Appendix 4J

Proposed Project and Alternative 1 Comparison

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4J.1 Introduction

This document summarizes key findings from a series of sensitivity analyses of incremental changes between the Baseline Conditions and Proposed Project and Alternative 1 under historical, climate change, and cumulative conditions. Assumptions related to the modeled representation of the Baseline Conditions and Proposed Project are described in additional detail in Appendix 4A. The range of alternatives considered for this EIR, including Alternative 1, are highlighted in Chapter 11. Additionally, CalSim 3 callouts for Alternative 1 and the other alternatives are included in Appendix 4C; callouts are focused on the modeled representation of assumptions that differ from the Proposed Project. Alternative 1 differs from the Proposed Project in two ways:

- **Deployment of the Fallowing Inject:** The Proposed Project includes a flexible injection of the 50 thousand acre-feet (TAF) fallowing inject between March and May in Above Normal, Below Normal, and Dry water years. The distribution of the 50 TAF volume in these months varies based on the water year type. Rather than a flexible deployment, Alternative 1 injects the 50 TAF volume in May of Above Normal, Below Normal, and Dry water years.
- **Clifton Court Forebay Diversion Window:** The Proposed Project expands the Clifton Court Forebay diversion window from December 15 through March 15 to December 1 through March 31. Alternative 1 mirrors the Baseline Conditions for this assumption and does not include this expanded diversion window.

Of the three alternatives to the Proposed Project described in Chapter 11 and Appendix 4C of this EIR, Alternative 1 differs from the Proposed Project in both assumptions described above while Alternatives 2 and 3 only differ from the Proposed Project with respect to the deployment of the fallowing inject and Clifton Court Forebay diversion window, respectively. An investigation of the Proposed Project and Alternative 1 was conducted to better understand the sensitivities between these modeled differences, as well as how these modeled differences under Alternative 1 respond under additional climate and/or operational conditions (e.g., Temporary Urgency Change Petitions).

Additional model runs of Alternative 1 under a range of considerations, including historical, climate change, and cumulative conditions, were performed to assess modeled response across various regulatory and climate conditions. These additional model runs are described in the sections below as well as Appendices 4D through 4I. Further, if the sensitivities between the Proposed Project and Alternative 1 appear negligible under historical, climate change, and cumulative conditions, it is assumed that the Proposed Project will perform similarly to Alternative 1 under the range of conditions presented in Appendices 4D through 4I.

4J.2 Historical Conditions

Operations results from the Baseline Conditions, Proposed Project, and Alternative 1 were analyzed to understand if the incremental changes between the Baseline Conditions and Proposed Project remain similar to those between the Baseline Conditions and Alternative 1. This section summarizes key CalSim 3 results for these scenarios under historical conditions (i.e., from water year 1922 through 2021).

The CalSim 3 model was used to quantify the changes in river flows, delta channel flows, exports, and water deliveries. Figure 4J-1 through Figure 4J-10 show CalSim 3 simulation results for the following scenarios under historical conditions: Baseline Conditions (black lines), Proposed Project (red lines), and Alternative 1 (green lines). The plots presented below are relevant for assessing whether the conclusions in the hydrology, water quality, and aquatic biological resources analyzed for the Proposed Project in the EIR hold under the changes incorporated with Alternative 1.

In general, incremental changes in monthly long-term average flows are similar for the Proposed Project and Alternative 1 for most parameters. Sacramento River at Freeport, Georgiana Slough, and Delta outflow show some minor increases in flow in May under Alternative 1 compared to the Proposed Project due to the deployment of the entire 50 TAF fallowing inject during that month (rather than the flexible deployment between March and May in the Proposed Project). However, all other parameters (Yolo Bypass, Delta Cross Channel, QWEST, Combined Old and Middle River, Delta exports, and X2) show nearly identical long-term average monthly trends for both the Proposed Project and Alternative 1. Annual trends for Delta exports also show little difference between the Proposed Project and Alternative 1.

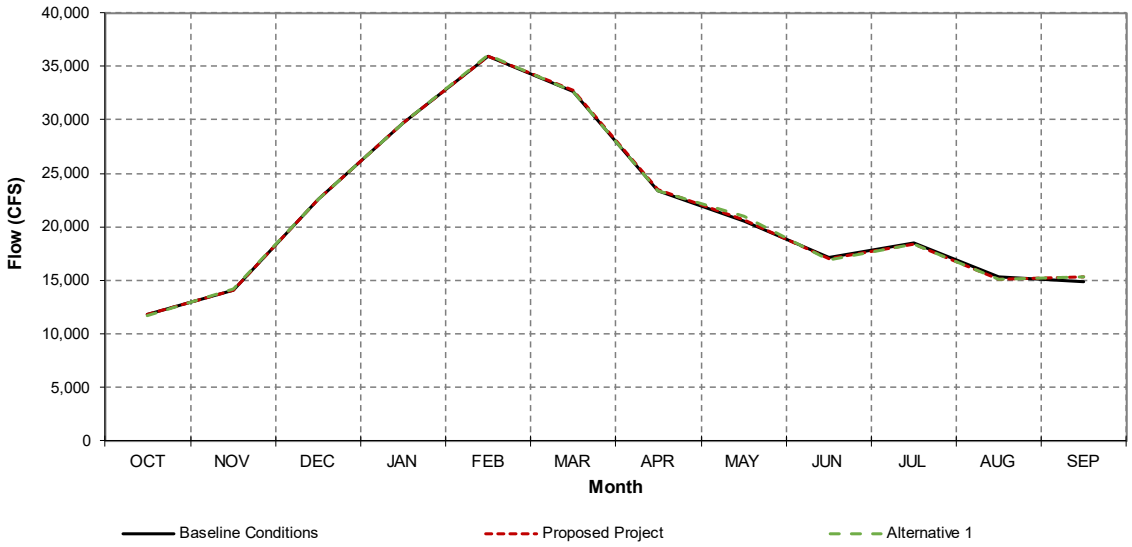

Figure 4J-1. Sacramento River at Freeport Monthly Long-term Average Flow for the Baseline Conditions, Proposed Project, and Alternative 1

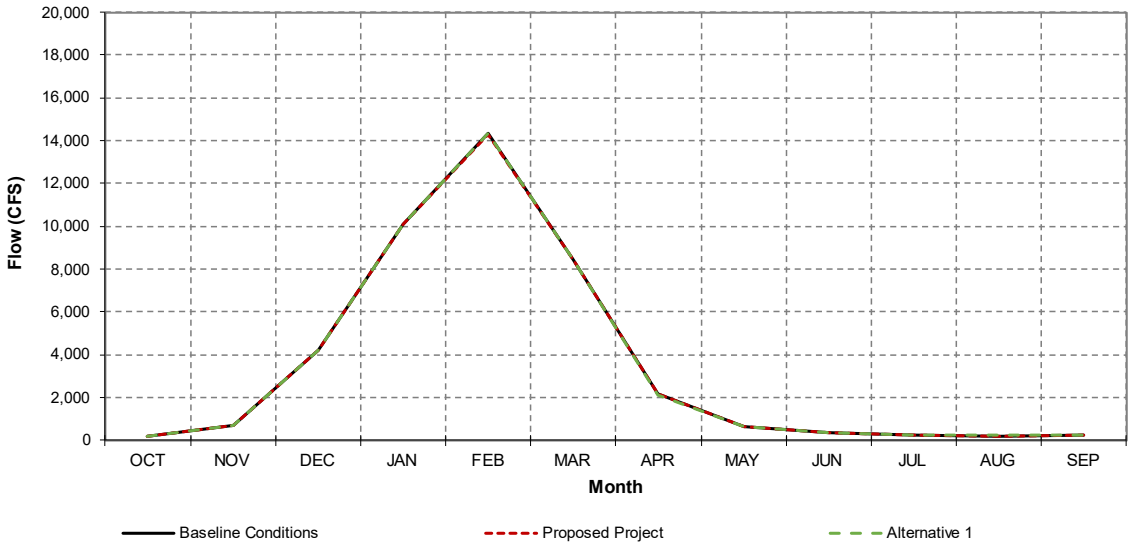

Figure 4J-2. Monthly Long-term Average Yolo Bypass Flow for the Baseline Conditions, Proposed Project, and Alternative 1

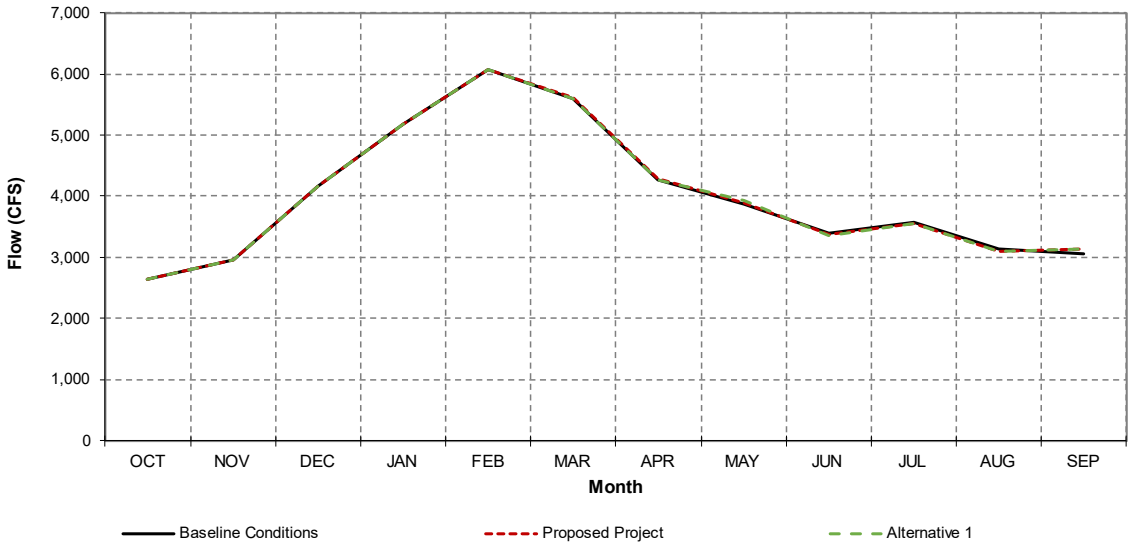

Figure 4J-3. Monthly Long-term Average Georgiana Slough Flow for the Baseline Conditions, Proposed Project, and Alternative 1

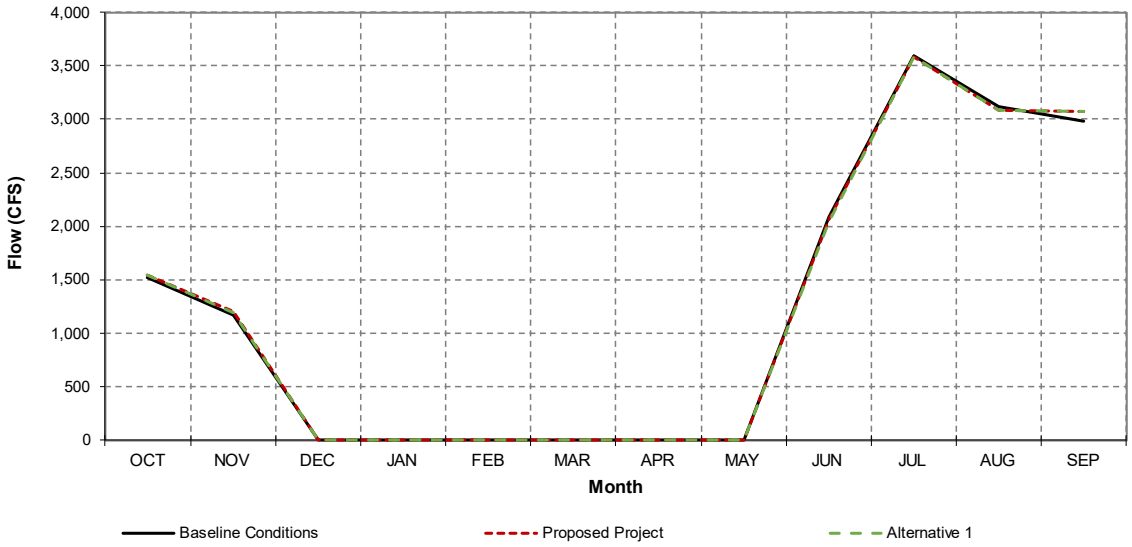

Figure 4J-4. Monthly Long-term Average Delta Cross Channel Flow for the Baseline Conditions, Proposed Project, and Alternative 1

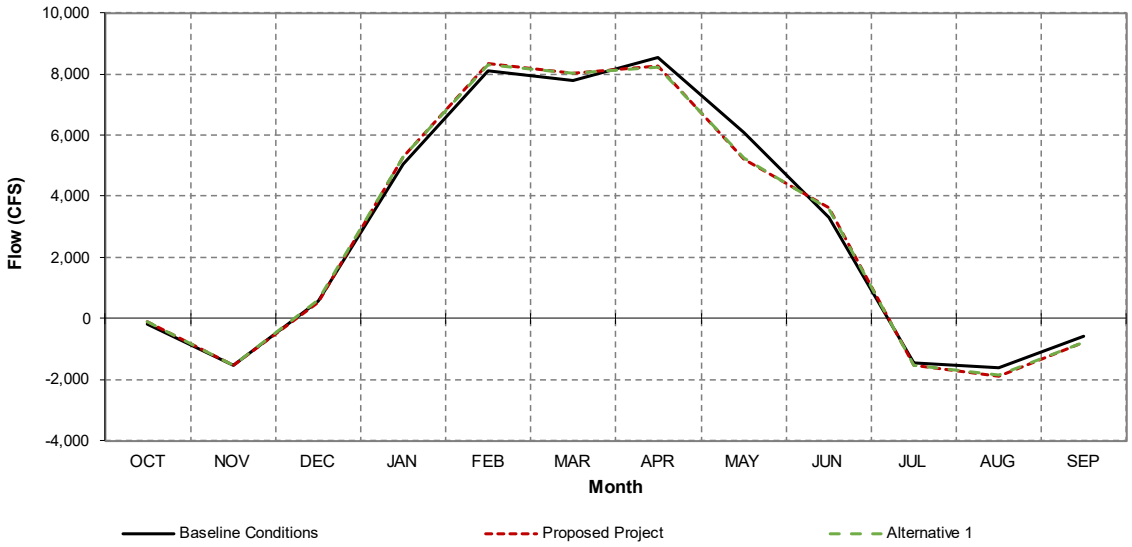

Figure 4J-5. Monthly Long-term Average QWEST Flow for the Baseline Conditions, Proposed Project, and Alternative 1

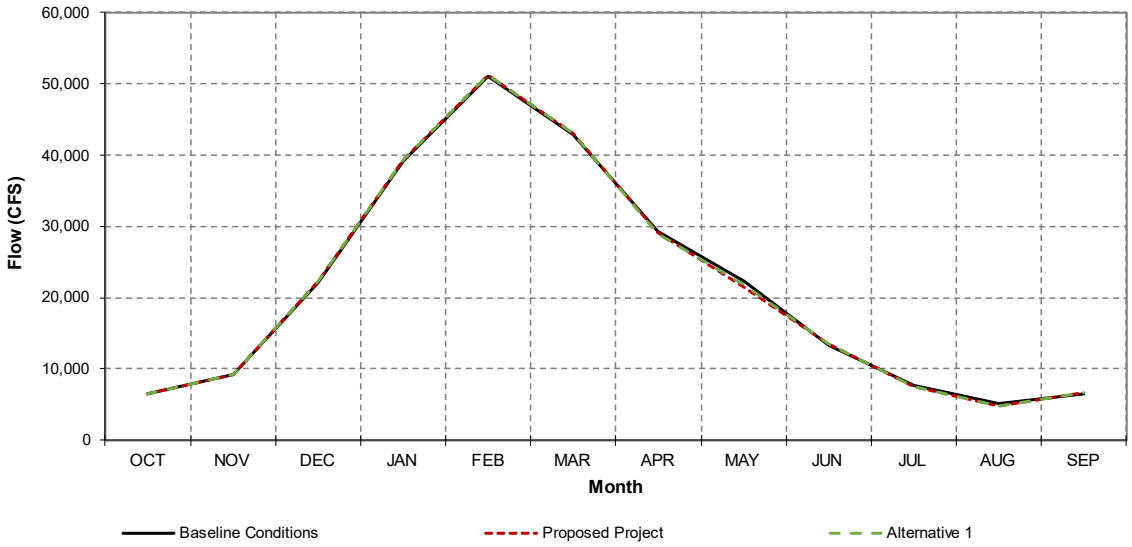

Figure 4J-6. Monthly Long-term Average Delta Outflow for the Baseline Conditions, Proposed Project, and Alternative 1

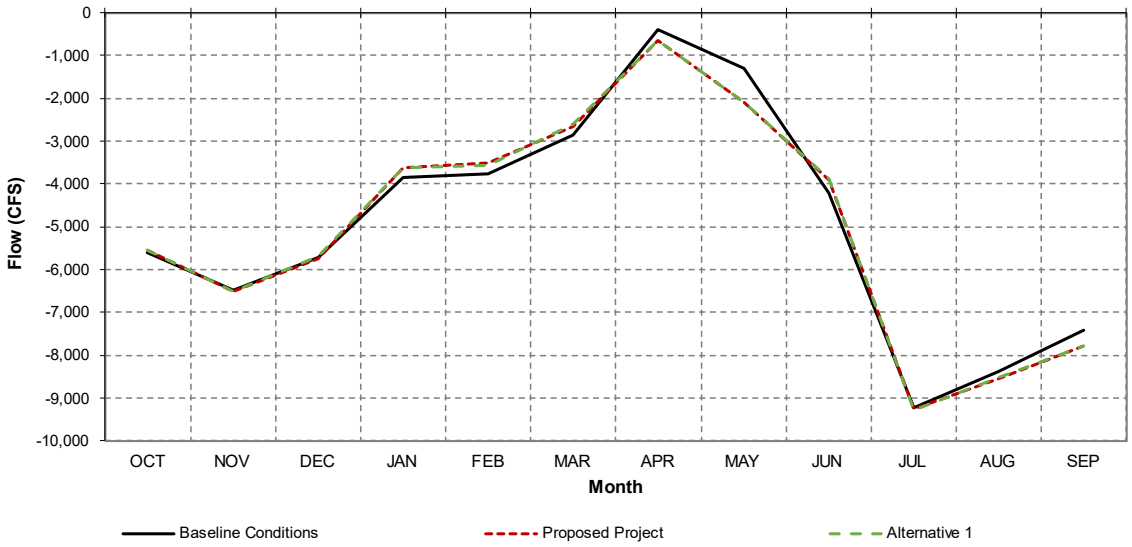

Figure 4J-7. Monthly Long-term Average Combined Old and Middle River Flow for the Baseline Conditions, Proposed Project, and Alternative 1

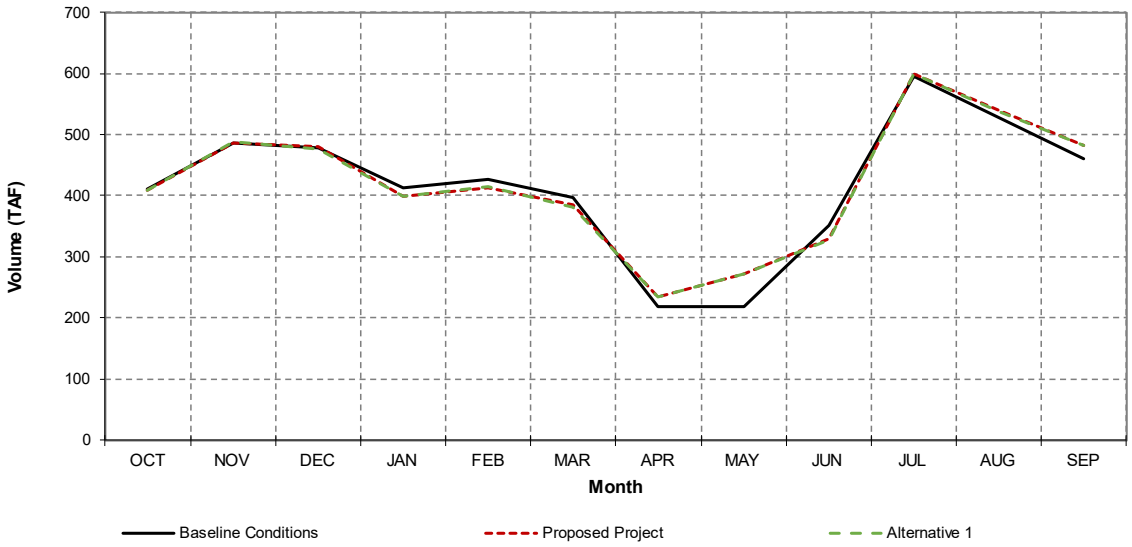

Figure 4J-8. Monthly Long-term Average Delta Exports for the Baseline Conditions, Proposed Project, and Alternative 1

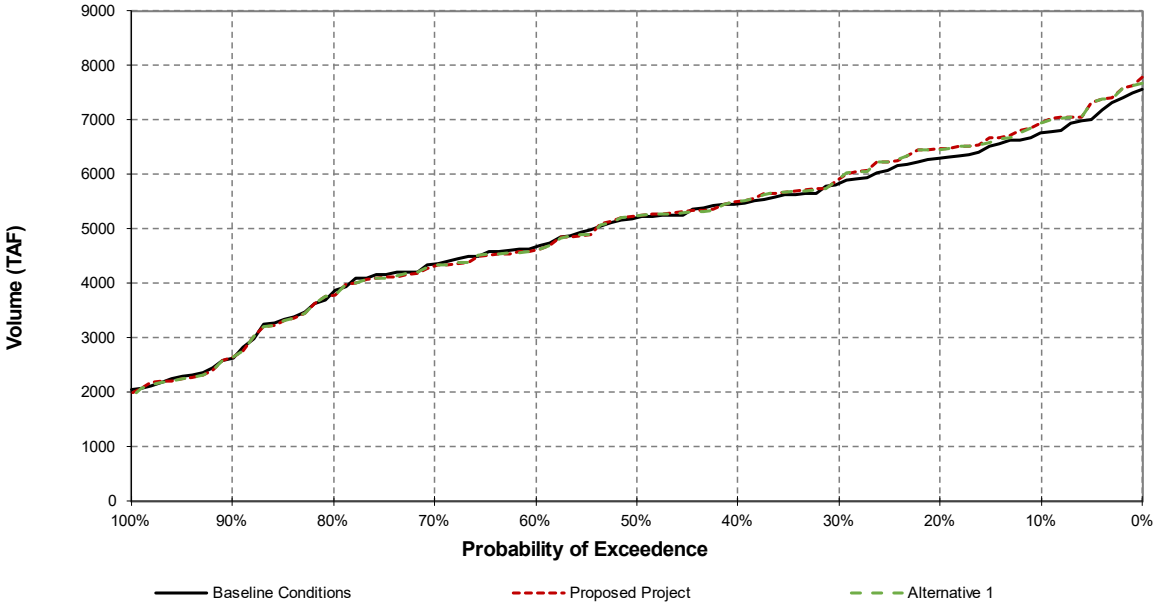

Figure 4J-9. Annual Delta Exports for the Baseline Conditions, Proposed Project, and Alternative 1

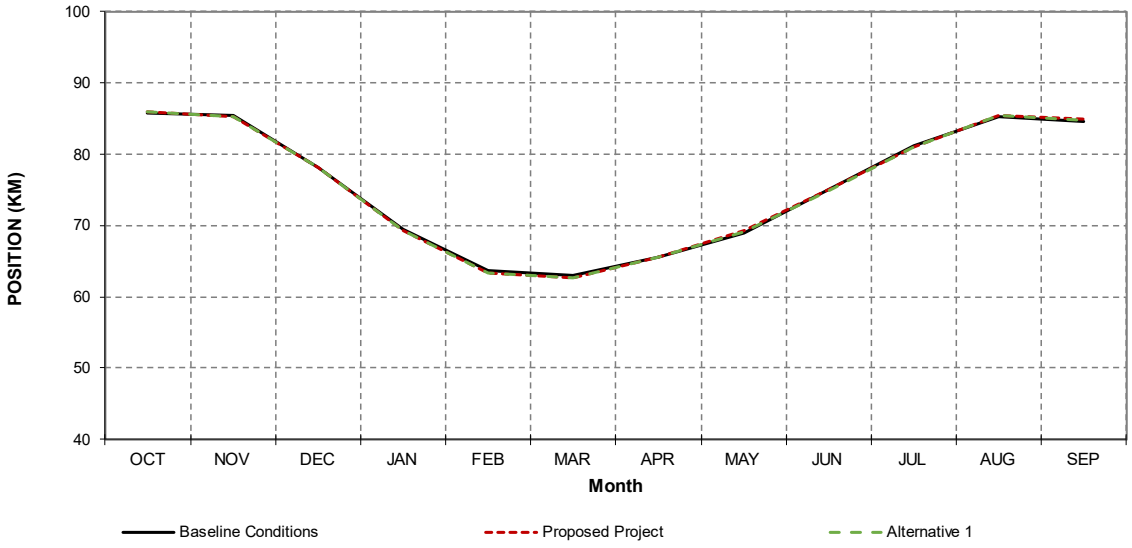

Figure 4J-10. Monthly Long-term Average X2 Position for the Baseline Conditions, Proposed Project, and Alternative 1

4J.3 Climate Change

For this sensitivity analysis, the Baseline Conditions, Proposed Project, and Alternative 1 were modeled using a 30-year climate period centered around year 2022 with 15 cm of sea level rise. Additional information related to the selected climate and sea level rise scenarios and the necessary changes to CalSim 3 inputs to reflect these effects is documented in Appendix 4D. Operations results from these simulations were analyzed to understand if the incremental changes between the Baseline Conditions and Proposed Project remain similar to those between the Baseline Conditions and Alternative 1 under these conditions. This section summarizes key CalSim 3 results for the Baseline Conditions, Proposed Project, and Alternative 1 under the 2022 climate conditions and 15 cm of sea level rise.

The CalSim 3 model was used to quantify the changes in river flows, delta channel flows, exports, and water deliveries. Figure 4J-11 through Figure 4J-20 show CalSim 3 simulation results for the following scenarios under 2022 climate change conditions and 15 cm of sea level rise: Baseline Conditions (blue lines), Proposed Project (purple lines), and Alternative 1 (orange lines). The plots presented below are relevant for assessing whether the conclusions in the hydrology, water quality, and aquatic biological resources analyzed for the Proposed Project under climate change and sea level rise in the EIR hold under the changes incorporated with Alternative 1.

Similar to the historical conditions described above, incremental changes in monthly long-term average flows are largely identical under 2022 climate conditions and 15 cm of sea level rise for the Proposed Project and Alternative 1 for most parameters. While climate change has the potential to modify the magnitudes of flows under these scenarios, incremental changes ultimately remain similar under these conditions for most parameters. Trends for the Sacramento River at Freeport, Georgiana Slough, and Delta outflow show some minor increases in flow in May under Alternative 1 compared to the Proposed Project due to the deployment of the entire 50 TAF fallowing inject during that month (rather than the flexible deployment between March and May in the Proposed Project), but other parameters (Yolo Bypass, Delta Cross Channel, QWEST, Combined Old and Middle River, Delta exports, and X2) show nearly identical long-term average monthly trends for both the Proposed Project and Alternative 1. Annual trends for Delta exports also show little difference between the Proposed Project and Alternative 1 under 2022 climate change and 15 cm of sea level rise.

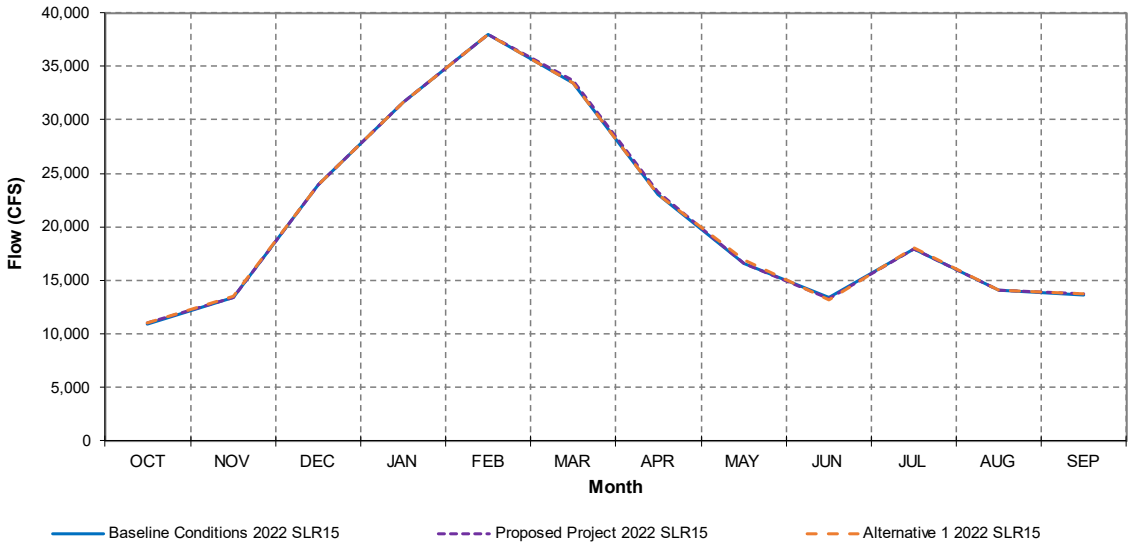

Figure 4J-11. Sacramento River at Freeport Monthly Long-term Average Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

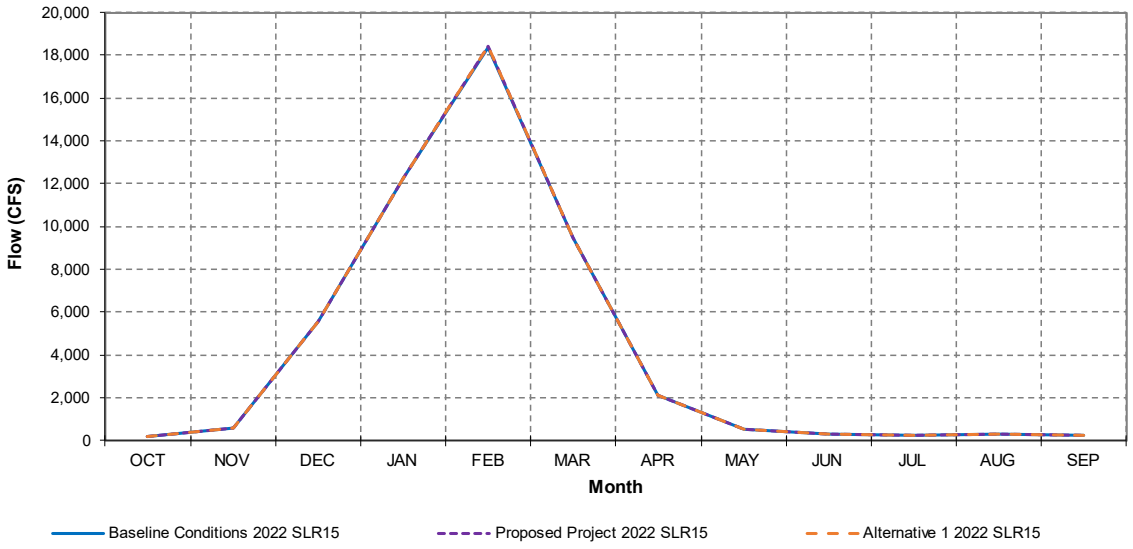

Figure 4J-12. Monthly Long-term Average Yolo Bypass Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

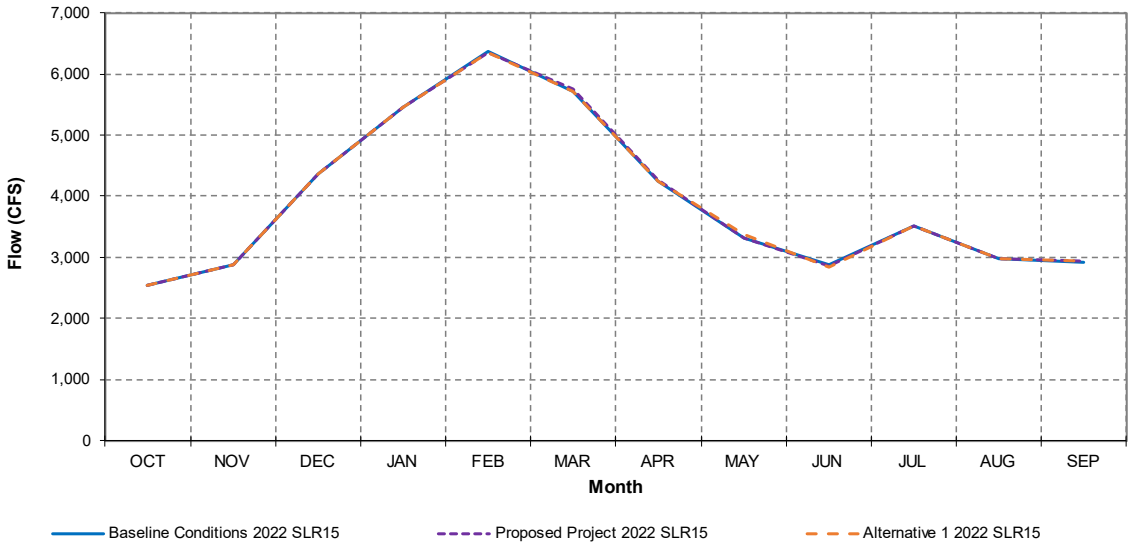

Figure 4J-13. Monthly Long-term Average Georgiana Slough Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

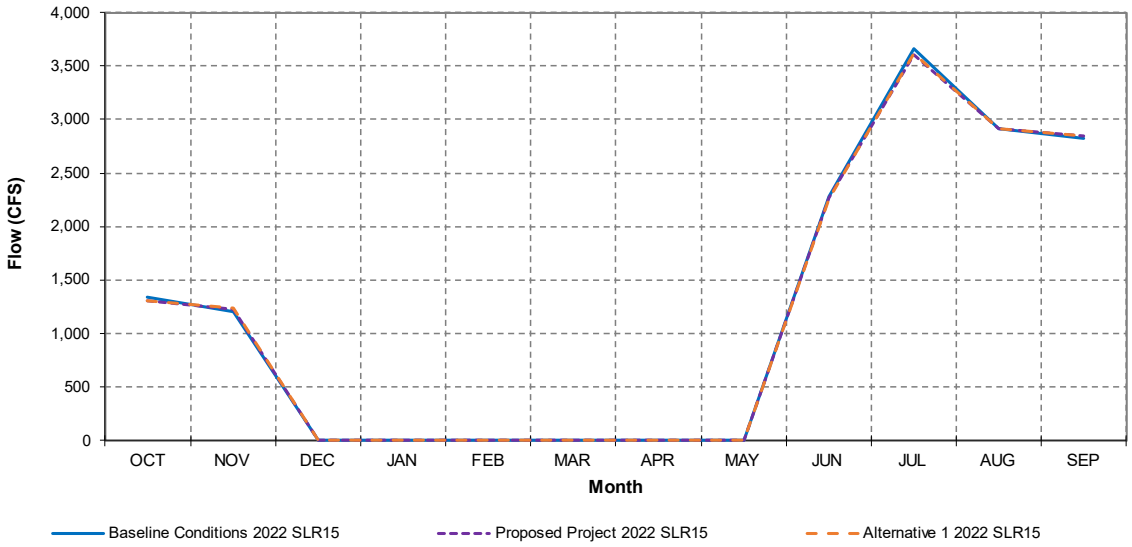

Figure 4J-14. Monthly Long-term Average Delta Cross Channel Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

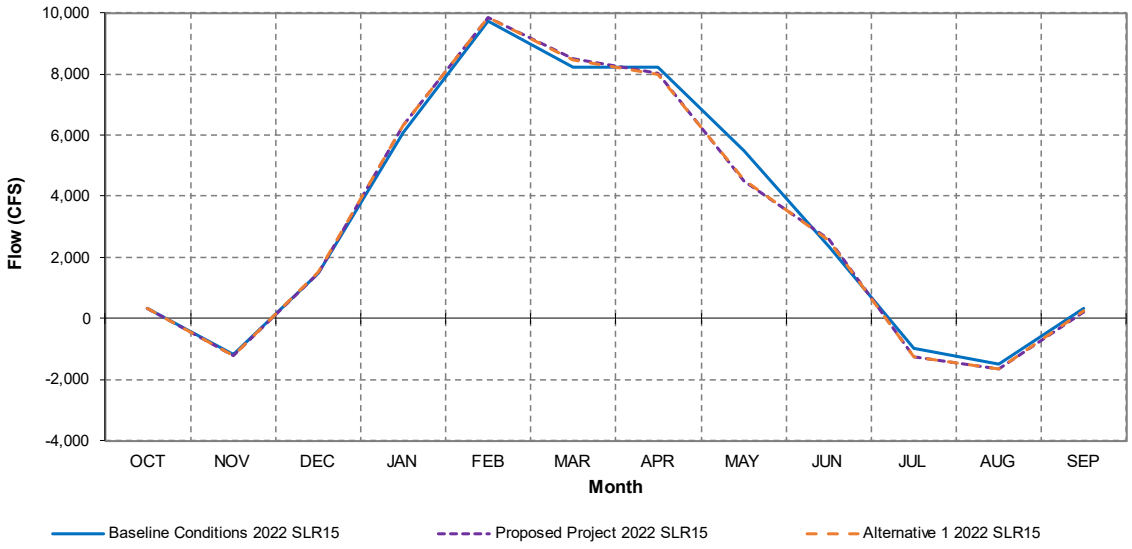

Figure 4J-15. Monthly Long-term Average QWEST Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

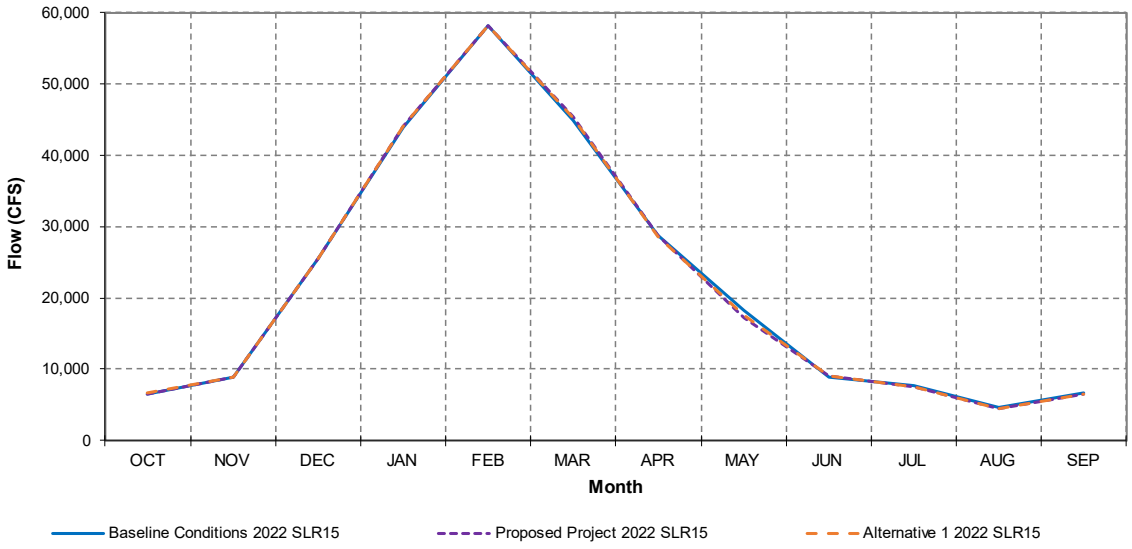

Figure 4J-16. Monthly Long-term Average Delta Outflow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

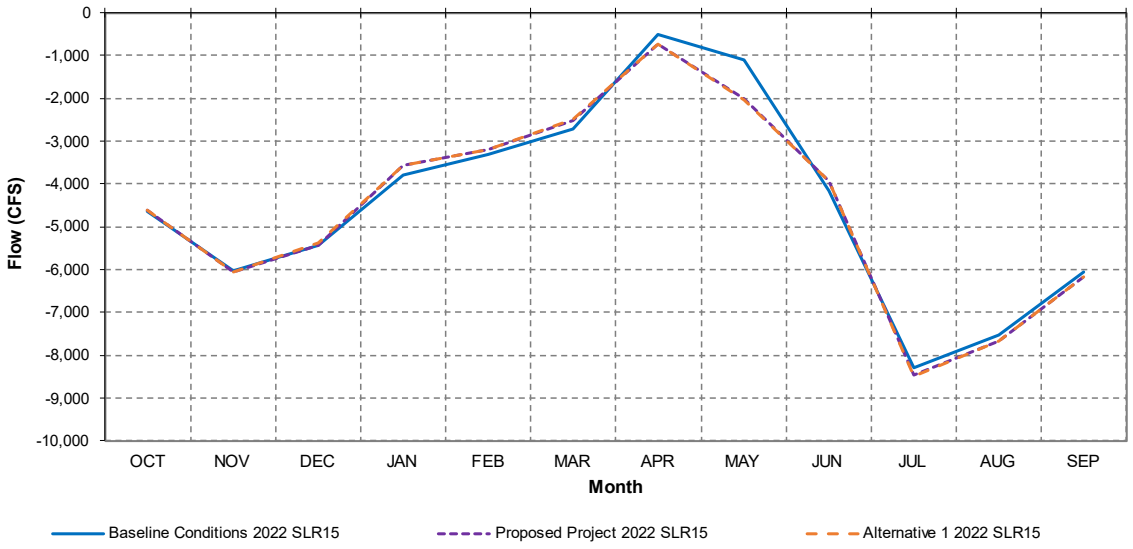

Figure 4J-17. Monthly Long-term Average Combined Old and Middle River Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

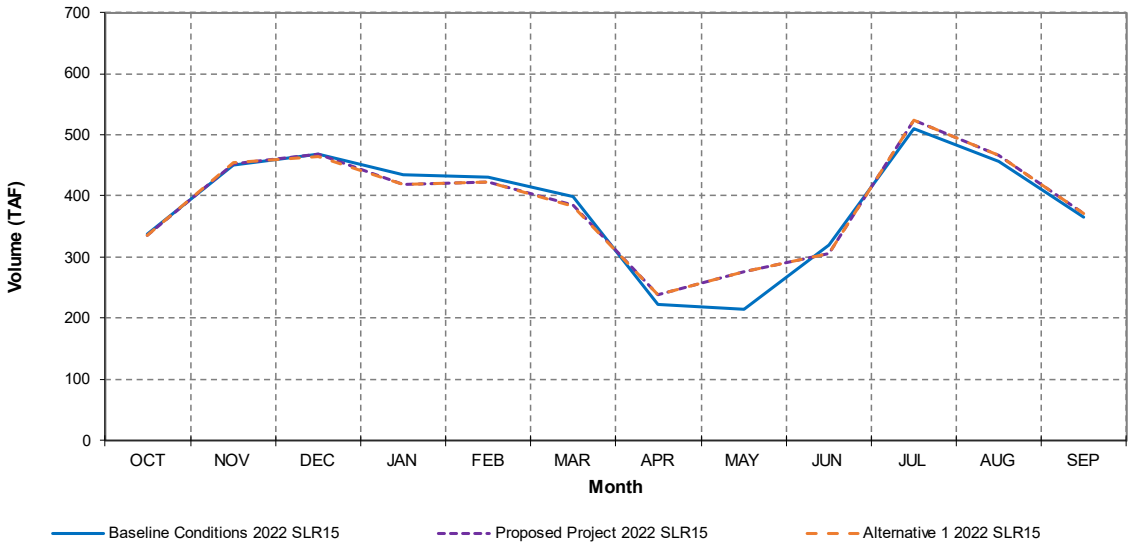

Figure 4J-18. Monthly Long-term Average Delta Exports for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

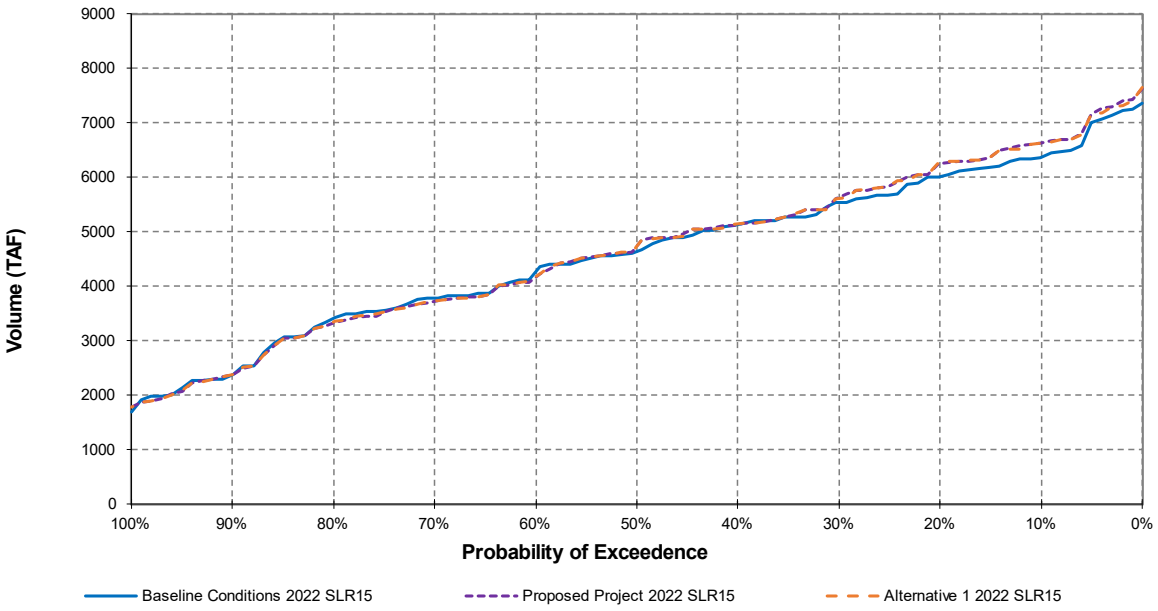

Figure 4J-19. Annual Delta Exports for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

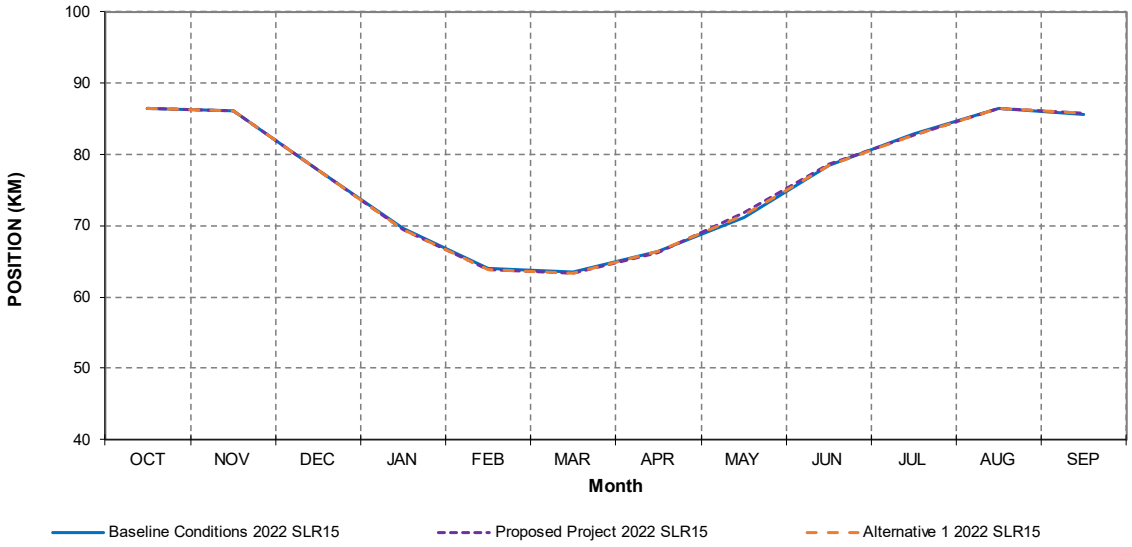

Figure 4J-20. Monthly Long-term Average X2 Position for the Baseline Conditions, Proposed Project, and Alternative 1 under Future Climate Centered around 2022 with 15 cm of Sea Level Rise

4J.4 Cumulative Conditions

For this sensitivity analysis, the Proposed Project and Alternative 1 were modeled with cumulative projects. The Baseline Conditions scenario was also updated to serve as a more appropriate comparison between these cumulative scenarios. Additional information on cumulative projects considered for this EIR are highlighted in Chapter 10. The modeled representation of the updated Baseline Conditions and Proposed Project/Alternative 1 plus cumulative projects is highlighted below in Table 4J-1. Operations results from these simulations were analyzed to understand if the incremental changes between the Baseline Conditions and Proposed Project remain similar to those between the Baseline Conditions and Alternative 1 under cumulative conditions. This section summarizes key CalSim 3 results for the Baseline Conditions, Proposed Project, and Alternative 1 under these conditions.

Table 4J-1. CalSim 3 Callouts for the Baseline Conditions, Baseline Conditions (Updated), Proposed Project, Proposed Project plus Cumulative, and Alternative 1 plus Cumulative

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
GENERAL					
Planning horizon	Year 2020	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Period of simulation	100 years (1922-2021)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
HYDROLOGY					
Inflows/Supplies	Inflows based on Historical Hydrology	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Level of development	2020 level[1]	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
WATER RIGHTS, CVP/SWP CONTRACTS					
Sacramento River Region (excluding American River)					
CVP	Land-use based demands, full build-out of contract amounts	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
SWP (FRSA)	Land-use based demands, limited by contract amounts	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Non-project	Land-use based demands, limited by water rights and SWRCB Decisions for Existing Facilities	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Antioch Water Works	Pre-1914 water right	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Federal refuges	Firm Level 2 water supply needs. Refuge Level 4 (and incremental Level 4) water is not included.	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sacramento River Region - American River					
Water rights	Year 2020, full water rights	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
CVP	Year 2020, full contracts	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
San Joaquin River Region					
Friant Unit	Limited by contract amounts, based on current allocation policy	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Lower Basin	Land-use based demands, based on district level operations and constraints	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Stanislaus River	Land-use based demands, Stepped Release Plan (SRP)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
San Francisco Bay, Central Coast, Tulare Lake and South Coast Regions (CVP/SWP project facilities)					
CVP	Demand based on contract amounts	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
CCWD	195 TAF/yr CVP contract supply, water rights and in-Delta transfers	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
SWP[2]	Demand based on full Table A amounts	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Article 56	Based on 2014-19 initial contractor requests	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Article 21	MWD delivery up to 286.17 TAF/year (January-May) subject to conveyance capacity, KCWA delivery up to 543.69 TAF/year (November-June), and other contractor deliveries up to maximum of 333.45 TAF/year, subject to conveyance capacity. All demands have been scaled up by 20% to not constrain Article 21 demands strictly by historical data.	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
North Bay Aqueduct (NBA)	77 TAF/yr demand under SWP contracts. Up to 2.635 TAF/mon of excess flow (i.e., when Standard Water Right Term 91 is not in effect, UWFE used as surrogate) under Fairfield, Vacaville and Benecia Settlement Agreement. NOD Allocation Settlement Agreement terms for Napa and Solano	Same as Baseline Conditions	Same as Baseline Condition, limited to a maximum 7-day average diversion rate of 100 cfs in January through March of Dry and Critical water years (according to the Sacramento 40-30-30 water year type).	Same as Proposed Project	Same as Proposed Project

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Federal refuges	Firm Level 2 water supply needs. Refuge Level 4 (and incremental Level 4) water is not included.	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
FACILITIES					
Systemwide					
Systemwide	Existing facilities	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sacramento River Region					
Shasta Lake	Existing, 4,552 TAF capacity	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Red Bluff Diversion Dam	Diversion dam gates out all year, Pumping Plant operated to deliver CVP water	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Fremont Weir	Notched Fremont Weir as represented in Yolo Bypass Salmonid Habitat Restoration and Fish Passage EIS/EIR Alternative 1 (preferred alternative)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Colusa Basin	Existing conveyance and storage facilities	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Lower American River	Hodge criteria for diversion at Fairbairn	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Upper American River	PCWA American River Pump Station	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Lower Sacramento River	Freeport Regional Water Project	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
San Joaquin River Region					
Millerton Lake (Friant Dam)	Existing, 524 TAF capacity	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Lower San Joaquin River	City of Stockton Delta Water Supply Project, 30-mgd capacity	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
SWP Banks Pumping Plant (South Delta)	Physical capacity is 10,300 cfs but 6,680 cfs permitted capacity in all months; up to 10,300 cfs during December 15–March 15, depending on Vernalis flow conditions[4]; additional capacity of 500 cfs (up to 7,180 cfs) allowed July–September for reducing impact of export restrictions for ESA or CESA.	Same as Baseline Conditions	Physical capacity is 10,300 cfs but 6,680 cfs permitted capacity in all months; up to 10,300 cfs during **December 1–March 31**, depending on Vernalis flow conditions; additional capacity of 500 cfs (up to 7,180 cfs) allowed July–September for reducing impact of export restrictions for ESA or CESA.	Same as Proposed Project	Same as Baseline Conditions
CVP C.W. "Bill" Jones Pumping Plant (formerly Tracy PP)	Permit capacity is 4,600 cfs in all months (allowed for by the Delta-Mendota Canal–California Aqueduct Intertie)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Upper Delta-Mendota Canal Capacity	Existing plus 400 cfs Delta-Mendota Canal–California Aqueduct Intertie	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
CCWD Intakes	Los Vaqueros existing storage capacity, 160 TAF, existing intakes except for Mallard Slough Intake.	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Head of Old River Barrier (HORB)	Not installed	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
San Francisco Bay Region					
South Bay Aqueduct (SBA)	SBA rehabilitation, 430 cfs capacity from junction with California Aqueduct to Alameda County FC&WSD Zone 7 diversion point	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
South Coast Region					
California Aqueduct East Branch	Existing capacity	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
REGULATORY STANDARDS					
North Coast Region					
Trinity River					
Minimum flow below Lewiston Dam	Trinity EIS Preferred Alternative (369-815 TAF/yr)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Trinity River Fall Augmentation Flows	50 TAF August 1 through September 30 in all but very wet years	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Trinity Reservoir end-of-September minimum storage	Trinity EIS Preferred Alternative (600 TAF as able)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sacramento River Region					
Clear Creek					
Minimum flow below Whiskeytown Dam	Downstream water rights, 1963 USBR Proposal to USFWS and NPS; and 200 cfs October through May or 150 cfs in Critical years and 150 cfs June through September with 10 TAF for channel maintenance in February of BN, AN and Wet years and 10 TAF for Spring pulse flows in June of non-Critical years; in June of Critical years, 3-day pulse of 900 cfs	Clear Creek seasonally variable hydrograph minimum flows (200 cfs annual average; oscillating from 300 cfs in winter to 100 cfs in summer) with 10 TAF for pulse flows except in C years. 5 TAF for pulse flows in C years. Additionally: target 150 cfs in C years; not to exceed 840 cfs (safe outflow works capacity of Whiskeytown)	Same as Baseline Conditions	Same as Baseline Conditions (Updated)	Same as Baseline Conditions (Updated)
Upper Sacramento River					
Shasta Lake end-of-September storage target	1900 TAF in non-critically dry years (not explicitly modeled - achieved through project allocation profiles when hydrologically feasible)	Same as Baseline Conditions	Same as Baseline Conditions	Carryover targets based upon May 1 fill and carryover projection – actions designed to help meet targets may not accomplish full intent. Carryover for Sacramento VA omitted from carryover target calculations	Same as Proposed Project plus Cumulative

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Minimum flow below Keswick Dam	SWRCB WR 90-5, and 2019 BiOps (stabilize fall flows to reduce redd dewatering and rebuild cold water pool; and spring pulse flow up to 150 TAF if projected May 1 storage > 4.1 MAF). • **Fall Flows:** Fall flow target of: ○ 3,250 cfs when end of September (EOS) Shasta storage is less than 2.2 MAF. ○ 4,000 cfs when EOS Shasta storage exceeds 2.2 MAF. ○ 4,500 cfs when EOS Shasta storage exceeds 2.8 MAF. ○ 5,000 cfs when EOS Shasta storage exceeds 3.2 MAF. • **Spring Pulse:** ○ In March of 40-30-30 Wet and Above Normal years releases occur if end-of-February Shasta storage exceeds 3.2 MAF and 3.5 MAF, respectively. ○ In April of 40-30-30 Wet and Above Normal years releases occur if end of March Shasta storage exceeds 3.8 MAF and 4.1 MAF, respectively.	Same as Baseline Conditions; except for Shasta storage thresholds for Fall Flows and Spring Pulse releases. • **Fall Flows:** Fall flow target of: ○ 3,250 cfs when end of September (EOS) Shasta storage is less than 2.4 MAF. ○ 4,000 cfs when EOS Shasta storage exceeds 2.4 MAF. ○ 4,500 cfs when EOS Shasta storage exceeds 2.8 MAF. ○ 5,000 cfs when EOS Shasta storage exceeds 3.2 MAF. • **Spring Pulse:** ○ In March of 40-30-30 Wet and Above Normal years releases occur if end-of-February Shasta storage exceeds 3.7 MAF. ○ In April of 40-30-30 Wet and Above Normal years releases occur if end of March Shasta storage exceeds 4.1 MAF, respectively.	Same as Baseline Conditions	Same as Baseline Conditions (Updated)	Same as Baseline Conditions (Updated)
Feather River					
Minimum flow below Thermalito Diversion Dam	2006 Settlement Agreement (700 Apr 1–Sep 8, 800 cfs Sep 9–Mar 31)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Minimum flow below Thermalito Afterbay outlet	1983 DWR, DFG Agreement (750-1,700 cfs)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Land fallowing	No action	Same as Baseline Conditions	Assume land fallowing occurs in Above Normal, Below Normal and Dry water years. This results in a 50 TAF total increase (dedicated to Delta outflow) to Delta inflow between March and May depending on water year type as follows: • **Above Normal:** ○ March: 25 TAF ○ April: 12.5 TAF ○ May: 12.5 TAF • **Below Normal:** ○ March: 12.5 TAF ○ April: 25 TAF ○ May: 12.5 TAF • **Dry:** ○ March: 16.66 TAF ○ April: 16.67 TAF ○ May: 16.67 TAF The 50 TAF volume is assumed to originate from water purchases made possible through the collection of diversion fees from SWP contractors. For modeling purposes, the 50 TAF is introduced at Freeport.	Same as Proposed Project	Assume land fallowing occurs in Above Normal, Below Normal and Dry water years. This results in a 50 TAF increase (dedicated to Delta outflow) to Delta inflow in May. The 50 TAF volume is assumed to originate from water purchases made possible through the collection of diversion fees from SWP contractors. For modeling purposes, the 50 TAF is introduced at Freeport.

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Yuba River					
Minimum flow below Englebright (Smartville gage) and below Daguerre Point Dam (Marysville gage)	State Water Board RD-1644 Operations/WR 2008-0014 (Lower Yuba River Accord)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
American River					
Minimum flow below Nimbus Dam	American River Flow Management Standard, per 2017 Water Forum Agreement with a planning minimum end of December storage target of 275 TAF	American River Flow Management Standard, per 2017 Water Forum Agreement using a 90% forecast, no reduction Apr-Jun for March pulse, with a planning minimum end of December storage target modeled as 275 TAF	Same as Baseline Conditions	Same as Baseline Conditions (Updated)	Same as Baseline Conditions (Updated)
Minimum Flow at H Street Bridge	SWRCB D-893	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Lower Sacramento River					
Minimum flow near Rio Vista	SWRCB D-1641	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
San Joaquin River Region					
Mokelumne River					
Minimum flow below Camanche Dam	FERC 2916-029, 1996 (Joint Settlement Agreement) (100-325 cfs)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Minimum flow below Woodbridge Diversion Dam	FERC 2916-029, 1996 (Joint Settlement Agreement) (25-300 cfs)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Stanislaus River					
Minimum flow below Goodwin Dam	Flows per New Melones SRP	Same as Baseline Conditions	Same as Baseline Conditions	Flows per New Melones SRP with modified Winter Instability Flows	Same as Proposed Project plus Cumulative
Minimum dissolved oxygen	SWRCB D-1422	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Merced River					
Minimum flow below Crocker-Huffman Diversion Dam	Cowell Agreement	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Minimum flow at Shaffer Bridge	FERC 2179 (25-100 cfs), with 12.5 TAF in October based on 2002 Merced ID and CDFW Memorandum of Understanding	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Tuolumne River					
Minimum flow at Lagrange Bridge	FERC 2299-024, 1995 (Settlement Agreement) (94-301 TAF/yr)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
San Joaquin River					
San Joaquin River below Friant Dam/Mendota Pool	Full San Joaquin River Restoration Program flows, not constrained by current channel capacities, model implementation includes recapture on the lower San Joaquin River.	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Maximum salinity near Vernalis	Stanislaus contribution per New Melones SRP	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Minimum flow near Vernalis	Stanislaus contribution per New Melones SRP	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sacramento River–San Joaquin Delta Region					
Delta Outflow Index (flow and salinity)	SWRCB D-1641; X2 of 80 km in September and October of wet and above normal years with transitional flows in last half of August; modeled as In-Basin Use and shared according to COA Article 6(c).	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions, with additional flow provided by VAs	Same as Proposed Project plus Cumulative
Additional 100 TAF for Delta Outflow under ITP	SWP 100 TAF developed through export cut in Sacramento 40-30-30 Wet and AN years during spring, summer, or fall months to provide a flexible water block to enhance Delta Outflow. All or a portion of 100 TAF can be deployed in the current year or carried over in	Same as Baseline Conditions	Not operated	Same as Proposed Project	Same as Proposed Project

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
	Oroville for use in later years (subject to spill). Carryover use depends on WY: • **Critical:** SWP keeps water • **Dry:** Facilitate SMSCG operations • **BN/AN/W:** Augment outflow when necessary to meet X2 at 80KM				
Delta Cross Channel gate operation	SRWCB D-1641 with additional days closed from Oct 1 – Jan 31 based on water quality conditions, 2020 ROD and 2020 SWP ITP	Same as Baseline Conditions; Baseline Conditions Delta water quality calculations were not updated when closures occurred from Oct 1 – Jan 31.This has been revised. Delta water quality calculations consider additional days closed from Oct 1 – Jan 31.	Same as Baseline Conditions	Same as Baseline Conditions (Updated)	Same as Baseline Conditions (Updated)
South Delta export limits (Jones PP and Banks PP)	SWRCB D-1641 (additional 500 cfs allowed for Jul – Sep for reducing impact on SWP)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Combined Flow in Old and Middle River (OMR)	**Adult Delta Smelt (First Flush)** • *Trigger:* Freeport > 50 NTU & Freeport > 25,000 cfs • *Period:* December 1 to January 31 • *CalSim assumption:* Sacramento River Runoff > 20,000 then OMR = -2,000 cfs for 14 days	Same as Baseline Conditions	**Winter-Run Early Season Migration** • Not explicitly modeled **Adult Delta Smelt (First Flush)** • *Trigger:* Freeport > 50 NTU & Freeport > 25,000 cfs • *Period:* December 1 to January 31 • *CalSim assumption:* Sacramento River Runoff > 20,000 then OMR = -2,000 cfs for 14 days	Same as Proposed Project	Same as Proposed Project

Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Adult Delta Smelt (Turbidity Bridge) • January to March & Sacramento River Runoff > 20,000 • OMR = -2,000 cfs for 5 days		**Adult Delta Smelt (Turbidity Bridge)** • January to March & Sacramento River Runoff > 20,000 • OMR = -3,500 cfs for 10 days • Highflow Offramp when Vernalis flows above 10,000 cfs		
Adult Longfin Smelt Entrainment Protection • Not explicitly modeled		**Adult Longfin Smelt Entrainment Protection** • Historical monthly percentage by water year type: -3,500 to -5,000 cfs		
Larval and Juvenile Delta & Longfin Smelt • Larval Delta Smelt historical monthly percentage by water year type: -3,500 to -5,000 cfs; • Juvenile Delta Smelt, Larval Longfin Smelt and Juvenile Longfin Smelt were not explicitly modeled		**Larval and Juvenile Delta & Longfin Smelt** • Historical monthly percentage by water year type: -3,500 to -5,000 cfs • Highflow offramp when Rio Vista flows above 55,000 cfs or Vernalis flows above 8,000 cfs.		
Winter Run/Steelhead • Historical monthly percentage by water year type: -3,500 to -5,000 cfs		**Winter Run/Steelhead** • Weekly and Annual • Historical monthly percentage by water year type: -3,500 to -5,000 cfs		

OMR Flex (storm flex)
• If first flush or turbidity bridge are not triggered, then
• OMR = 6 days at OMR -6,250 cfs:
  ○ Delta in Excess,
  ○ X2< 81 km,
		OMR Flex (storm flex)
		• If first flush or turbidity bridge are not triggered, then
		• OMR = 6 days at OMR -6,250 cfs:		

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
	○ Sacramento River Runoff < 20,000 cfs, ○ Qwest > +1,000 cfs January and February		○ Delta in Excess, ○ X2< 81 km, ○ Sacramento River Runoff < 20,000 cfs, ○ Qwest > +1,000 cfs January and February		
Water Quality (EC) Standards	SWRCB D-1641	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Spring Outflow Requirement	Spring Maintenance Flow, modeled as maximum allowable SWP export is the maximum of 600 cfs or 40% of the total export under the SJR:IE regulation (listed below) when Delta outflow is less than 44,500 cfs. April to May when SJR < 21,750 cfs • Wet and Above Normal: SJR IE = 4:1 • **Below Normal:** SJR IE = 3:1 • **Dry:** SJR IE = 2:1 • **Critical:** SJR IE = 1:1 The Spring Outflow requirement may limit SWP exports by up to 150 TAF in San Joaquin Valley 60-20-20 Wet years.	Same as Baseline Conditions	As part of the SWP Delta Voluntary Agreement (VA), reduce SWP Exports during Delta Excess (or Restricted) Conditions OR Balanced Conditions when UWFE> 0 to increase Delta Outflow SWP export reduction by water year type (in TAF) are listed below: • 0 in **W** • 117.5 in **AN** • 92.5 in **BN** • 92.5 in **D** • 0 in **C** Decision based on dynamic monthly Sacramento Valley 40-30-30 water year type. Based on 90% Exceedance Forecast in March and April and 50% Exceedance in May.	Same as Proposed Project	Same as Proposed Project
Interim Operations Plan (IOP)	Maximum allowable CVP export is the maximum of 900 cfs or 60% of the total export under the SJR:IE regulation (listed below) when Delta outflow is less than 44,500 cfs.	Same as Baseline Conditions	Same as Baseline Conditions	Not operated	Not operated

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
	April to May when SJR < 21,750 cfs • Wet and Above Normal: SJR IE = 4:1 • **Below Normal:** SJR IE = 3:1 • **Dry:** SJR IE = 2:1 • **Critical:** SJR IE = 1:1 SWP does not operate to this outflow requirement.				
Summer/Fall Habitat (X2)	September to October • Wet and Above Normal years = 80 KM X2	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Summer/Fall Habitat (SMSCG)	**Salinity Trigger:** Use last 7-day average Martinez EC from previous month and compare against threshold values for triggering. May (17.5Ms/cm), June and July (22.2 mS/cm).	Same as Baseline Conditions	**Salinity Trigger:** Same as Baseline Condition	Same as Proposed Project	Same as Proposed Project
	Above Normal and Below Normal years = continuous SMSCG operations for up to 60 days in June through August. If EC triggered in June, operate gate June and July, otherwise operate July and August. CVP and SWP operations compensate for any change to salinity as a result of SMSCG operations.		**Above Normal and Below Normal years** = 7 days on 7 days off SMSCG operations for up to 60 days in June through October. If EC triggered in June, operate gate June-September, otherwise operate July-October. CVP and SWP operations compensate for any change to salinity as a result of SMSCG operations.		

Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
Dry years following Wet and Above Normal years = continuous SMSCG operations for up to 60 days in June through August and limited to the amount of 100 TAF water carried over from previous year to compensate for increased salinity costs. If EC triggered in June, operate gate June and July, otherwise operate July and August. CVP and SWP operations compensate for any change to salinity as a result of SMSCG operations.		**Dry years following Wet and Above Normal years** = 7 days on 7 days off SMSCG operations for up to 60 days in June through October. If EC triggered in June, operate gate June-September, otherwise operate July-October. CVP and SWP operations compensate for any change to salinity as a result of SMSCG operations.		
Dry years following Below Normal years = continuous SMSCG operations for up to 30 days in June through August. If EC triggered in June or July, operate for entire month. If operation is not triggered in neither June nor July, gate operate entire August. SWP operations compensate for any change to salinity as a result of SMSCG operations.		**Dry years following Below Normal years** = 7 days on 7 days off SMSCG operations for up to 30 days in June through September. If EC triggered in June or July, operate for two months. If operation is not triggered in neither June nor July, gate operate August-September. CVP and SWP operations compensate for any change to salinity as a result of SMSCG operations.		
SMSCG gate operations are considered when estimating salinity at D1641 water quality compliance locations.		**SMSCG gate operations** (including 7 days on, 7 days off) are considered when estimating salinity at D1641 water quality compliance locations.		

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
OPERATIONS CRITERIA: RIVER-SPECIFIC					
Sacramento River Region					
Upper Sacramento River: Flow objective for navigation (Wilkins Slough)	Flow objective of 3,250–5,000 cfs based on month, CVP NOD agricultural allocation, and Shasta storage to reflect CVP operations for local delivery	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
American River: Folsom Dam flood control	Fixed 400 TAF flood control diagram	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sacramento VA	None	None	None	April-May pulse flows in Sac 40-30-30 WY type AN/BN/D years, protected through Delta. Source of water is 25,000 acres of land fallowing. 95 taf total provided in AN/BN years. Permanent State Water Purchases and PWA Market Price Water Purchases, listed below by Sacramento Valley water year type, are applied via post-processing: • 123 TAF in **W** • 97 TAF in **AN** • 54 TAF in **BN** • 153 TAF in **D** • 65 TAF in **C**	Same as Proposed Project plus Cumulative
Feather VA	None	None	None	April-May pulse flows of 60 taf in Sac 40-30-30 WY type AN/BN/D years, protected through Delta. Source of water is 10,000 acres of land fallowing. Releases can continue	Same as Proposed Project plus Cumulative

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
				later in year depending on spills.	
American VA	None	None	None	Mar-May flows in all but Sac 40-30-30 WY type Wet years, protected through Delta. Water sources are GW substitution and reservoir reoperation. 10 taf in AN/BN years, 40 taf in D years, 30 taf in C years.	Same as Proposed Project plus Cumulative
Mokelumne VA	None	None	None	Additional flow of 45 taf in AN years, 20 taf in BN years, 10 taf in D years, based on Mokelumne JSA WY type. 79% of water released in Mar-May and 21% in October. Water provided through reservoir reoperation. Not protected through Delta.	Same as Proposed Project plus Cumulative
Yuba VA	None	None	None	April-June flows of 50 taf in Sac 40-30-30 WY type AN/BN/D years, provided through reservoir reoperation and protected through Delta. Timeseries of flows provided by Yuba Water Agency.	Same as Proposed Project plus Cumulative
Putah Creek VA	None	None	None	Additional flow of 6 taf in November-May provided in all but Sac 40-30-30 WY type Wet years through reservoir reoperation. Not protected through Delta.	Same as Proposed Project plus Cumulative

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
San Joaquin River Region					
Stanislaus River: Flow below Goodwin Dam	Flows per New Melones SRP	Same as Baseline Conditions	Same as Baseline Conditions	Flows per New Melones SRP with modified Winter Instability Flows, using 90% forecast of San Joaquin 60-20-20 WY type	Same as Proposed Project plus Cumulative
Friant VA	None	None	None	50 taf flow contribution in February-May in 60-20-20 Dry, Normal-Dry, and Normal-Wet years, protected through Delta. Met through Friant flood releases. San Joaquin River Basin minimum placeholder contributions and San Joaquin Basin Portion of Gap, listed below by San Joaquin Valley water year type, are applied via post-processing: • 0 TAF in **W** • 122 TAF in **AN** • 181 TAF in **BN** • 156 TAF in **D** • 48 TAF in **C**	Same as Proposed Project plus Cumulative
Sacramento – San Joaquin River Delta Region					
Delta VA	None	None	None	Additional Delta outflow provided Mar-May through export cuts and PWA water purchase program, based on Sac 40-30-30 WY type. CVP provides a total of 27, 147, 107, 86, and 2 taf in W, AN, BN, D, and C years respectively. SWP provides a total of 117.5	Same as Proposed Project plus Cumulative

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
				taf in AN years and 92.5 taf in BN/D years. SWP Delta VA described in "Spring Outflow Requirement".	
OPERATIONS CRITERIA: SYSTEMWIDE					
CVP water allocation					
Settlement/ Exchange	100% (75% in Shasta critical years)	Same as Baseline Conditions	Same as Baseline Conditions	Maximum potential allocation of 100% (75%/77% in Shasta critical years); Settlement allocation reduced to cut up to 500 TAF in Shasta Bin3B years as needed to meet Shasta carryover target to reflect SRSC contribution	Same as Proposed Project plus Cumulative
Refuges	100% (75% in Shasta critical years)	Same as Baseline Conditions	Same as Baseline Conditions	NOD Refuge allocation reduced to SRSC level in Bin3B years if less than base refuge allocation	Same as Proposed Project plus Cumulative
Agriculture Service	100% - 0% based on supply. South-of-Delta allocations are additionally limited due to D-1641 and 2020 ROD export restrictions	Same as Baseline Conditions	Same as Baseline Conditions	100%-0% based on supply, South-of-Delta allocations are additionally limited due to D-1641 and OMR action; Additional allocation reductions taken to address Shasta action carryover target	Same as Proposed Project plus Cumulative
Municipal & Industrial Service	100% - 50% based on supply. South-of-Delta allocations are additionally limited due to D-1641 and ROC on TLO export restrictions	Same as Baseline Conditions	Same as Baseline Conditions	100%-50% based on supply, South-of-Delta allocations are additionally limited due to D-1641 and OMR action; 25% in Shasta Bin3B years	Same as Proposed Project plus Cumulative

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
SWP water allocation					
North of Delta (FRSA)	Contract-specific NOD Allocation Settlement Agreement terms for Napa and Solano	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
South of Delta (including North Bay Aqueduct)	Based on supply; equal prioritization between Ag and M&I based on Monterey Agreement; allocations are limited due to D-1641, 2020 ROD, and 2020 SWP ITP export restriction NOD Allocation Settlement Agreement terms for Napa and Solano	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
CVP-SWP coordinated operations					
Sharing of responsibility for in-basin-use	According to Coordinated Operations Agreement (2018), sharing responsibility for meeting Sacramento Valley In-basin use during balance condition with water year type in percentage for CVP and SWP, respectively are: • 80/20 in **W/AN** • 75/25 in **BN** • 65/35 in **D** • 60/40 in **C** As per NAPA agreement, FRWP and EBMUD 2/3 of the North Bay Aqueduct diversions are considered as Delta export, 1/3 of the North Bay Aqueduct diversion is considered as in-basin use	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sharing of surplus flows	According to Coordinated Operations Agreement (2018), CVP and SWP sharing responsibility during Unstored Water for Export (UWFE) during balanced condition	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
	for all year type is 55% and 45%, respectively.				
Sharing of restricted export capacity for project- specific priority pumping	The percentage sharing of export capacity under export limits due to (1) SWRCB D-1641, 2020 ROD and 2020 SWP ITP export restrictions • 60/40 CVP/SWP during excess conditions • 65/35 CVP/SWP during balanced conditions • No restrictions on Inter-tie use to meet these shares	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Water transfers	Acquisitions by SWP contractors are wheeled at priority in Banks Pumping Plant over non-SWP users; LYRA included for SWP contractors[3]	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Sharing of export capacity for lesser priority and wheeling-related pumping	Cross Valley Canal wheeling (max of 128 TAF/yr), CALFED ROD defined Joint Point of Diversion (JPOD)	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
San Luis Reservoir	San Luis Reservoir is allowed to operate to a minimum storage of 80 TAF	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
CVPIA 3406(b)(2)					
Policy Decision	Per May 2003 Dept. of Interior decision	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Allocation	800 TAF, 700 TAF in 40-30-30 dry years, and 600 TAF in 40-30-30 critical years as a function of Ag allocation	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions
Actions	Pre-determined upstream fish flow objectives below Whiskeytown Dams, non-discretionary NMFS BO (Jun 2009) actions for the American and Stanislaus Rivers, and NMFS BO (Jun 2009) and FWS BO (Dec 2008) actions leading to export	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

	Baseline Conditions	Baseline Conditions (Updated)	Proposed Project	Proposed Project plus Cumulative	Alternative 1 plus Cumulative
	restrictions. These are not currently modeled				
Accounting Adjustments	Releases for non-discretionary FWS BO (Dec 2008) and NMFS BO (Jun 2009) actions may or may not always be deemed (b)(2) actions; in general, it is anticipated, that accounting of these actions using (b)(2) metrics, the sum would exceed the (b)(2) allocation in many years; therefore no additional actions are considered and no accounting logic is included in the model	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions	Same as Baseline Conditions

Notes:

[1] The Sacramento and San Joaquin Valleys reflect land-use based on the average from 2004 – 2013. Urban demand is represented with the 2015 UWMPs.

[2] It is assumed that SWP Contractors can take delivery of all Table A allocations and Article 21 supplies. Article 56 provisions are assumed and allow for SWP Contractors to manage storage and delivery conditions such that full Table A allocations can be delivered. Detailed analysis of the South Coast and Tulare regions support these assumptions. NBA Article 21 deliveries are dependent on excess conditions only, all other Article 21 deliveries also require that San Luis Reservoir be at capacity and that Banks PP and the California Aqueduct has available capacity to divert from the Delta for direct delivery.

[3] Acquisitions of Component 1 water under the Lower Yuba River Accord and use of 500 cfs dedicated capacity at Banks PP during Jul – Sep, are assumed to be used to reduce as much of the impact of the Apr-May fish related Delta export restrictions on SWP contractors as possible.

[4] Current ACOE permit for Banks PP allows for an average diversion rate of 6,680 cfs in all months. Diversion rate can increase up to 1/3 of the rate of San Joaquin River flow at Vernalis during Dec 15th – Mar 15th up to a maximum diversion of 10,300 cfs, if Vernalis flow exceeds 1,000 cfs.

The CalSim 3 model was used to quantify the changes in river flows, delta channel flows, exports, and water deliveries. Figure 4J-21 through Figure 4J-29 show CalSim 3 simulation results for the following scenarios under cumulative conditions: Baseline Conditions (navy lines), Proposed Project (green lines), and Alternative 1 (brown lines). The plots presented below are relevant for assessing whether the conclusions in the hydrology, water quality, and aquatic biological resources analyzed for the Proposed Project under cumulative conditions in the EIR hold under the changes incorporated with Alternative 1.

As described for historical and climate change conditions in the sections above, incremental changes in monthly long-term average flows are largely similar under cumulative conditions for the Proposed Project and Alternative 1 for the selected parameters. All locations show nearly identical long-term average monthly trends for both the Proposed Project and Alternative 1, even with the differences in deployment of the fallow inject and representation of the Clifton Court Forebay diversion window. The inclusion of cumulative projects in these scenarios also appears to limit the minor responses that were displayed under historical and climate change conditions. Annual trends for Delta exports also show little difference between the Proposed Project and Alternative 1 under cumulative conditions.

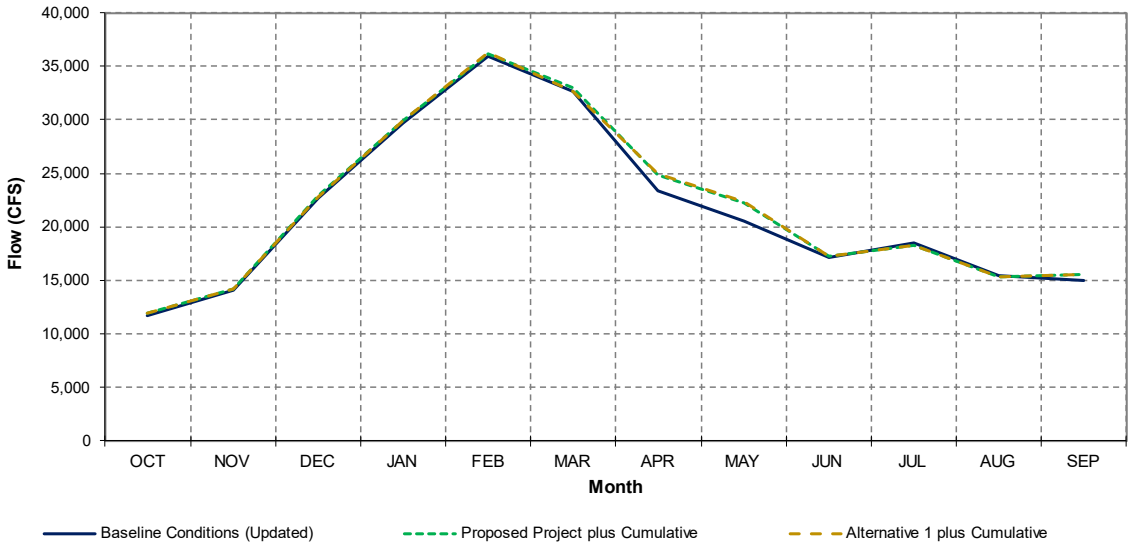

Figure 4J-21. Sacramento River at Freeport Monthly Long-term Average Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

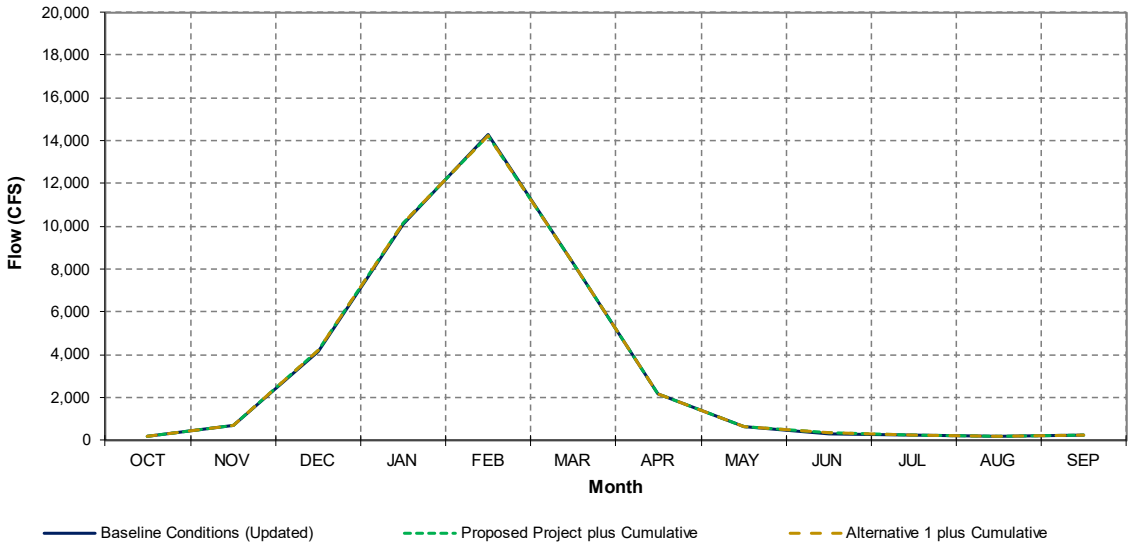

Figure 4J-22. Monthly Long-term Average Yolo Bypass Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

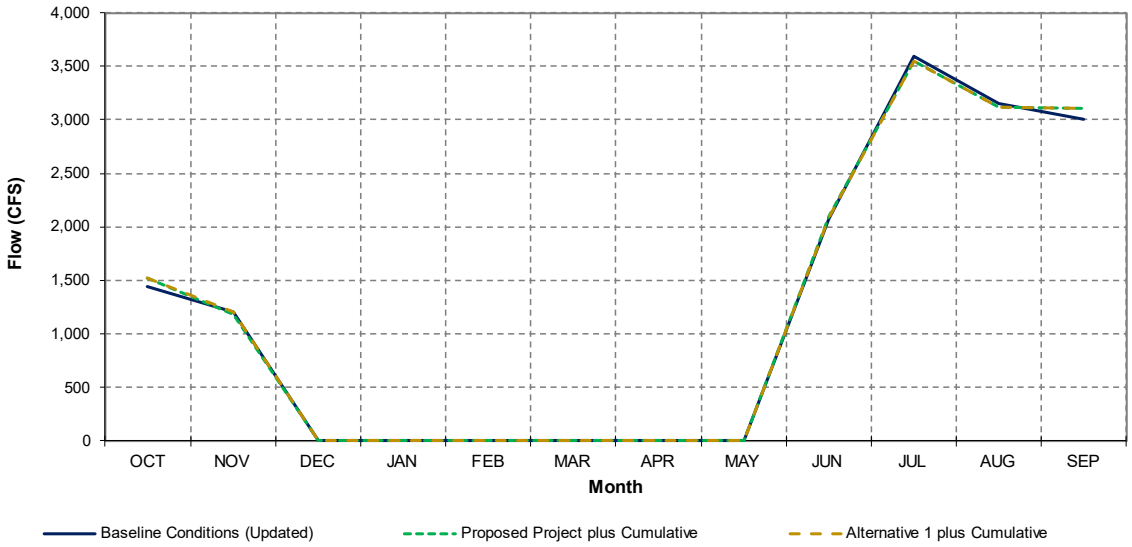

Figure 4J-23. Monthly Long-term Average Delta Cross Channel Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

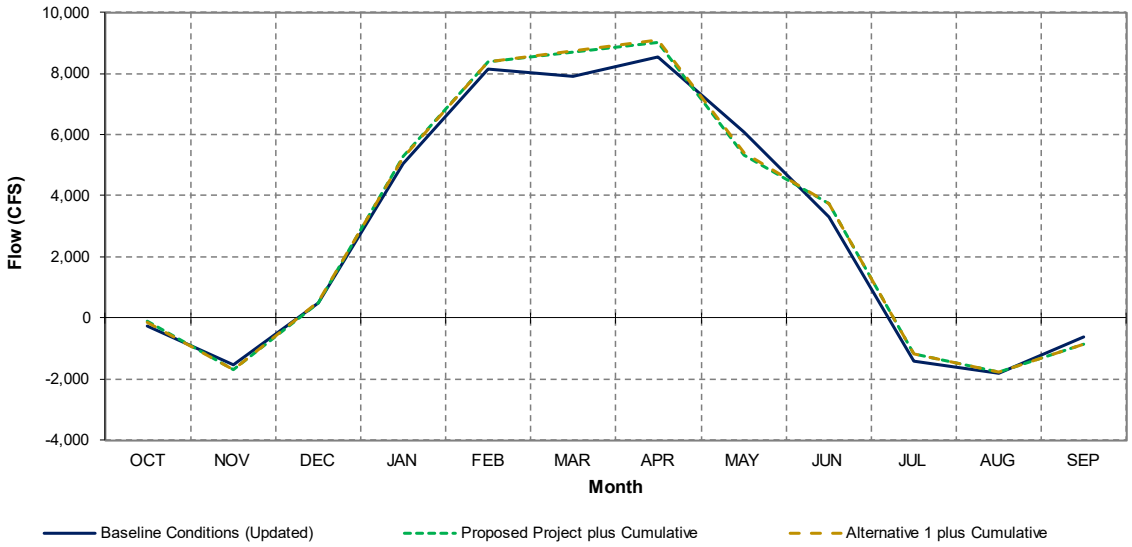

Figure 4J-24. Monthly Long-term Average QWEST Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

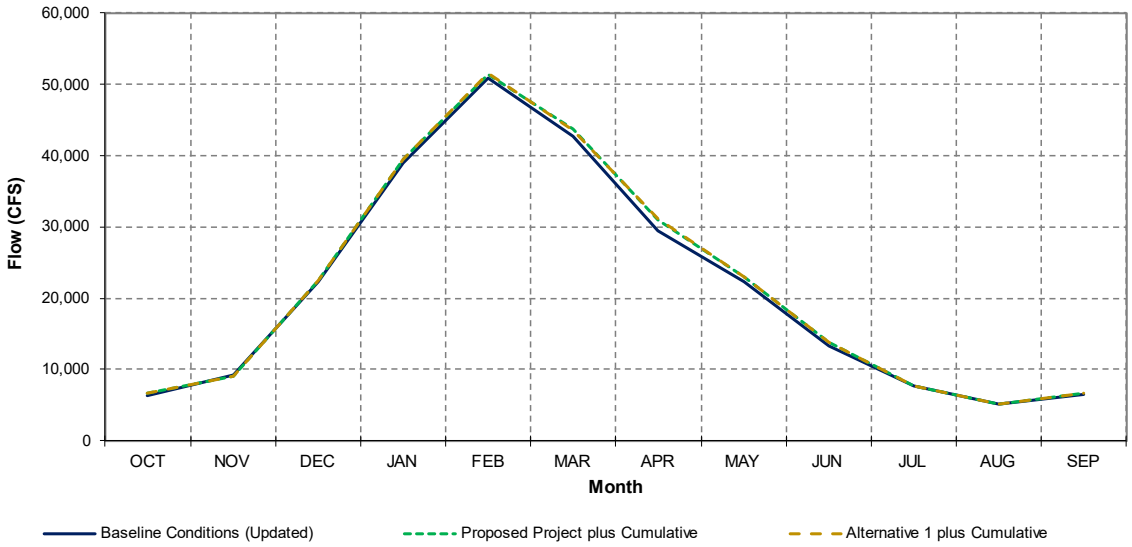

Figure 4J-25. Monthly Long-term Average Delta Outflow for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

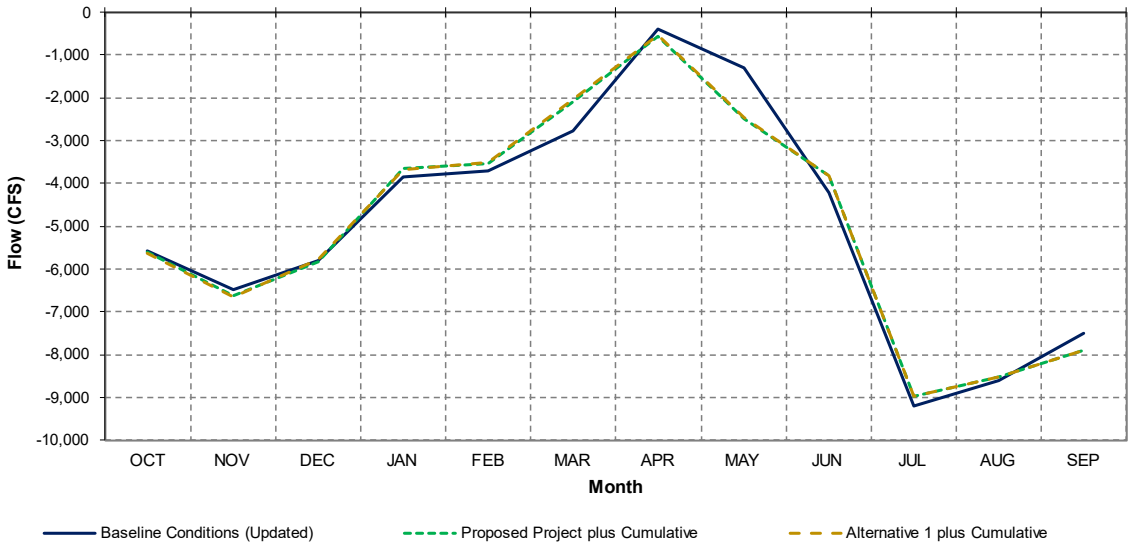

Figure 4J-26. Monthly Long-term Average Combined Old and Middle River Flow for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

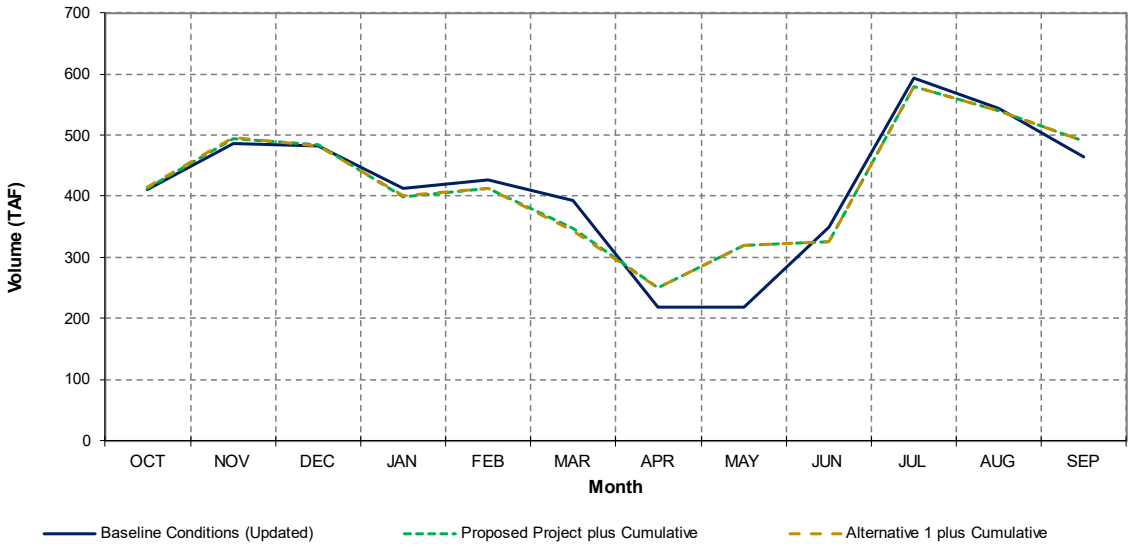

Figure 4J-27. Monthly Long-term Average Delta Exports for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

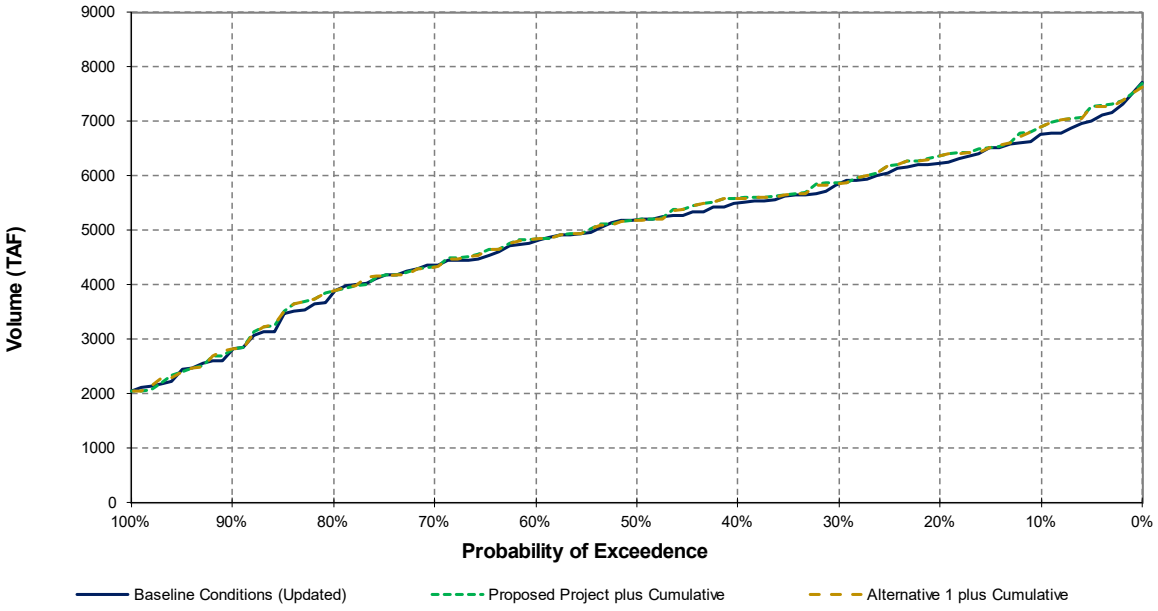

Figure 4J-28. Annual Delta Exports for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

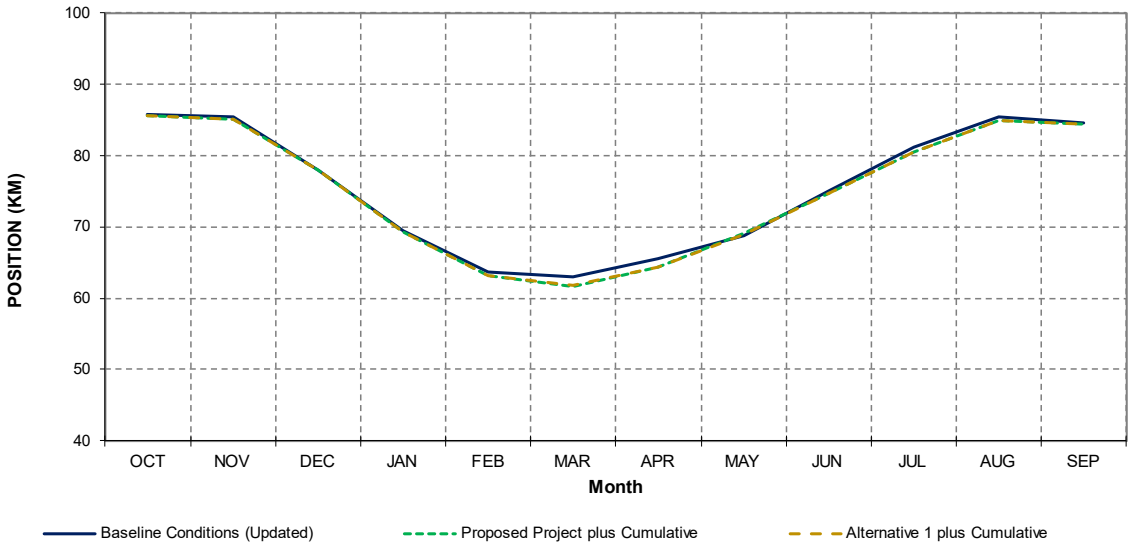

Figure 4J-29. Monthly Long-term Average X2 Position for the Baseline Conditions, Proposed Project, and Alternative 1 under Cumulative Conditions

4J.5 Conclusion

Based on the findings from the comparisons between the Proposed Project and Alternative 1 under historical, climate change, and cumulative conditions, it is assumed that the Proposed Project and Alternative 1 will perform similarly under additional modeled considerations in Appendices 4D through 4I. Changes to the deployment of the fallow inject and representation of the Clifton Court Forebay diversion window under Alternative 1 lead to near-negligible shifts in long-term average trends in flow and exports.