Chapter 4
Final Alternatives

This chapter describes the No Action Alternative, and the alternative plans evaluated in the draft Supplement and this Feasibility Report. The numbering of the action alternatives for the Phase 2 Expansion correlates, in terms of operational priorities and major features, with Alternatives 1, 2 and 4 analyzed in the 2010 Final EIS/EIR (see Table 4-1). The action alternatives are formulated to capture the full range of potential project operations to best meet the needs of the various Local Agency Partners as well as the Refuges identified in the CVPIA. All action alternatives would continue to provide CCWD with the benefits of the original Los Vaqueros Project and already-completed expansion of Los Vaqueros Reservoir to 160 TAF storage capacity, and also provide benefits of improved water supply reliability to the Local Agency Partners and Refuges.

Table 4-1. Comparison of Phase 2 Expansion No Action and Final Alternatives to the Alternatives Included in the 2010 Final EIS/EIR

Phase 2 Final Alternative	Phase 1 2010 Final EIS/EIR Alternative	Notes
N/A	No Action	Original 100 TAF reservoir.
No Action	Alternative 4	Implemented as phase 1 expansion of Los Vaqueros Reservoir. Timing variant implementation is covered in the 2010 Final EIS/EIR. Operations focused on CCWD water quality and dry-year reliability.
Alternative 1A	Alternative 1	Same operational focus (water supply reliability), 275 TAF reservoir, refined facilities and sizing, and refined operations.
Alternative 1B	Alternative 1	Similar operational focus (water supply reliability, balanced with environmental water management), 275 TAF reservoir, refined facilities and sizing, and refined operations.
Alternative 2A	Alternative 2	Same operational focus (environmental water management), 275 TAF reservoir, refined facilities and sizing, and refined operations.
N/A	Alternative 3	Screened out in the Final 2010 EIS/EIR due to significant impacts.
Alternative 4A	Alternative 4	160 TAF reservoir, added conveyance to Bethany Reservoir, refined facilities and sizing, and refined operations. Operational focus similar to Alternative 1B (water supply reliability, balanced with environmental water management).

Key:
CCWD = Contra Costa Water District
EIS/EIR = Environmental Impact Statement/Environmental Impact Report
N/A = not applicable
TAF = 1,000 acre-feet

No Action Alternative

The No Action Alternative represents a projection of reasonably foreseeable future conditions that could occur if no action alternatives are implemented (i.e., the future without the proposed project). Reclamation recommends several criteria for including proposed future actions within the No Action Alternative; proposed actions should be (1) authorized; (2) approved through completion of NEPA, CEQA, and ESA compliance processes; (3) funded; and (4) permitted.

Under the No Action Alternative, the Federal Government would continue to implement reasonably foreseeable actions, as defined above, but Reclamation and CCWD would not take additional actions toward implementing the second phase of Los Vaqueros Reservoir expansion to help improve water supply reliability and environmental water management. The No Action Alternative is considered the basis for comparison with the final comprehensive alternative plans, consistent with NEPA and the P&G (WRC 1983) guidelines. Therefore if no proposed action is determined feasible, the No Action Alternative is the default option. Facilities included in the No Action Alternative are shown on Figure 4-1.

For the purpose of this Feasibility Report, the action that was implemented by CCWD following certification of the 2010 Final EIS/EIR, Alternative 4, is the existing condition and is used to represent the No Action Alternative. CCWD would continue operating the 160 TAF Los Vaqueros Reservoir and other CCWD facilities to deliver water to meet its customer demands and delivered water quality goal subject to current regulatory and physical constraints. This alternative would not change operations of the Los Vaqueros Reservoir system, and no new facilities would be constructed. The Local Agency Partners and Refuges operations would likewise be unchanged, and their water supply reliability would not be improved through use of the existing Los Vaqueros Project, except through separate partnership agreements that could be developed in the future but are not contemplated in this analysis.

The following describes the operating rules used to simulate the No-Action Alternative. These operations are used in the alternatives also, unless otherwise noted:

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

- Diversion of water for direct deliveries to CCWD under CCWD’s CVP water supply contract, under CCWD’s long-term transfer agreement with ECCID, or as one-time transfers.

- Diversion of water to storage in Los Vaqueros Reservoir for CCWD purposes under CCWD’s Los Vaqueros water right permit or under CCWD’s CVP water supply contract.

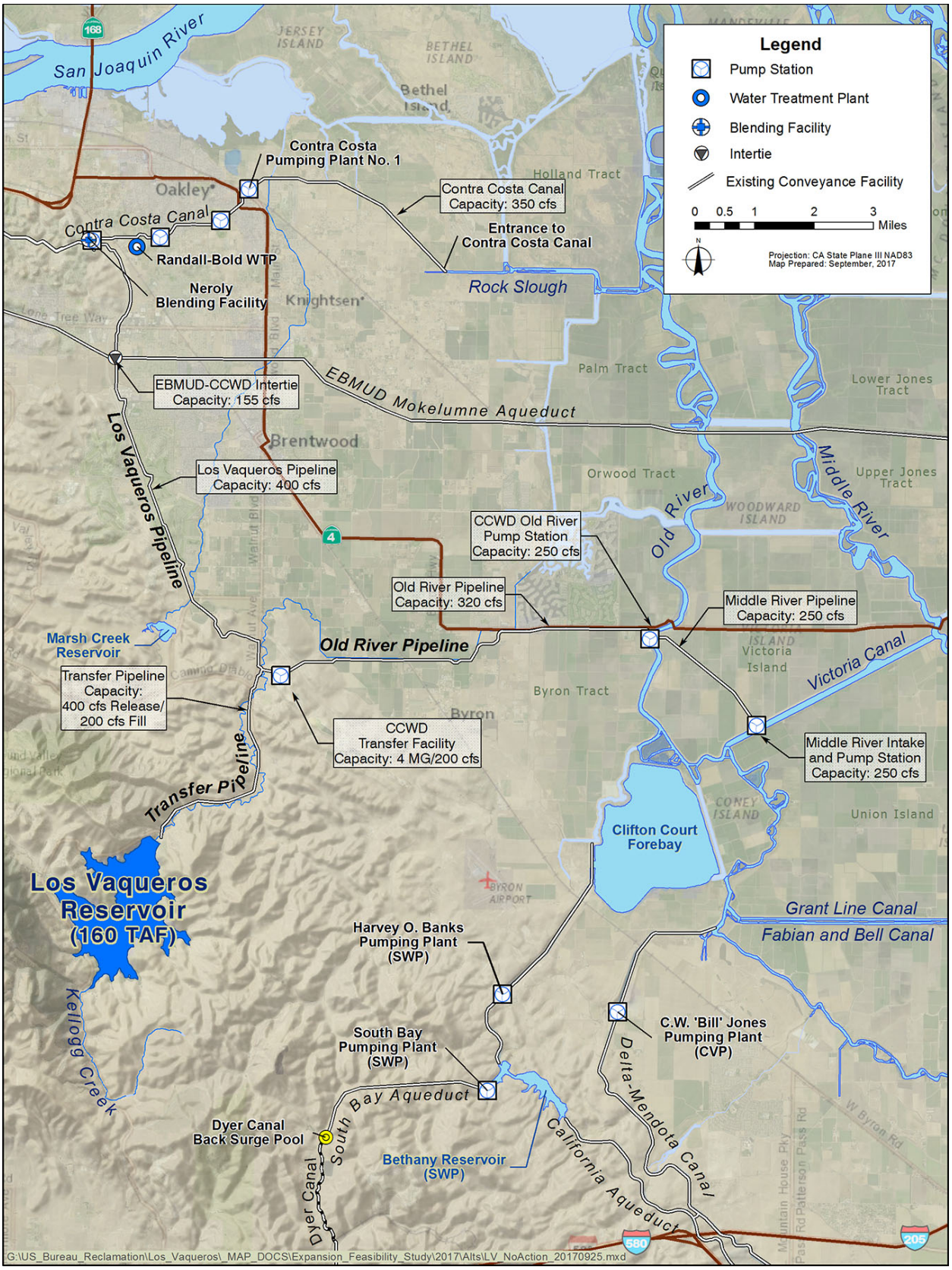


Figure 4-1. Existing Facilities of the No Action Alternative

- Diversions to Los Vaqueros Reservoir storage from the Old River Intake and Middle River Intake at Victoria Canal do not take place when Old and Middle River flow restrictions are controlling CVP and SWP south Delta export operations under the 2008 USFWS BO (USFWS 2008) and 2009 NMFS BO (NMFS 2009). This fisheries-related restriction is in addition to the no-fill/no-diversion period requirements specified in the existing biological opinions for Los Vaqueros Reservoir operations.

- The default timing specified in the Los Vaqueros BOs and Incidental Take Permit (USFWS 1993; NMFS 1993; CDFW 2009) of March 15 through May 31 for the no-fill period, with a concurrent no-diversion period in April, was assumed to be shifted to the first half of February and all of March and June for the no-fill period, with a concurrent no-diversion period in March. This shifted timing better coordinates Los Vaqueros Reservoir filling operations with CVP and SWP operations under the Long Term Operation of the CVP and SWP BOs, since the limit on the ratio of San Joaquin River inflow to exports often controls CVP and SWP exports in April and May, rather than Old and Middle River flow restrictions, and CCWD diversions are considered to be in-Delta diversions and therefore not included in total exports.

Environmental Water Management

Under the No Action Alternative, no environmental water management supplies or benefits would be provided through expansion of the Los Vaqueros Project. No additional water supplies would be available to Refuges from Los Vaqueros Reservoir. If Reclamation decided to pursue additional Refuge supplies, Reclamation would have to do so by other means, such as water transfers or constructing new storage and conveyance elsewhere. During drought periods, in particular, Refuge water supplies would continue to be subject to current limitations for acquiring water on the open market, including lack of available statewide water supplies (particularly in dry years) and increasing prices for water acquired on the open market.

Water Supply Reliability

Demands for water in the Bay Area and throughout California exceed available supplies, particularly during dry years, and these shortage conditions are expected to intensify in the future. Under the No Action Alternative, demands would continue to be met at levels similar to or lower than existing conditions. CCWD would continue to operate and maintain its existing facilities to deliver reliable water supply to its customers, and to provide water supplies to other Local Agency Partners when available, at levels similar to existing conditions. CCWD would also continue to 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 Action Alternative.

Under the No Action Alternative, no new pipeline connection to Bethany Reservoir would be constructed to allow additional operational flexibility to provide SBA and other SOD water supplies. No new emergency storage would be provided at Los Vaqueros Reservoir for use by Local Agency Partners. Local Agency Partners receiving water from the Delta through the SWP or CVP would continue to pursue actions independently to improve water supply reliability under separate environmental impact review, in accordance with CEQA and NEPA. As there are few suitable locations in the Bay Area to construct new or expanded surface storage, and agencies have experienced difficulty receiving delivery of water supplies they have stored in

SOD groundwater banks, Local Agency Partners would be limited to pursuing local actions to secure reliable supplies and address shortage conditions. These actions include recycled water, desalination, and extreme conservation measures.

Action Alternatives

The final Action Alternatives evaluated in the Feasibility Report are summarized in Table 4-2. These alternatives are refined options of the original four alternatives evaluated in the 2010 Final EIS/EIR and account for changes to existing conditions that have occurred since the 2010 Final EIS/EIR was released (e.g., expansion of Los Vaqueros Reservoir to 160 TAF, completion of other local projects). They also account for changes that are anticipated to take place in the coming years. These alternatives are operated to provide varying levels of emphasis to the above project objectives.

Final Alternatives 1A, 1B, and 2A would expand Los Vaqueros Reservoir storage from 160 TAF to 275 TAF, build a new Delta-Transfer Pipeline, and relocate the existing Marina Complex and Los Vaqueros Watershed trails and access roads that would be inundated by the reservoir expansion. Final Alternatives 1A, 1B, and 2A differ from one another only in the proposed operations of the facilities. Final Alternative 4A does not include expansion of the 160 TAF reservoir or build a new Delta-Transfer Pipeline but would make all of the other major physical improvements identified for Final Alternatives 1A, 1B, and 2A. All of the Final Alternatives, including Alternative 4A, would upgrade the existing Transfer Facility, build a new Transfer-Bethany Pipeline, increase capacity at Pumping Plant #1, and add facilities to deliver water to the Transfer Facility from the Rock Slough Intake, which entails building a new Neroly High-Lift Pump Station.

Figure 4-2 shows the facilities associated with alternatives 1A, 1B, and 2A. Figure 4-3 shows the facilities associated with alternative 4A.

Table 4-2. Summary of Facilities Included in the No-Action and Final Alternatives

	No Action	Alternatives 1A, 1B, 2A[3]	Alternative 4A
Existing Facilities (no change)			
Old River Intake	250 cfs	250 cfs	250 cfs
Middle River Intake	250 cfs	250 cfs	250 cfs
Old River Pipeline	320 cfs	320 cfs	320 cfs
Los Vaqueros Pipeline	400 cfs	400 cfs	400 cfs
Transfer-Los Vaqueros Pipeline (Fill/Release)	200/400 cfs	200/400 cfs	200/400 cfs
EBMUD-CCWD Intertie	155 cfs	155 cfs	155 cfs
Transfer Reservoir	4 million gallons	4 million gallons	4 million gallons
Proposed Modifications to Existing Facilities			
Los Vaqueros Reservoir Capacity	160 TAF	275 TAF	160 TAF
Los Vaqueros Reservoir Maximum Water Surface Elevation	507 feet	560 feet	507 feet
Transfer Pump Station Capacity	150 cfs	200 cfs	200 cfs
Proposed New Facilities			
Transfer-Bethany Pipeline Capacity	None	300 cfs	300 cfs
Delta-Transfer Pipeline Capacity	None	180 cfs	None
Expanded Transfer Facility Pump Station Capacity	None	300 cfs	300 cfs
Expanded Transfer Facility Storage Reservoir Capacity	None	5 million gallons	5 million gallons
Neroly High-Lift Pump Station Capacity	None	350 cfs[1]	350 cfs[1]
Pumping Plant #1 Capacity	200 cfs	350 cfs	350 cfs
Los Vaqueros Watershed Facilities			
Los Vaqueros Marina Complex	No change	Relocated upslope	No change
Los Vaqueros Watershed Trails	None	Expanded	None
Los Vaqueros Interpretive Center	No change	Improved	Improved
Los Vaqueros Watershed Office Barn	No change	Seismically upgraded and improved	Seismically upgraded and improved
Associated Local Projects[2]			
EBMUD Mokelumne Aqueduct relining	None	Included	Included
EBMUD Walnut Creek Pumping Plant Variable Frequency Drives	None	Included	Included
EBMUD-CCWD Intertie Pump Station	None	155 cfs	155 cfs
Brentwood Pipeline	None	Included	Included
ECCID Intertie	None	80 cfs	80 cfs

Note:
[1] Permitted capacity is 350 cfs as defined in the Supplement to the Final EIS/EIR. 300 cfs is the capacity modeled and designed under the Feasibility Study to reflect the current operation requirements.
[2] Local Projects developed separately from the Feasibility Study, but linked to the operations of the project.
[3] Alternatives 1A, 1B, and 2A differ from one another only in the proposed operations of the facilities.
Key:
CCWD = Contra Costa Water District
cfs = cubic-feet per second
EBMUD = East Bay Municipal Utility District
ECCID = East Contra Costa Irrigation District
TAF = 1,000 acre-feet

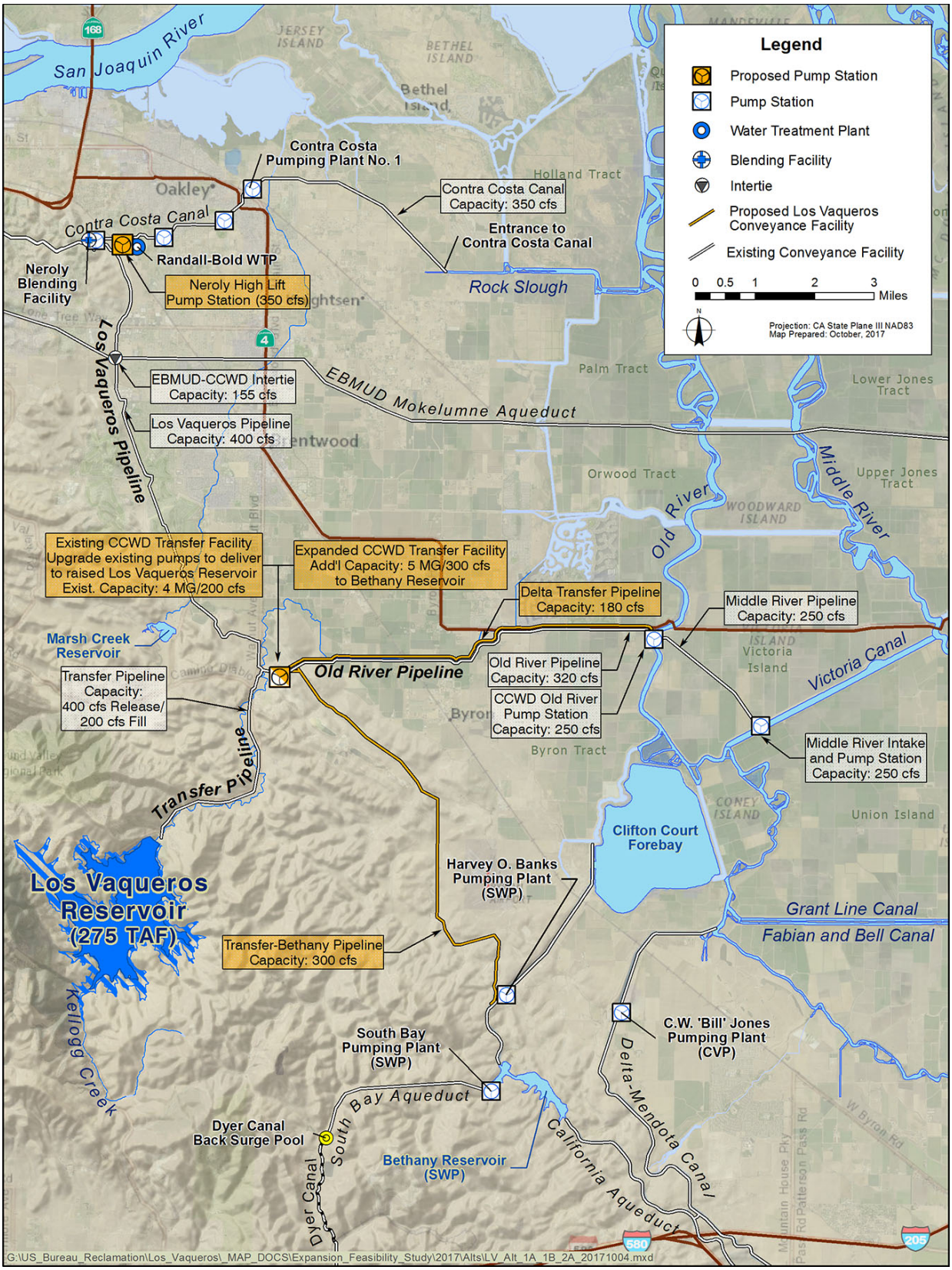


Figure 4-2. Major Components of Final Alternatives 1A, 1B, and 2A

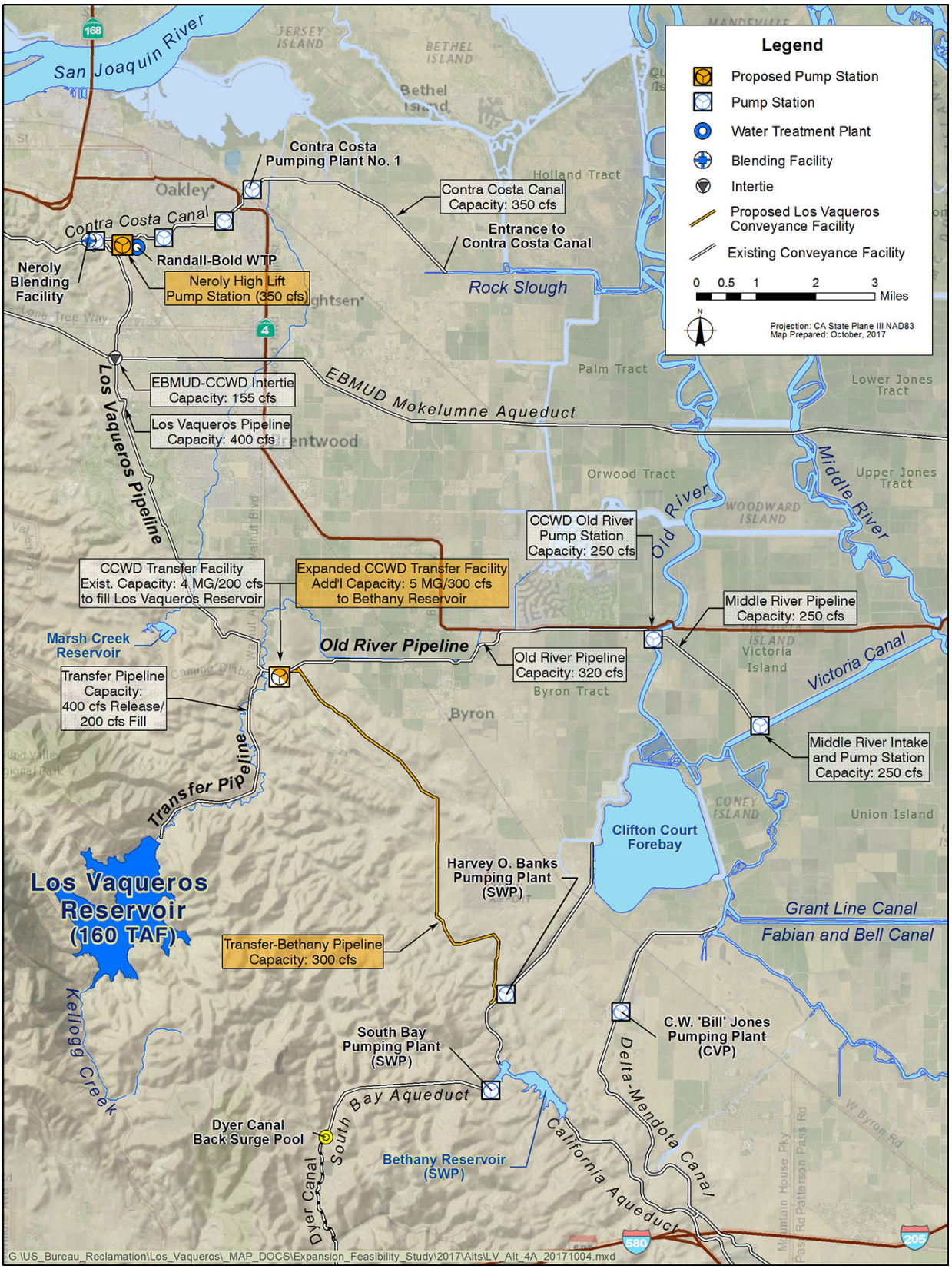


Figure 4-3. Major Components of Final Alternative 4A

Common Operations in Final Alternatives

The following are aspects of the operations that are consistent in all final alternatives.

Rock Slough Filling

The ability to deliver water to the existing Transfer Facility from the existing Rock Slough Intake has been added, so that CCWD would be able to fill Los Vaqueros Reservoir and deliver water to the proposed Transfer Bethany Pipeline from the existing Rock Slough Intake, as well as from the existing Old River and Middle River Intakes and EBMUD-CCWD Intertie. The Rock Slough Intake is, like the Freeport Intake, north of the locations where Old and Middle River flows are measured for the purposes of monitoring CVP and SWP compliance with the 2008 USFWS BO and 2009 NMFS BO. Los Vaqueros Reservoir filling from Rock Slough Intake and deliveries to partners south of the Delta would not be constrained when Old and Middle River flow restrictions control CVP and SWP south Delta export operations. The proposed new Neroly High-Lift Pump Station and replacement of Rock Slough Pumping Plant #1 would be needed to enable this operation.

CCWD No-Fill/No-Diversion Period

The 75- to 90-day no-fill period and concurrent 30-day no-diversion period required by the 1993 USFWS BO for the Los Vaqueros Project, the 1993 NMFS BO for the Los Vaqueros Project, and the 2009 CDFW Incidental Take Permit for the Maintenance and Operation of the Los Vaqueros Project and Alternative Intake Project would be eliminated in the proposed action alternatives for the Phase 2 expansion, and instead CCWD's Los Vaqueros Reservoir filling operations would be constrained by the Old and Middle River flow restrictions for the benefit of listed species. CCWD and Reclamation would work with the fisheries agencies to modify the permits for operations at CCWD's intakes accordingly.

Use of Freeport Intake

Operational rules for the use of the Freeport Intake and the EBMUD-CCWD Intertie have been revised from what was used in the 2010 Final EIS/EIR studies. CCWD, Local Agency Partners, and the Refuge Water Supply Program might (subject to obtaining the appropriate water rights modifications and other permits, agreements, and approvals, and the availability of water) receive water diverted from the Freeport Intake through the EBMUD-CCWD Intertie when EBMUD determines that the EBMUD system operations can accommodate such diversions. This water could be delivered directly to Local Agency Partners or the Refuge Water Supply Program, stored in Los Vaqueros Reservoir for later use, or delivered to CCWD in exchange for a reassignment of water previously stored in Los Vaqueros Reservoir from CCWD storage to partner storage. This use would be in addition to the Freeport Intake operations previously included in the 2010 Final EIS/EIR, in which CCWD was the only partner to receive water through the EBMUD-CCWD Intertie from the Freeport Intake, with diversion of up to 3.2 TAF per year of CCWD's CVP contract water as specified under the 2004 Settlement and General Release Agreement between CCWD and the Freeport Regional Water Authority, EBMUD, and the Sacramento County Water Agency (CCWD et al. 2004) and covered in the 2004 Freeport Regional Water Project Final EIR/EIS (Reclamation and FRWA 2004).

Wheeling of Level 2 Refuge Supplies

The option to wheel a portion of Refuge Level 2 water deliveries through CCWD facilities that would otherwise be exported at the Jones Pumping Plant or Banks Pumping Plant has been

added. This operation does not increase refuge water supply deliveries; rather, it creates capacity at the south Delta export facilities for other SOD CVP contractors to use. The wheeling of Level 2 water is not included in Alternative 2A.

Delivery of Increased Incremental Level 4 Water Supplies to Refuges

The project objective of enhancing environmental water supply would be met by making deliveries via the Refuge Water Supply Program to meet Incremental Level 4 Refuge water needs, which is considered to be a Refuge water supply benefit in this analysis. The Refuges would receive water delivered through the Transfer-Bethany Pipeline to the California Aqueduct and then to San Luis Reservoir, with limitations as described below. The delivered water would be either direct diversions or rediversions from the Delta, or releases from Los Vaqueros Reservoir storage. The water would be Delta Surplus Water or water otherwise made available from CCWD or a Local Agency Partner. The Phase 2 Expansion would not change the manner in which water is conveyed by the Refuge Water Supply Program to the various Refuges, which is described next.

The Refuge Water Supply Program conveys water from San Luis Reservoir or directly from Jones Pumping Plant, bypassing San Luis Reservoir, to most of the Refuges via the Delta-Mendota Canal. Jones Pumping Plant and the Delta-Mendota Canal are operated by SLDMWA; the operations and maintenance agreement between Reclamation and SLDMWA identifies water deliveries to Refuges. The majority of Refuges receive water deliveries either diverted directly from the Delta-Mendota Canal or taken from the Mendota Pool through conveyance agreements between Reclamation and three local water and irrigation districts: Central California Irrigation District, GWD, and Henry Miller Reclamation District. East Bear Creek National Wildlife Refuge might receive water via the Mendota Pool and the Eastside Bypass in the near future. Water is delivered to the boundaries of Kern National Wildlife Refuge from San Luis Reservoir through the San Luis Canal and then through the California Aqueduct, utilizing conveyance agreements between Reclamation and DWR, and Buena Vista Water Storage District. Two of the Refuges do not have access to conveyance facilities that would be necessary to receive water from San Luis Reservoir: Pixley NWR and Merced NWR. These two Refuges rely on groundwater and other local sources of supply, including surface water deliveries from a local water and irrigation district.

Local Agency Partner Operations

The objective of enhancing water supply reliability, including drought and emergency supply reliability, would be met by providing water to Local Agency Partners. The Local Agency Partners' demands are based on individual partner water supply needs identified in their 2015 Urban Water Management Plans and other planning studies. The magnitude and timing of the individual partners' demands from the Phase 2 expansion are described in this section below and summarized in Table 4-3. Many of the partners have identified a need for water in drought years; each agency has different criteria for when additional dry year water supply is needed, depending on considerations such as their water supply portfolios, operational and regulatory constraints, and internal policies. For the purpose of simulating the maximum potential operational impacts of the Phase 2 expansion, relatively conservative large planning demands are used in this analysis; strict drought conservation is not assumed in the analysis, even though the Local Agency Partners have all adopted water shortage contingency plans.

The Phase 2 expansion would maximize deliveries to meet the demands specified by the Local Agency Partners using available water supply, subject to operational prioritization rules for each action alternative, physical system limitations, and regulatory restrictions. The delivered water would be either diversions from the Delta or releases from Los Vaqueros Reservoir storage.

In addition to having a portion of Los Vaqueros Reservoir dedicated to general partner storage that would be filled with water upon which all partners could draw, dedicated storage (including reserved drought and/or non-drought emergency storage) for some individual partners would be added (see Table 4-3). The Local Agency Partners that have identified a need for dedicated storage would be allocated a share of the expanded Los Vaqueros Reservoir storage in Final Alternatives 1A, 1B, and 4A, but not in Final Alternative 2A, in which priority is given to environmental water supply. An individual partner's dedicated storage would be reserved for use only by that partner according to its own operational preferences; for many of the Local Agency Partners, the operational preference would be to use their stored water in droughts. Some Local Agency Partners have identified a further need for reserved drought/emergency storage, to be reserved for use only in that partner's defined extreme drought or other non-drought emergency; the reserved emergency storage would be in addition to any dedicated operational storage assigned to that partner.

Table 4-3. Local Agency Partner Phase 2 Expansion Water Supply and Demands

Local Agency Partner	Source of Water Available for Phase 2 Expansion Diversions	Demand from Phase 2 Expansion	Dedicated Storage in Los Vaqueros Reservoir
ACWD	Extra SWP Table A Allocation Third-party water transfers from willing sellers [2]	Up to 24 TAF/year in certain drier years	Yes, including reserved storage of 10 TAF in Final Alternatives 1A & 1B
BAWSCA	None	10 TAF/year in certain drier years	Yes, including reserved storage of 10 TAF in Final Alternatives 1A & 1B and 5 TAF in Final Alternative 4A
BBID	BBID pre-1914 water right [1]	20 TAF/year in critically dry years; additional fall demand in low precipitation months	Yes, including reserved storage of 30 TAF in Final Alternatives 1A & 1B and 5 TAF in Final Alternative 4A.
Brentwood	ECCID Contract	For water quality blending	Yes, including reserved storage of 2 TAF under Existing Conditions and 5 TAF under Future Conditions
EBMUD	Water available under EBMUD's Mokelumne River water right in certain wetter years (available for other partners' use)	Up to 30 TAF/year in certain drier years	None; option to call on stored water based on other partners' use of Mokelumne River water
ECCID	ECCID pre-1914 water right	For water quality blending	Yes, including reserved storage of 3 TAF under Existing Conditions and 6 TAF under Future Conditions
SCVWD	Extra CVP allocation (may be available for other partners' use) Extra SWP Table A Allocation	At least 10 TAF/year in certain drier years and for groundwater recharge	Yes, including reserved storage of at least 20 TAF in Final Alternatives 1A & 1B and 4 TAF in Final Alternative 4A
SFPUC	None	16.7 TAF/year in all years + up to 57 TAF/year in drier years	None
SLDMWA	Third-party water transfers from willing sellers [2] CVP water made available by wheeling Level 2 Refuge supplies	Limited by Phase 2 Expansion operational constraints	None
Zone 7	Extra SWP Table A Allocation Third-party water transfers from willing sellers [2]	Up to 19 TAF/year in drier years	Yes, including preferential storage of up to 5 TAF/year of Delta Surplus Water in all years

Notes:
[1] CEQA evaluation of the addition of storage to these direct diversion pre-1914 rights is not included in the 2017 EIS/EIR for this project.
[2] Third-party transfers are not included in the Phase 2 Expansion analysis, but are discussed in Appendix C of the Supplement to the Final EIS/EIR's sensitivity study.

Key:
ACWD = Alameda County Water District
BAWSCA = Bay Area Water Supply and Conservation Agency
BBID = Byron-Bethany Irrigation District
Brentwood = City of Brentwood
CVP = Central Valley Project
EBMUD = East Bay Municipal Utility District
ECCID = East Contra Costa Irrigation District
SCVWD = Santa Clara Valley Water District
SFPUC = San Francisco Public Utilities Commission
SLDMWA = San Luis & Delta-Mendota Water Authority
SWP = State Water Project
TAF = thousand acre-feet
Zone 7 = Alameda County Flood Control and Water Conservation District, Zone 7

Alternative 1A

Alternative 1A is formulated to maximize deliveries for water supply reliability to the Local Agency Partners, including drought and emergency supply reliability. The operations follow these four priorities:

1) Available water (Delta surplus and Local Agency Partners' water rights and contracts) would first be delivered to meet Local Agency Partner demand, if any.

2) If water and CCWD system capacity were still available, water would then be stored in Los Vaqueros Reservoir for later use by the Local Agency Partners.

3) If additional CCWD system capacity were still available and if CVP north-of-Delta storage conditions allowed withdrawals (high storage conditions only), the next priority would be to wheel CVPIA Level 2 Refuge water through CCWD facilities for delivery to the Refuges. Conducted in coordination with Refuge managers, this operation would release capacity at Jones Pumping Plant that could them be used to move additional water to CVP south-of-Delta contractors. This wheeling operation would not provide additional water supply to the Refuges; rather the released capacity at Jones Pumping Plant could be used to make additional CVP allocations or water transfers.

4) If water and CCWD system capacity were still available after the above three operations, additional deliveries would then be made to help meet Incremental Level 4 Refuge demand.

Alternative 1B

Alternative 1B includes the same facilities as Alternative 1A. Alternative 1B is formulated to maximize potential project deliveries to both Local Agency Partners and Refuges. Alternative 1B balances the priorities of water supply reliability to the Local Agency Partners with environmental water management for the Refuges. The operations follow these four priorities:

1) Available water (Delta surplus and Local Agency Partners' water rights and contracts) would first be delivered to meet Local Agency Partner demand, if any.

2) If water and CCWD system capacity were still available, additional deliveries would then be made to help meet Incremental Level 4 Refuge allocations.

3) If water and CCWD system capacity were still available, water would then be stored in Los Vaqueros Reservoir for later use by the Local Agency Partners or Refuges.

4) If additional CCWD system capacity were still available after the above three operations, the next priority would be to wheel Delta surplus water through CVP facilities to meet Level 2 Refuge demands. Conducted in coordination with the Refuge managers, this operation would release capacity at Jones Pumping Plant to move additional water to CVP south-of-Delta contractors. Wheeling would not provide a new water supply to the Refuges; rather the released capacity at Jones Pumping Plant could be used to make additional CVP allocations or water transfers.

Alternative 2A

Alternative 2A includes the same facilities as Alternatives 1A and 1B. Alternative 2A is formulated to maximize potential project deliveries to the Refuges, prioritizing environmental water management operations. The operations follow these three priorities:

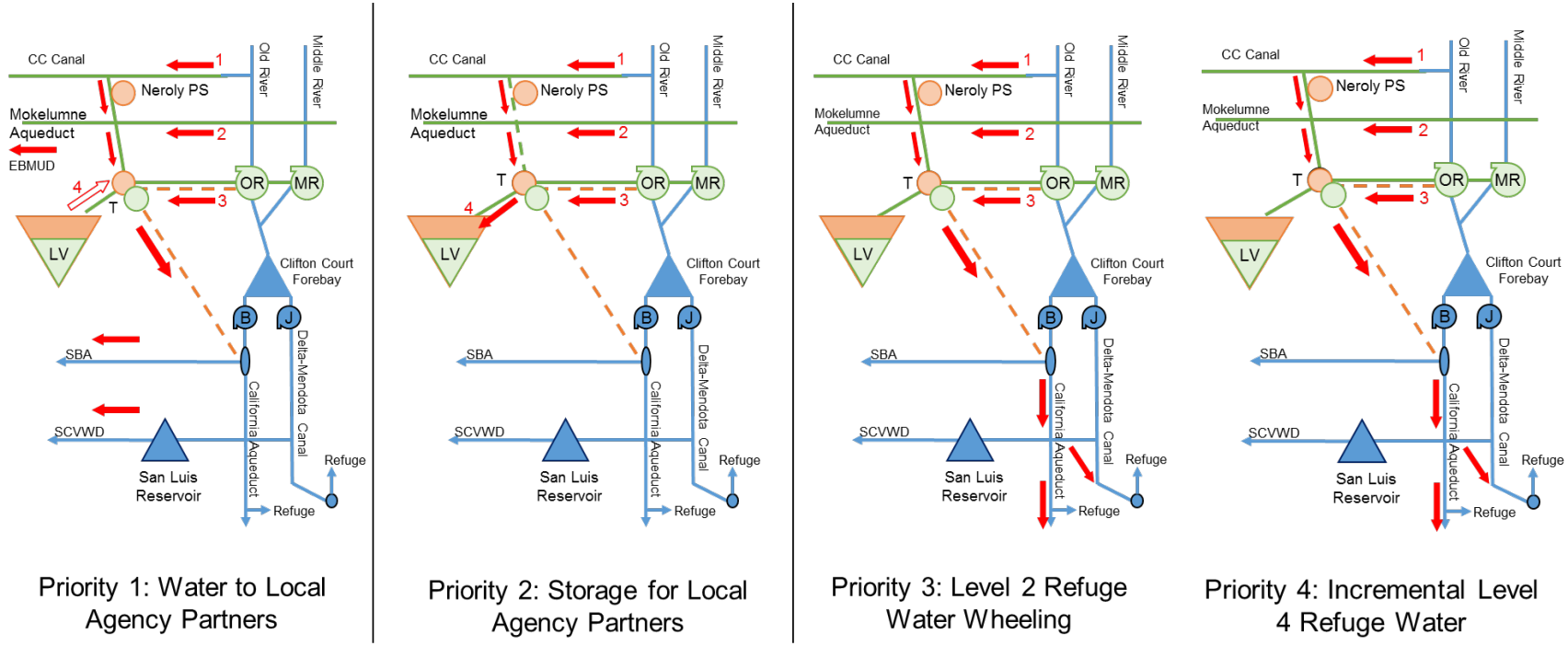
1) Available water (Delta surplus and Local Agency Partners' water rights and contracts) would first be delivered to help meet Incremental Level 4 Refuge allocations.

2) If water and CCWD system capacity were still available, water would then be stored in Los Vaqueros Reservoir for later use by the Refuges.

3) If water and CCWD system capacity were still available after the above two operations, additional deliveries would be made to meet any Local Agency Partner water supply needs.

Alternative 4A

Alternative 4A would not expand the existing 160 TAF Los Vaqueros Reservoir storage capacity or build a new Delta-Transfer Pipeline but would make all of the other major physical improvements identified for Alternatives 1A, 1B, and 2A. Alternative 4A would include an upgrade of the Transfer Facility, a new Transfer-Bethany Pipeline, and facilities to enable filling of Los Vaqueros Reservoir from the Rock Slough Intake. Similar to Final EIS/EIR Alternative 4, Alternative 4A has a Los Vaqueros Reservoir storage capacity of 160 TAF. Alternative 4A uses similar operational priorities as Alternative 1B, with the exception of the wheeling operation, which is not included. Alternative 4A is formulated to maximize potential project deliveries to both the Local Agency Partners and Refuges, but without the benefit of expanded storage in Los Vaqueros Reservoir.



Legend:

Existing Facility

Proposed Phase 2 Expansion Facility

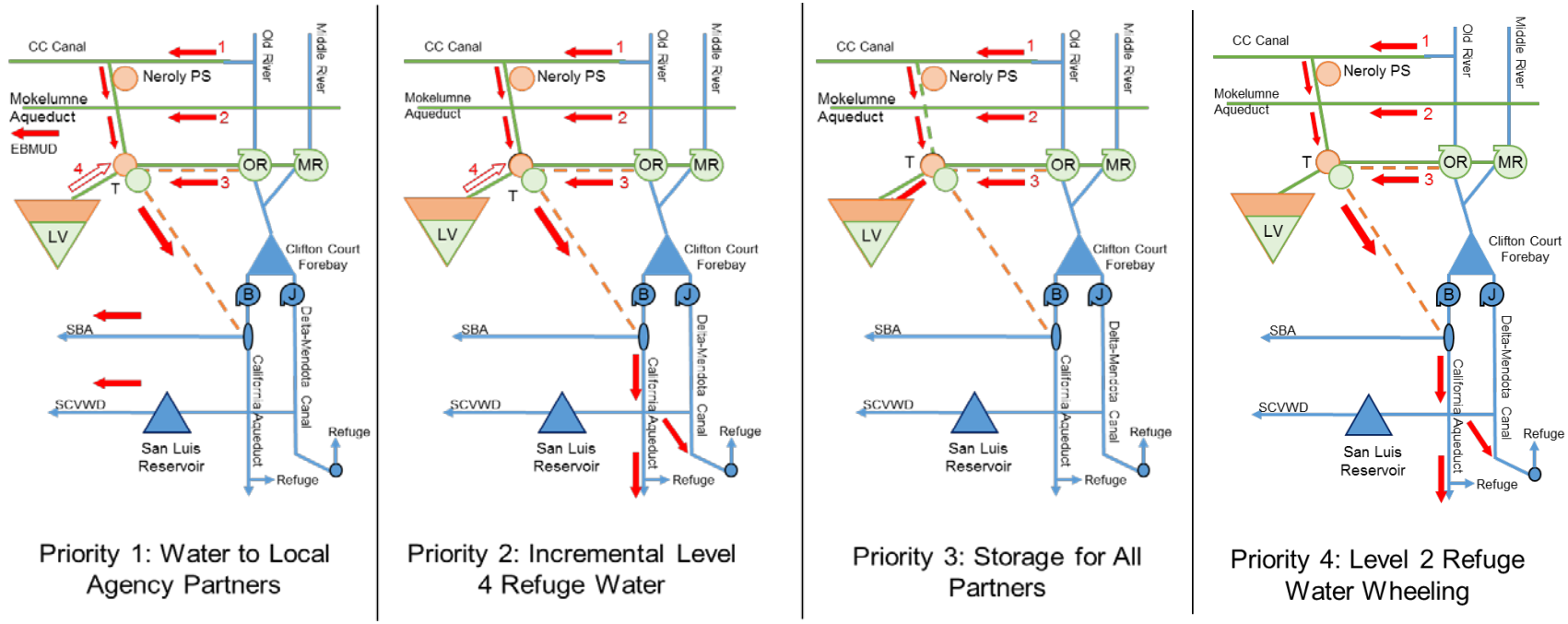
Key:

B = Banks Pumping Plant
CC Canal = Contra Costa Canal
J = Jones Pumping Plant
LV = Los Vaqueros Reservoir
MR = Middle River Intake
OR = Old River Intake
SBA = South Bay Aqueduct
SCVWD = Santa Clara Valley Water District
T = Transfer Facility

Sources of Supply:

1. Rock Slough intake
2. Mokelumne Aqueduct
3 Old River and/or Middle River intakes
4. Los Vaqueros Reservoir releases

Figure 4-4. Schematic of Proposed Operational Priorities for Final Alternative 1A



Legend:

Existing Facility

Proposed Phase 2 Facility

Key:

B = Banks Pumping Plant
CC Canal = Contra Costa Canal
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MR = Middle River Intake
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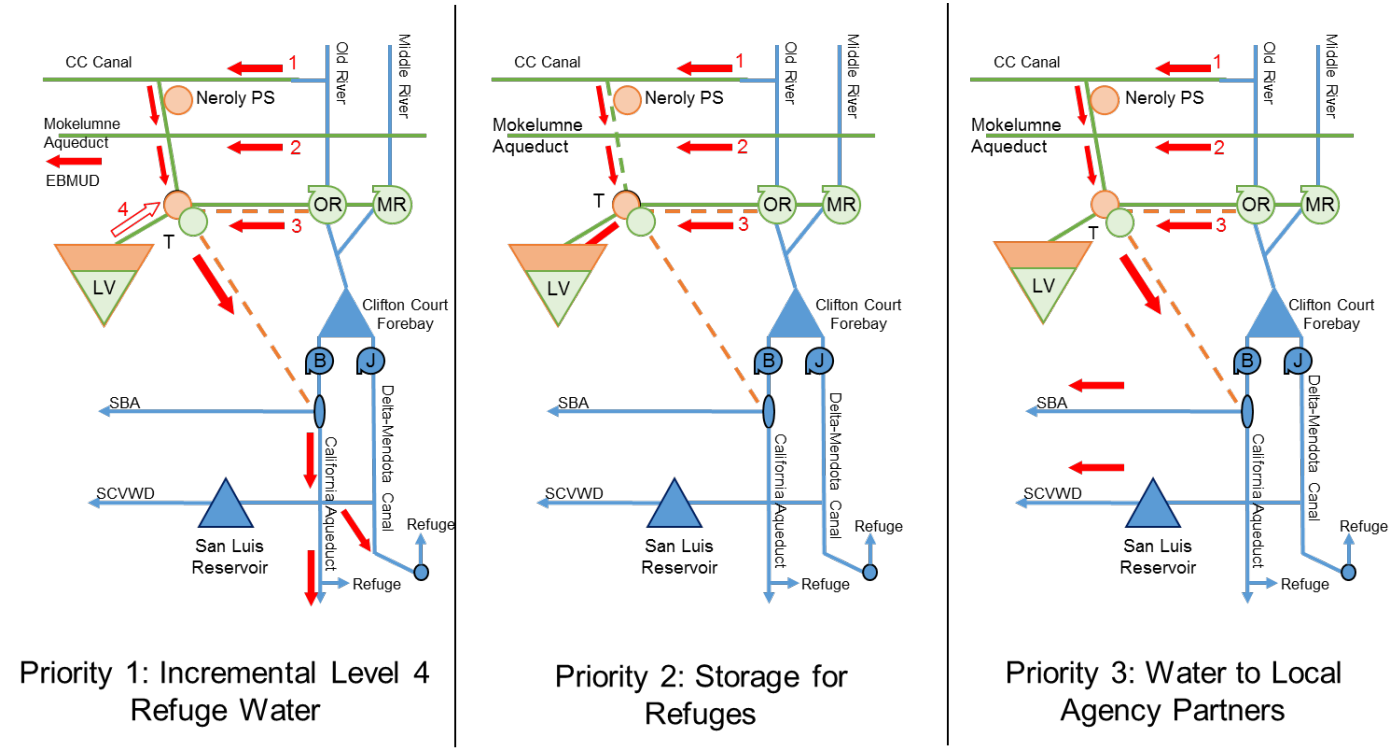
SBA = South Bay Aqueduct
SCVWD = Santa Clara Valley Water District
T = Transfer Facility

Sources of Supply:

1. Rock Slough intake
2. Mokelumne Aqueduct
3 Old River and/or Middle River intakes
4. Los Vaqueros Reservoir releases.

Figure 4-5. Schematic of Proposed Operational Priorities for Final Alternative 1B and 4A



Legend:

Existing Facility

Proposed Phase 2 Facility

Key:

B = Banks Pumping Plant
CC Canal = Contra Costa Canal
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SCVWD = Santa Clara Valley Water District
T = Transfer Facility

Sources of Supply:

1. Rock Slough intake
2. Mokelumne Aqueduct
3 Old River and/or Middle River intakes
4. Los Vaqueros Reservoir releases.

Figure 4-6. Schematic of Proposed Operational Priorities for Final Alternative 2A

Consistency of Final Alternatives with Other Programs

The final alternatives in this Feasibility Report were evaluated on their consistency with the CVPIA, the overall goals and objectives of the CALFED Programmatic ROD, and relevant climate change policy.

Central Valley Project Improvement Act

As described in Chapter 1, the CVPIA is a Federal statute passed in 1992 with a focus on protecting, restoring, and enhancing fish, wildlife, and associated habitats in the Central Valley and other areas of California, including those habitats impacted by construction and operation of the CVP. Providing water supplies to Refuges is an objective of the Investigation, consistent with the CVPIA. The increased delivery of water to Refuges could contribute to meeting Level 4 delivery targets established under the CVPIA. Consistent with the P&G and Reclamation policy, these increases in environmental water deliveries under final alternatives are considered environmental improvements because they contribute to Reclamation meeting its obligation to provide Level 4 optimal water deliveries established under the CVPIA, which have been unmet historically. Chapter 5 includes a summary of the contributions of the final alternatives to providing water supplies to Refuges.

Since the CVPIA was enacted, 1.2 million acre-feet of CVP yield have been dedicated and managed annually to implement the fish, wildlife, and habitat mitigation and restoration purposes and measures authorized by the CVPIA. Final Alternatives 1A, 1B, and 4A would increase water supply reliability to Bay Area CVP M&I contractors through increasing dry and critical year water supplies above and beyond the No Action Alternative. This action could contribute to the replacement of supplies redirected to other purposes under the CVPIA. Chapter 5 includes a summary of the contributions of the final alternatives to increasing water supply reliability to Bay Area CVP M&I contractors.

CALFED

As described in Chapter 1, CALFED was established as a coordinated Federal and State of California program following the Bay-Delta Accord to address water quality, ecosystem quality, water supply reliability, and Delta levee system integrity. CALFED provides a programmatic framework to develop and implement a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta system. As described previously, enlarging Los Vaqueros Reservoir was included in the CALFED Preferred Program Alternative.

Expanding water storage capacity is critical to the successful implementation of all aspects of CALFED. Not only is additional storage needed to meet the needs of a growing population, but if strategically located, such storage will provide much needed flexibility in the system to improve water quality and support fish restoration efforts. The final alternatives could contribute to the CALFED Program Goals in a variety of ways, including increasing water supply reliability (particularly in dry and critical years) and providing emergency supplies in the event of a Delta supply disruption; contributing to improved operational flexibility to support management of Delta water quality; and providing water supplies for environmental purposes (Refuges).

Department of Interior Climate Change Policy

Secretarial Order No. 3289 (as amended, Interior 2010) establishes an Interior-wide approach for applying scientific tools to increase understanding of climate change and its impacts to water and other resources the Department of the Interior manages. This Secretarial Order requires that each bureau and office of the Interior must consider and analyze possible climate change impacts when undertaking long-range planning exercises. This Secretarial Order, and related Interior and Reclamation guidance, reports, and activities, are described in Appendix A – Plan Formulation.

As described in Appendix F – Climate Change, climate change in the watersheds of the Central Valley is expected to result in a shift from snow to rain in winter, leading to reduced snowpack, earlier snowmelt, and reduced river flows in the summer. This would result in changes to the seasonal timing of flows, reservoir storage levels, flood management, recreation, and hydropower generation. Projected increases in temperatures and changes in timing and magnitude of stream runoff will have important implications for California's water supply and are also expected to affect aquatic species due to changes in river flows and water temperatures. Climate change is also expected to cause sea level rise, resulting in increases in Delta water salinity. This increasing salinity will influence the suitability of Delta water for agricultural, urban, and environmental uses, likely having substantial impacts on water management throughout the Central Valley and other regions of California.

- Increasing storage in Los Vaqueros Reservoir would provide improved operational flexibility and increased water supply reliability to meet CVP and other water demands. More water could be diverted to storage during wet years (when available), to offset reduced water availability in dry years due to climate change.

- Coordinating the operation of multiple Delta intakes as part of an expansion project would provide additional water management flexibility, allowing more choices in the timing and location of diversions depending on changing salinity and habitat conditions in the Delta.

- Constructing the Transfer-Bethany Pipeline would allow the Los Vaqueros Project to extend the above benefits to additional Bay Area water suppliers and to Refuges.

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