alternative when it issues the ROD for this action.

2.6 Reclamation Preferred Alternative

In the context of broader water system modifications now under evaluation, Reclamation may ultimately decide that a 275-TAF Los Vaqueros Reservoir best meets its needs and objectives. The ongoing water system evaluation involves other potential project partners and other potential new Delta conveyance projects, and requires additional time to evaluate. Based on the assessment in this Final EIS/EIR, and recognizing that implementation of Alternative 4 would not preclude subsequent approval of a 275-TAF reservoir, Reclamation's preferred alternative is Alternative 4.