Executive Summary

This North-of-the-Delta Offstream Storage (NODOS) Investigation (Feasibility Report) evaluates new offstream surface water storage north of the Sacramento-San Joaquin Delta (Delta). Created for the NODOS Investigation, this Feasibility Report presents potential plans to accomplish the Sites Reservoir Project’s (Project’s) objectives and makes recommendations for further action.

Construction of the Project would be led by the Sites Project Authority (Authority), a joint exercise of powers authority. The Feasibility Report, along with the 2017 Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), will be used by the Secretary of the Interior (Secretary) and U.S. Congress to determine both the type and extent of Federal interest in the Project.

Background

The NODOS Investigation would add a new offstream storage facility northwest of Sacramento, California. Sites Reservoir would store water that is diverted from the Sacramento River for later release by beneficiaries throughout the state of California. The reservoir would provide additional water supply for agriculture and municipal and industrial (M&I) purposes, Central Valley Project (CVP) operational flexibility, benefits to anadromous fish, Incremental Level 4 (IL4) water supply for Central Valley Project Improvement Act (CVPIA) refuges, Delta ecosystem enhancement, flood damage reduction, and recreation. In addition to the potential Federal interest, beneficiaries would include the State of California and the membership of other Authority.

NODOS was one of five potential surface water storage projects identified by the CALFED Bay-Delta Program (CALFED). In 2001, the U.S. Department of the Interior, the Bureau of Reclamation (Reclamation), and the California Department of Water Resources (DWR) began appraisal-level studies of the potential for new storage north of the Delta for water supply reliability needs. The appraisal-level studies evaluated reservoirs to as much as 2-million acre-feet (MAF) capacity.

Reclamation was directed by Public Law 108-7 (Omnibus Appropriations Act of 2003) to conduct a feasibility-level investigation for NODOS. The Sites Reservoir Project was further developed through public outreach and preparation of draft environmental documentation in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

Sites Project Authority

The Authority was formally established on August 26, 2010, as a joint exercise of powers authority in conformance with State law. The Authority will be responsible for constructing, operating, and maintaining the Sites Reservoir Project.
The current Authority membership (nine voting positions with 15 members) consists of Glenn County, Colusa County, Reclamation District 108, Glenn-Colusa Irrigation District (GCID), Tehama-Colusa Canal Authority (TCCA), Maxwell Irrigation District, Colusa County Water District, Westside Water District, Western Canal Water District, TC-4, City of Sacramento / Sacramento County Water Agency, and Placer County Water Agency / City of Roseville. Reclamation and DWR are non-voting Board members.

**Study Area**

The Draft EIR/EIS describes three study areas that were developed to evaluate potential Project impacts: the Extended, Secondary, and Primary study areas.

**Extended Study Area:** The Extended Study Area, consisting of the CVP and State Water Project (SWP) service areas, is the largest and most diverse of the three study areas in terms of size, geography, land use, and habitat conditions. Given that no construction will occur in this study area, it is expected to experience minor effects with respect to changed operations and conditions. Changes in conditions at the CVP and SWP facilities located south of the Delta (including the San Luis Reservoir) are considered within the Extended Study Area. Changes within the CVP and SWP service areas, resulting only from changes in CVP and/or SWP water deliveries, are also considered within the Extended Study Area.

**Secondary Study Area:** The Secondary Study Area is smaller than the Extended Study Area and consists of the majority of CVP and SWP facilities that could be affected by potential operations associated with certain Project alternatives; this study area has been described and evaluated in the Draft EIR/EIS in more detail than the Extended Study Area. The Secondary Study Area consists of the geographical area with CVP and SWP facilities located north of the Delta and in the Delta, and the streams downstream of the CVP and SWP reservoirs that could experience water surface elevation fluctuations or stream flow changes. Those facilities are located in the following 18 counties: Alameda, Butte, Colusa, Contra Costa, Del Norte, El Dorado, Glenn, Humboldt, Placer, Sacramento, Santa Clara, Shasta, Solano, Sutter, Tehama, Trinity, Yolo, and Yuba. Operational changes could occur as a result of the coordinated and integrated operation of the Project’s facilities with State and Federal projects that are located on the American River, Trinity River, Clear Creek, Sacramento River, Sutter Bypass, Yolo Bypass, Feather River, and the Delta.

**Primary Study Area:** The Primary Study Area is the focus of the resource evaluations in this Feasibility Report and the Draft EIR/EIS. The Primary Study Area includes the areas within Glenn and Colusa counties where short-term and long-term direct and indirect effects from constructing, operating, and/or maintaining the proposed Project facilities may occur.

**Problems, Needs, and Opportunities**

**Water Supply**

Water agencies throughout California are susceptible to dry-year deficiencies and are especially vulnerable to droughts. During extended droughts, reduced water availability eventually forces water users to either replace surface water supply by using groundwater, if they have this capability, or
remove agricultural acreage from production (DWR 2005). Additional use of groundwater supplies during droughts may result in adverse impacts, such as reduced groundwater quality or ground subsidence and groundwater overdraft. There is a need for additional water supply to provide drought resilience to local water agencies.

**CVP Operational Flexibility**
The CVP is operated to meet a variety of project purposes, including providing water for irrigation and domestic uses, fish and wildlife mitigation, fish and wildlife enhancement, and water quality. The CVP has the potential to deliver about 7 MAF annually to agricultural and M&I customers in addition to environmental purposes. California’s Federal and State water systems have limited flexibility in timing, location, and capacity to meet the multiple purposes of the projects due to operational and demand constraints. Although the annual delivery capability of 7 MAF exists, actual deliveries have been much lower in recent years. For example, approximately 4.8 MAF were delivered for agricultural and M&I users on average between 2009 and 2014, with a high of 6.1 MAF in 2011 and a low of 2.9 MAF in 2014. There are several factors that have significantly affected the availability of the CVP to store and provide water for contract delivery: Delta pumping constraints; the establishment of three major regulations – the CVPIA, State Water Resources Control Board Decision 1641, and the Reasonable and Prudent Alternatives from the 2008/2009 Biological Opinions on Long-Term Operation of the CVP and SWP; and natural variations in water supply based on annual precipitation. These factors diminished CVP project deliveries to meet Project purposes. Constraints vary annually based on governing conditions that would result in water available for a particular purpose in any year being restricted for that purpose but potentially being available to serve an alternate CVP project purpose.

The Operational Flexibility purpose, according to the Water Infrastructure Improvements for the Nation (WIIN) Act, is defined as the benefit accruing to the Federal Government from an increased ability to allocate additional water supplies through an investment by the United States in a water supply project. The investment would enable the Federal Government to deliver benefits and better meet a project’s purposes by increasing the efficiency, reuse, or multiple use of existing supplies or by reducing impacts of regulatory or capacity constraints on an existing Reclamation project.

The NODOS Project would provide additional water to relieve some of the existing operational constraints in the CVP system, and meet obligations under State and Federal law. This would include providing environmental benefits to anadromous fish, refuges, and water quality, as well as CVP yield diversification through new facilities. Operational flexibility water would be part of the CVP allocation, and the scheduling and delivery for any specific purpose would be subject to water right permit conditions and contractual requirements.

**IL4 Water Supply to CVPIA Refuges**
Section 3406 (d) of the CVPIA requires the Secretary of the Interior to provide firm water supplies of suitable quality to maintain and improve 19 identified wetland habitat areas in the Central Valley of California. Section 3406 (d)(2) directs Reclamation to supplement Level 2 water supplies to the full Level 4, which would enable optimum habitat management to support a broad range of species, including targeted threatened and endangered species. The Reclamation Refuge Water Supply Program (RWSP), created to implement Section 3604 (d) of the CVPIA, is administered by Reclamation and includes a U.S. Fish and Wildlife Service (USFWS) representative. The RWSP is tasked with delivering Level 2 water supplies to the refuges and acquiring and delivering IL4 water
supplies, including the construction of conveyance facilities to provide the capacity to deliver full Level 4 supplies to the refuges. The annual volumes of these acquisitions have varied historically, reflecting funding levels, hydrologic conditions, conveyance capacity to the refuges, and availability of conveyance capacity through the Delta. The RWSP has relied primarily on short-term water purchases and exchanges, and on a few medium- and long-term contracts to meet IL4 requirements; limited amounts of long-term water have been secured due to diminishing supplies and escalating costs. There is a need for additional IL4 water supplies to CVPIA refuges.

**Anadromous Fish**

Anadromous fish in the Sacramento River watershed are sensitive to water temperature. When California reservoirs are relatively full, the cold water released from the hypolimnion (the cold, non-circulating layer of water that lies below the thermocline in a thermally stratified lake) provides cooler water in the summer to downstream reaches. Since the early 1980s, reservoirs have been drawn down because of increased water demands, resulting in warmer water releases and higher egg mortality rates. The warmer water temperatures have especially harmed winter-run Chinook salmon, which spawn in spring and summer. There is a need for additional cold water to support anadromous fish in the Sacramento River watershed.

**Delta Ecosystem Enhancement**

Since 2004, monitoring programs in the Delta have documented a decline of several pelagic (open-water) fishes (Delta smelt, longfin smelt, juvenile striped bass, and threadfin shad) in the freshwater portion of the estuary. The decline may have several causes, but reduced food availability is a contributing factor. Additional food resources are needed in the lower Cache Slough and lower Sacramento River areas to sustain Delta smelt and other estuarine-dependent species (e.g., Delta smelt, longfin smelt, Sacramento splittail, starry flounder, and California bay shrimp).

DWR and CDFW performed a pilot study in collaboration with other agencies and farmers in the summer of 2016 that released water into the Delta through a wetland and tidal slough corridor. Monitoring showed that the nutrient-rich “pulse flow” resulted in a phytoplankton bloom and enhanced zooplankton growth and egg production. With the NODOS Sites Reservoir Project there is an opportunity to provide a dedicated source of water to convey water through the wetland and tidal slough corridor to provide a sustainable source of food for Delta species.

**Planning Objectives, Constraints, and Considerations**

This section discusses the planning objectives, constraints, and considerations specific to the NODOS Investigation.

**National Planning Objectives**

The Federal objective is defined in the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (WRC 1983), which focuses on national economic development. The National Water Resources Policy defined in the *Water Resources Development Act of 2007* (Public Law [P.L.]110-114, Section 2031), also specifies that Federal water resources investments should reflect national priorities, encourage sustainable economic development, and protect people and the natural environment.
Investigation-Specific Planning Objectives

The NODOS Investigation planning objectives were developed based on identified water resources problems, needs, and opportunities in the study area and specific direction in the study authorization. Planning objectives evolved over the course of the study. An initial objective for improvement of Delta Environmental and Export Water Quality was used for the evaluation of initial alternatives, but later refined and replaced with CVP Operational Flexibility and Delta Ecosystem Enhancement. Similarly, an initial secondary objective for sustainable hydropower was later dropped. The objectives for the final, refined analysis of alternatives are described below.

Final Primary Objectives

- **Water Supply:** The NODOS Sites Reservoir Project would provide increased water supply and improve the reliability of water deliveries for municipal, industrial, and agricultural uses, especially during drought conditions.

- **CVP Operational Flexibility:** CVP Operational Flexibility is the benefit accruing to the Federal Government from an increased ability to allocate additional water supplies through an investment by the United States in a water supply project. The investment would enable the Federal Government to deliver benefits and better meet project purposes by increasing the efficiency, reuse, or multiple use of existing supplies or by reducing the impacts of regulatory or capacity constraints on an existing Reclamation project. The NODOS Sites Reservoir Project would provide additional water to relieve some of the existing operational constraints in the CVP system, and meet obligations under Federal and State law. This would include providing environmental benefits to anadromous fish, refuges, and water quality, as well as providing CVP yield diversification through new facilities.

- **Anadromous Fish:** The NODOS Sites Reservoir Project would benefit anadromous fish (including endangered winter-run Chinook salmon) and other aquatic species by improving temperatures in the Sacramento, Feather, and American rivers. Conserving higher storage levels in CVP reservoirs to be used for operational flexibility provides a distinct opportunity for benefits through the preservation of coldwater pools; it also improves downstream water temperature management in Below Normal, Dry, and Critical water years.

- **IL4 Water Supply for CVPIA Refuges**: The NODOS Sites Reservoir Project would provide water that is needed to meet the IL4 refuge water supply demands established in the CVPIA (P.L. 102-575, Title 34). IL4 refuge water supply obligations established by the CVPIA are not being fully met at all refuges.

- **Delta Ecosystem Enhancement**: The NODOS Sites Reservoir Project would enhance the Delta ecosystem by providing water to convey food resources from the floodplain to the Delta, thereby improving the food chain and quality of the Delta’s estuarine habitat for use by Delta smelt and other species.

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1 This objective is one of the two ecosystem benefits accepted by the California Water Commission that grants the NODOS Sites Reservoir Project the eligibility for the Water Storage Investment Program funding. The California Department of Fish and Wildlife is the authorized agency to oversee the implementation of this benefit.

2 This objective is one of the two ecosystem benefits accepted by the California Water Commission that grants the NODOS Sites Reservoir Project the eligibility for the Water Storage Investment Program funding. The California Department of Fish and Wildlife is the authorized agency to oversee the implementation of this benefit.
Final Secondary Objectives

- **Flood Damage Reduction**: The NODOS Sites Reservoir Project would provide an opportunity to reduce flooding in local watersheds.

- **Recreation**: Recreation in the immediate vicinity of the NODOS Sites Reservoir Project would provide opportunities for hiking, fishing, camping, boating, and mountain biking.

Directives and Planning Considerations

Various Federal, State, and local authorizations and directives, as listed below, provide guidance and other considerations specific to the NODOS Investigation, which informed the development of alternatives.

- Title III, Subtitle J, of the 2016 *Water Infrastructure Improvements for the Nation Act* (P.L. 114-322) includes provisions for Federal investments in water storage projects. Section 4007 of the act requires the Secretary of the Interior to determine that a proposed state-led storage project is feasible in accordance with Reclamation laws and secure agreement(s) for upfront funding of the non-Federal share of the capital cost. Under the WIIN Act, the Secretary can participate in up to 25 percent of the total cost of a State-led project, such as the NODOS Sites Reservoir Project. Pursuant to Section 4007(c)(2)(C) of the WIIN Act, the Secretary must find that a proportionate share of the Project’s benefits are Federal benefits.

- The objectives for the NODOS Investigation are consistent with the CALFED Programmatic Record of Decision (CALFED 2000a), signed by the Secretary of the Interior, which called for the investigation of new storage north of the Delta.

- The California *Water Quality, Supply, and Infrastructure Improvement Act of 2014* (Proposition 1) provided $2.7 billion for California water supply infrastructure projects and designated the California Water Commission as the State agency responsible for allocating these funds through the Water Storage Investment Program. The Authority applied for funding in August 2017, the California Water Commission made an initial funding decision of up to $816 million towards construction, including $40.8 million in early funding to support preconstruction activities.

Formulation of Alternative Plans

This Feasibility Report and its associated Draft EIR/EIS develop, evaluate, and compare four initial project alternatives (Alternatives A, B, C, and D) to the No Project Alternative. Prior to developing alternatives, a variety of reservoir locations and conveyance options were screened. Each resulting alternative, other than the No Project Alternative, addresses in varying degrees all of the NODOS planning objectives. The alternatives are the culmination of the plan formulation process (see Appendix A) and numerous studies, and the alternatives span the range of facilities and actions needed to support the goals and objectives, and the Federal decision making. The lead agencies may need to consider variations on these alternatives for permits and project construction. Should

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3 This objective is one of the public benefits accepted by the California Water Commission under the Water Storage Investment Program funding.

4 This objective is one of the public benefits accepted by the California Water Commission under the Water Storage Investment Program funding.
alternative facilities, operations, or alternatives be developed, a post-authorization report would be needed to confirm benefits and costs.

**No Project Alternative**
The No Project Alternative provides a basis of comparison for evaluating the potential benefits, and effects of the alternative plans.

**Cooperative Operations for Project Alternatives**
All project alternatives were developed to improve the operational flexibility of the California water system (CVP, SWP, and systems operated by local water agencies). The benefits from Sites Reservoir (Figure ES-1) could be appreciably enhanced through cooperative operations with Shasta Lake to conserve the cold water stored in Shasta Lake throughout the summer and to support appropriate water temperatures in the Sacramento River during summer months, especially in drought years. This would be accomplished by using water stored in Sites Reservoir to conserve water in Shasta Lake for the benefit of anadromous fish. The water would be released from Sites Reservoir to meet Reclamation’s environmental obligations and a portion of the CVP contract obligations in lieu of releases from Shasta Lake (CVP water deliveries would be made to CVP contractors downstream of Sites Reservoir in accordance with their existing CVP contracts). This would conserve water in Shasta Lake, allowing the coldwater pool to be maintained at higher levels than would be achievable without cooperative operations. Similar benefits could be achieved through cooperative operations with Folsom Lake (and Lake Oroville in the SWP). The cooperative operations would be implemented through the coordination of water rights and contractual foundations in partnership with the Authority, Reclamation, and DWR.

**Initial Alternatives**

**Small Reservoir with New Diversion (Initial Alternative A)**
Alternative A is a 1.3-MAF reservoir with a new intake (2,000 cubic feet per second [cfs]) on the Sacramento River (Delevan Intake). Alternative A operations would deliver water for agricultural and M&I purposes (with approximately 82 percent exported), Delta Environmental and Export Water Quality, Anadromous Fish benefits, and IL4 Water Supply for CVPIA Refuges.

This reservoir would require six saddle dams and two main dams (i.e., Sites Dam and Golden Gate Dam). Water would be diverted to fill the reservoir using the Tehama-Colusa Canal, GCID Main Canal, and Delevan Pipeline. The Delevan Intake Pumping/Generating Plant would be a new screened intake on the Sacramento River capable of pumping up to 2,000 cfs, and releasing up to 1,500 cfs back to the river.

**Large Reservoir with Existing Diversions (Initial Alternative B)**
Alternative B is the same as Alternative A, but has a 1.8-MAF reservoir, and it does not include a new intake on the Sacramento River. Alternative B operations would deliver water for agricultural and M&I supply (with approximately 90 percent exported), Delta Environmental and Export Water Quality, Anadromous Fish benefits, and IL4 Water Supply for CVPIA Refuges. The reservoir would require nine saddle dams and two main dams (i.e., Sites Dam and Golden Gate Dam). The main dams would be larger than they are under Alternative A.
Figure ES-1. Setting for NODOS Feasibility Study
The Delevan Pipeline would allow the release of up to 1,500 cfs back to the Sacramento River. The Delevan Intake Pumping/Generating Plant is not included in this alternative. With only the two existing diversions, it would be more difficult to fill the reservoir than it would be for the other project alternatives, which have three diversions. No new electric power transmission lines to the Delevan Pipeline release structure would be needed.

**Large Reservoir with New Diversion (Initial Alternative C)**

Alternative C (Figure ES-2) is the same as Alternative A, except that it uses a 1.8-MAF reservoir. Alternative C operations would deliver water for agricultural and M&I purposes (with approximately 84 percent export), Delta Environmental and Export Water Quality, Anadromous Fish benefits, and IL4 Water Supply for CVPIA Refuges. The larger reservoir under this alternative would require more saddle dams than are needed for Alternative A. The main dams (i.e., Sites Dam and Golden Gate Dam) would also be larger under this alternative than they are under Alternative A.

The Delevan Pipeline Intake Pumping/Generating Plant would include a new screened intake capable of pumping up to 2,000 cfs from the Sacramento River and releasing up to 1,500 cfs back to the river.

**Local Alternative, including Large Reservoir with New Diversion (Initial Alternative D)**

Alternative D (Figure ES-2) has been developed by the Authority. The facilities in this alternative are identical to those for Alternative C, except that the power transmission lines to the Delevan Pipeline Intake Pumping/Generating Plant have a different alignment; there are two recreation areas instead of three; and the Terminal Regulating Reservoir (TRR) is smaller. The operations are significantly different, with more Sites Reservoir Project water retained in the north and less exported south of the Delta.

Alternative D operations would deliver water for agricultural and M&I purposes (with approximately 36 percent of the water delivered for agricultural purposes in the Sacramento Valley, and the remainder exported), Delta Environmental and Export Water Quality, Anadromous Fish benefits, and IL4 Water Supply for CVPIA Refuges.

Alternative D would have a 1.8-MAF storage capacity. The larger reservoir would require more saddle dams than are needed for Alternative A, and the Sites Dam and Golden Gate Dam are larger than they are for Alternative A as well. Water would be diverted to fill the reservoir using the Tehama-Colusa Canal, GCID Main Canal, and the Delevan Pipeline. The Delevan Pipeline Intake Pumping/Generating Plant facilities would include a new screened intake capable of pumping up to 2,000 cfs from the Sacramento River and releasing up to 1,500 cfs back to the river. Transmission lines to the Delevan Pipeline Intake Pumping/Generating Plant would have a south-to-north alignment to bring power from the existing transmission lines near the city of Colusa.

**Ownership**

The Authority would own and operate Sites Reservoir, the TRR, the Delevan Pipeline, any forebay/afterbay facilities excluding Funks Reservoir, and the three new pumping/generating plants (Sites, TRR, and Delevan Intake).
Figure ES-2. Features of Sites Reservoir Project Initial Alternatives C and D
Physical Accomplishments of Initial Alternatives

The Sites Reservoir Project would offer several benefits to society and the environment. The proposed operations will provide more flexibility to the CVP and SWP in their operations. Table ES-1 is a summary of the accomplishments of the alternatives with the initially modeled operations.

Water Supply

All of the alternatives except for the No Project Alternative would meet the planning objective and improve water supply and water supply reliability. Sites Reservoir would provide a supplemental water supply for the agencies participating in the project. Alternative D provides the highest Average long-term annual delivery increases (255 thousand acre-feet [TAF]) and Dry and Critical year increases (418 TAF) due to a greater operational focus on water supply.

Deliveries are estimated at the point of use based on CALSIM modeling. Alternative C (similar facilities to Alternative D, but operated differently) would provide the second-highest overall water supply deliveries. Alternative A (smaller reservoir) and Alternative B (only two intakes) would provide less water for water supply purposes.

The four project alternatives would also improve storage (see Figure ES-3), both in Sites Reservoir and in existing CVP reservoirs, which would increase the operational flexibility of the system. Increased storage in existing CVP reservoirs would be operationally achieved by using water in Sites Reservoir to fulfill CVP obligations. This would increase the resilience of the CVP to drought and provide Central Valley Operation (CVO) with an increased ability to meet critical water supply and environmental needs. Water conserved in CVP reservoirs would improve the coldwater pool and serve a water-quality purpose (improving temperature) when released from CVP reservoirs. Through operational flexibility, Sites Reservoir would be functionally integrated with the CVP in that the water stored in and delivered from Sites Reservoir would be for CVP places of use and CVP obligations under Reclamation water rights and biological requirements.

Figure ES-3 shows the potential/estimated storage increases for the long-term Average and Critical (driest) periods in CVP reservoirs for the four project alternatives. This increase in storage at the Folsom, Oroville, and Shasta reservoirs would be achieved through in lieu deliveries from Sites Reservoir.

The additional storage (800 to 1,600 TAF) could significantly increase the ability to respond to system needs and provide for greater flexibility in system operations.

Figure ES-4 shows how the benefits would be delivered. Storage and deliveries for CVP Operational Flexibility would be provided from Sites Reservoir, and benefits (including south-of-Delta benefits) would be realized throughout the CVP system.

IL4 Water Supply to CVPIA Refuges

Water has been purchased (an average of approximately 50 TAF per year) and acquired through exchange to provide IL4 refuge water supplies for optimum habitat management at CVPIA refuges. As modeled, the project alternatives show a significant ability to provide water—ranging from a long-term average of 44 TAF under Alternative A to 74 TAF under Alternative C. The model assumed all water would be conveyed through the Banks Pumping Plant. The ability to provide IL4 refuge water supply is reduced in Dry and Critical years (22 to 37 TAF could be provided).
Table ES-1. Increased Long-Term and Dry/Critical Year Deliveries for Initial Alternatives

<table>
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<tr>
<th>Objectives and Accomplishments (above No Project Alternative conditions) a</th>
<th>Alternative A</th>
<th>Alternative B</th>
<th>Alternative C</th>
<th>Alternative D</th>
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<td><strong>Average</strong> <em>(TAF)</em></td>
<td>*<em>Dry and Critical</em> <em>(TAF)</em></td>
<td><strong>Average</strong> <em>(TAF)</em></td>
<td>*<em>Dry and Critical</em> <em>(TAF)</em></td>
<td><strong>Average</strong> <em>(TAF)</em></td>
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<td>1.8 MAF Reservoir No New Intake</td>
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<td>Export Focus</td>
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Notes: Totals may not sum exactly due to rounding

1. Dry years occur in 22% and Critical years in 15% of all years for a combined frequency of 39% of all years.
2. All deliveries are to point of use and exclude carriage water and conveyance losses (i.e., deliveries and not equal to releases from Sites Reservoir).
3. Increases in deliveries above the No Project Alternative, including supplies for agriculture, M&I, and environmental purposes. Dry and Critical period average is the average quantity for the combination of the SWRCB’s D-1641 40-30-30 Dry and Critical years for the period October 1921 to September 2003. The “Average (TAF)” is for this period.
4. Releases from Sites Reservoir to the Delta solely for environmental benefit. This quantity excludes any water released for export or carriage water requirements. No specific releases were dedicated to water quality improvements for M&I or agriculture.


Ag = agriculture
CVP = Central Valley Project
IL4 = Incremental Level 4
M&I = municipal and industrial
MAF = million acre-feet
NOD = north of the Delta
SOD = south of the Delta
SWP = State Water Project
SWRCB = State Water Resources Control Board
TAF = thousand acre-feet

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M&I = municipal and industrial
MAF = million acre-feet
NOD = north of the Delta
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SWRCB = State Water Resources Control Board
TAF = thousand acre-feet
Anadromous Fish
The Sites Reservoir Project provides additional flexibility to support CVP operations to deliver flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish, consistent with CVPIA Section 3406(b)(1)(B). The coldwater pool benefits described in this Feasibility Report for anadromous fish are contingent on conservation of water in CVP reservoirs for operational flexibility with late summer/fall delivery. All project alternatives would improve conditions that support population increases of anadromous fish, including endangered winter-run Chinook salmon. Figure ES-4 shows a conceptual model of the benefits from Sites Reservoir, including how the potential benefits to fish would be derived from Project operations.

Delta Environmental and Export Water Quality
Releases from Sites Reservoir (ranging from average releases of 174 to 243 TAF per year, depending on the alternative) could be used to augment flows through the Delta (see Table ES-1).

Sustainable Hydropower
Hydropower could be generated when water is released from Sites Reservoir or could be generated through pumpback operations. This energy recovery operation would offset the cost of pumping, and modeling results suggest that the revenues generated would be greater than the energy costs.

Recreation
New facilities would be developed on the shore of the Sites Reservoir to support recreational activities (e.g., camping, hiking, picnicking, and sightseeing).
Figure ES-4. Conceptual Model of Benefits
Flood Damage Reduction
Of the 22,200 acres of land prone to flooding in these watersheds, approximately 43 percent (9,570 acres) would experience a reduction in flood-related damages during a 100-year flood event. This area includes the northern portion of the town of Maxwell, Interstate Highway 5 (I-5), and the adjacent railroad (the primary rail line on the western side of the Sacramento River Valley).

Estimated Benefits and Costs for Initial Alternatives
Annualized benefits for each project alternative are summarized in Table ES-2. Alternative C has the highest National Economic Development (NED) benefits due to higher deliveries for water supply. The benefit-cost ratio (BCR) for Alternative C is estimated to be 1.13. Alternative A has the second-highest total NED benefits. The BCR for Alternative A is estimated at 1.11. Alternative D has the lowest total NED benefits and BCR. It should be noted that although Alternative C has the highest NED benefits, this is attributed to an operation with the highest deliveries of any alternative for Southern California urban water supply. The Authority has not been able to find investors in Southern California to subscribe for this magnitude of water supply.

Table ES-2. Summary of Estimated Annual NED Benefits for Sites Reservoir Project Initial Project Alternatives ($ million/yr, 2019)

<table>
<thead>
<tr>
<th>Beneficiary</th>
<th>Alternative A</th>
<th>Alternative B</th>
<th>Alternative C</th>
<th>Alternative D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply</td>
<td>$130.1</td>
<td>$125.3</td>
<td>$139.3</td>
<td>$129.2</td>
</tr>
<tr>
<td>Agricultural Supply ^a</td>
<td>$15.2</td>
<td>$8.6</td>
<td>$14.2</td>
<td>$22.7</td>
</tr>
<tr>
<td>M&amp;I Supply ^b</td>
<td>$114.9</td>
<td>$116.7</td>
<td>$125.0</td>
<td>$106.7</td>
</tr>
<tr>
<td>IL4 Water Supply to CVPIA Wildlife Refuges ^c</td>
<td>$25.3</td>
<td>$40.2</td>
<td>$42.3</td>
<td>$26.9</td>
</tr>
<tr>
<td>Anadromous Fish ^d</td>
<td>$45.8</td>
<td>$33.5</td>
<td>$37.0</td>
<td>$48.9</td>
</tr>
<tr>
<td>Delta Environmental and Export Water Quality ^e</td>
<td>$65.5</td>
<td>$70.5</td>
<td>$80.7</td>
<td>$45.3</td>
</tr>
<tr>
<td>Sustainable Hydropower Generation ^f</td>
<td>$20.3</td>
<td>$14.5</td>
<td>$23.5</td>
<td>$21.5</td>
</tr>
<tr>
<td>Recreation ^g</td>
<td>$2.4</td>
<td>$2.4</td>
<td>$2.5</td>
<td>$2.5</td>
</tr>
<tr>
<td>Flood Damage Reduction ^h</td>
<td>$4.6</td>
<td>$4.6</td>
<td>$4.6</td>
<td>$4.6</td>
</tr>
<tr>
<td>Total Annual Benefits</td>
<td>$294.1</td>
<td>$290.9</td>
<td>$330.0</td>
<td>$278.4</td>
</tr>
</tbody>
</table>

Note: Annual benefits shown in 2019 dollars based on 2.75% discount rate and a 100-year period of analysis. Totals may not sum exactly due to rounding.

^a Market-based estimates of cost for water transfers to NOD and SOD agricultural users
^b Market-based estimates of cost for water transfers to NOD and SOD municipal and industrial water agencies
^c Market-based estimates of cost for water transfers to NOD and SOD CVPIA refuges
^d Cost of Most Likely Alternative for environmental benefits from Shasta Lake Water Resources Investigation
^e Change in net income valuation of water deliveries for environmental, agricultural and M&I water quality improvements.
^f Market-based estimates of power cost and revenues from pumpback hydropower operations
^g Visitation day-based estimates using recreation data and Rosenberger 2016 unit day values for recreation
^h Market-based estimates of avoided annual expected damages from flooding

$ million/yr = million dollars per year
CVPIA = Central Valley Project Improvement Act
IL4 = Incremental Level 4
M&I = municipal and industrial
NED = National Economic Development
NOD = North-of-the-Delta
SOD = South-of-the-Delta
Potential Environmental Effects of Initial Alternatives

The Draft EIR/EIS describes the environmental setting; identifies the potential direct, indirect, and cumulative impacts that could result from implementation of each of the proposed project alternatives; and proposes mitigation measures for impacts found to be significant. Twenty-one resource areas were evaluated in the report. Significant and unavoidable impacts were identified for seven resource areas (terrestrial biological resources, aquatic biological resources, paleontological resources, historical and tribal resources, land use, air quality, and climate change/greenhouse gas emissions). Twenty-five Federally listed and State-listed species were identified in the Primary Study Area. The Record of Decision for the Sites Reservoir Project will not be completed until after the receipt of all permits and the publication of the Final EIR/EIS.

Final Alternatives

Following the review of the initial alternatives, the operations of the alternatives were further refined to capture the evolving nature of the NODOS Project. The project objectives that were initially developed were modified for consistency with the Water Storage Investment Program (WSIP) findings by the State. A Delta Ecosystem Enhancement objective was added to the project. No WSIP funds were awarded by the State for the water quality objective, making it difficult to assign the costs. There was also a concern regarding whether the modeled operations in the Delta during the WSIP process would be realized. As a result, the water quality objective was removed.

Furthermore, with the adoption of the amended Coordinated Operation Agreement (COA) and the 2019 Biological Opinions (BiOps), the operational and regulatory environment changed significantly during the course of this evaluation. These new regulatory requirements were incorporated into the model for refined alternatives.

In addition, a decision was made to evaluate CVP Operational Flexibility as a project objective, consistent with all ongoing surface storage studies underway within Reclamation. Furthermore, the costs of pumpback storage were high compared to the benefits generated. Pumpback facilities were removed from the refined alternatives (this modification to the alternatives should be reassessed if the energy market changes).

Due to the extent of changes subsequent to the initial alternatives evaluation, it was deemed necessary to refine the alternatives and model with the refinements to assess the benefits for Alternatives A1 and D1. These alternatives have the same facilities, except for pumpback capability, as Alternatives A and D, respectively, but the operations have been altered to incorporate the refined project objectives. This analysis also provided an opportunity to incorporate the updated COA and 2019 BiOps into the model.

CVP Operational Flexibility would enhance the CVP’s ability to meet CVP demands in an ever-changing environment. CVP Operational Flexibility under the WIIN Act is defined as the benefit accruing to the Federal Government from an increased ability to allocate additional water supplies through an investment by the United States in a water supply project. The investment would enable the Federal Government to deliver benefits and better meet project purposes by increasing the efficiency, reuse, or multiple use of existing supplies or by reducing the impacts of regulatory or capacity constraints on an existing Reclamation project. This would include providing environmental benefits to anadromous fish, refuges, and water quality, as well as restoration of CVP deliveries that
have been lost due to regulatory changes. Water from the CVP Operational Flexibility purpose would be allocated by Reclamation to any of Reclamation’s authorized purposes based on need and the operational ability to fulfill that need.

Reclamation’s CVO office would determine how water gained through CVP Operational Flexibility is used to meet CVP purposes. For the Sites Reservoir Project, in lieu releases of water from Sites Reservoir will enable the conservation of water stored in CVP reservoirs (i.e., Shasta and Folsom reservoirs). This water can then be used at a later time for a variety of purposes; in many instances, it may serve multiple purposes as it flows downstream. Purposes include the following:

- Restoring CVP yield
- Enhancing flows to improve habitat conditions and in-river rearing for juvenile salmonids
- Maintaining flows and ramping rates to minimize dewatering of redds and prevent stranding of juveniles
- Increasing attraction flows during upstream migration to reduce straying
- Maintaining groundwater and surface water interconnections to support groundwater-dependent ecosystems
- Enhancing flow to improve the quantity and quality of riparian and floodplain habitats
- Providing water for seasonal wetlands (e.g., inundated rice fields for migrating waterfowl north of the Delta) for the benefit of wildlife
- Enhancing access to fish spawning, rearing, and holding habitat (e.g., improving access to habitat in the bypasses)

Water delivered for the CVP Operational Flexibility purpose may be used downstream or for any CVP purpose.

Through CVP operational flexibility simulated in refined alternatives, dedicated CVP storage in Sites Reservoir would be functionally integrated with the CVP in that the water stored in and delivered from Sites Reservoir would be for CVP places of use and CVP obligations under Reclamation water rights and biological requirements.

The deliveries and other performance metrics for the refined alternatives are summarized in Table ES-1.

The refined Project objectives and operations have been better vetted through the WSIP process and with the Authority’s investors. Refined alternative modeling also incorporates the updated COA and 2019 BiOps to better reflect current conditions. Alternative A1 has slightly higher net NED benefits and is the NED Plan. It also has a slightly higher BCR. The BCR for Alternative A1 is 1.07, and the BCR for Alternative D1 is 1.06.
Table ES-3 is a summary of the NED benefits estimated from the sensitivity modeling effort.

Table ES-3. Summary of Estimated Annual NED Benefits for Sites Reservoir Project Final Alternatives
($ million/yr, 2018)

<table>
<thead>
<tr>
<th>Beneficiary</th>
<th>Alternative A1</th>
<th>Alternative D1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply</td>
<td>$138.6</td>
<td>$161.7</td>
</tr>
<tr>
<td>Agricultural Supply (^a)</td>
<td>$15.4</td>
<td>$16.2</td>
</tr>
<tr>
<td>M&amp;I Supply (^b)</td>
<td>$123.2</td>
<td>$145.4</td>
</tr>
<tr>
<td>CVP Operational Flexibility (^c)</td>
<td>$47.1</td>
<td>$48.4</td>
</tr>
<tr>
<td>IL4 Water Supply for CVPIA Refuges (^d)</td>
<td>$19.6</td>
<td>$20.7</td>
</tr>
<tr>
<td>Anadromous Fish (^e)</td>
<td>$14.4</td>
<td>$18.0</td>
</tr>
<tr>
<td>Delta Ecosystem Enhancement (^f)</td>
<td>$16.7</td>
<td>$14.5</td>
</tr>
<tr>
<td>Recreation (^g)</td>
<td>$2.4</td>
<td>$2.5</td>
</tr>
<tr>
<td>Flood Damage Reduction (^h)</td>
<td>$4.6</td>
<td>$4.6</td>
</tr>
<tr>
<td><strong>Total Annual Benefits</strong></td>
<td><strong>$243.5</strong></td>
<td><strong>$270.4</strong></td>
</tr>
</tbody>
</table>

Notes: Annual benefits shown in 2019 dollars based on 2.75% discount rate and a 100-year period of analysis. Totals may not sum exactly due to rounding.

\(^a\) Combined market-based and change in net income valuations of water transfers/deliveries to NOD and SOD agricultural users

\(^b\) Change in net income valuation of deliveries to SOD municipal and industrial water agencies

\(^c\) Combined market-based and change in net income valuations of water transfers/deliveries to NOD and SOD CVP agricultural users and change in net income valuation of deliveries to NOD and SOD municipal and industrial water agencies

\(^d\) Combined market-based and change in net income valuations of water transfers/deliveries to NOD and SOD CVPIA refuge.

\(^e\) Cost of Most Likely Alternative for environmental benefits from Shasta Lake Water Resources Investigation

\(^f\) Combined market-based and change in net income valuations of NOD water transfers/deliveries to the Yolo Bypass

\(^g\) Visitation day-based estimates using recreation data and Rosenberger 2016 unit day values for recreation

\(^h\) Market-based estimates of avoided annual expected damages from flooding

\(\$ \text{ million/yr} = \text{million dollars per year}\)

\(\text{CVP} = \text{Central Valley Project}\)

\(\text{CVPIA} = \text{Central Valley Project Improvement Act}\)

\(\text{IL4} = \text{Incremental Level 4}\)

\(\text{M&I} = \text{municipal and industrial}\)

\(\text{NED} = \text{National Economic Development}\)

Table ES-4 is a summary of the Project costs.

Table ES-4. Summary of Final Alternative Costs (cost in $ millions)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alternative A1</th>
<th>Alternative D1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Cost to Midpoint of Construction</td>
<td>$5,792</td>
<td>$6,552</td>
</tr>
<tr>
<td>Total Capital Cost (^1)</td>
<td>$6,510</td>
<td>$7,365</td>
</tr>
<tr>
<td>Annual OM&amp;R Cost (^2)</td>
<td>$41.4</td>
<td>$44.3</td>
</tr>
<tr>
<td>Annual Cost (^2)</td>
<td>$228</td>
<td>$255</td>
</tr>
</tbody>
</table>

\(^1\) Total capital cost shown for April 2019 price level

\(^2\) Includes both capital amortization and annual OM&R costs

\(\$ \text{ millions} = \text{millions of dollars}\)

\(\text{OM&R} = \text{operation, maintenance, and replacement}\)
Project Feasibility

Technical Feasibility
Alternatives A1 and D1 are constructible, and can be operated and maintained.

A Design, Estimate, and Constructability Cost (DEC) review evaluated the engineering and costs basis for this report in April 2020. The review found that the risks and uncertainties associated with the NODOS Project have been mitigated to reflect a feasibility level for designs and cost estimates.

Future work is planned for pre-construction to further reduce risk and uncertainty. The work includes further geotechnical investigation, engineering design, water rights, permitting of diversions, and operations.

Environmental Feasibility
The Draft EIR/EIS evaluated the potential direct, indirect, and cumulative impacts that could result from implementation of each of the proposed project alternatives, and proposes mitigation measures for impacts found to be significant. Twenty-one resource areas were evaluated in the report. Significant and unavoidable impacts were identified for seven resource areas (terrestrial biological resources, aquatic biological resources, palaeontological resources, historical and tribal resources, land use, air quality, and climate change/greenhouse gas emissions). The environmental feasibility of implementing the project alternatives is evaluated in the Draft EIR/EIS, which is incorporated into this document by reference. Implementation of the NED Plan (Alternative A1) is considered environmentally feasible, pending the completion of the Final EIR/EIS.

Economic Feasibility
The relative accomplishments of Alternatives A1 and D1 are summarized in Table ES-5 and the benefits are summarized in Table ES-3. The economic feasibility is evaluated to confirm that constructing and operating the project would result in positive net NED benefits. Alternative A1 provides the greatest net NED benefits, and was identified as the NED Plan. Alternatives A1 and D1 are economically feasible. Alternative A1 would generate $15.5 million in net NED benefits per year.

Alternate valuation methods and sensitivity analyses (provided in Appendix C – Economic Analysis) demonstrate that, overall, the estimated economic benefits values and assumptions are reasonable.

Financial Feasibility
Financial feasibility determination during the planning stage consists of (1) allocating costs to project purposes, (2) assigning Federal and non-Federal costs for each identified project purpose, (3) identifying potential project beneficiaries, and (4) determining project beneficiaries’ potential ability to pay their allocated and assigned costs, including capital and long-term operations, maintenance, and replacement costs.

Table ES-6, Table ES-7, and Table ES-8 summarize the allocation and assignment of the Alternative A1 construction cost (construction and Interest During Construction [IDC]) and operation, maintenance, and replacement (OM&R) costs to the Federal Government and the non-Federal partners. Table ES-9, Table ES-10, and Table ES-11 provide similar information for Alternative D1.
Table ES-5. Summary of Relative Accomplishments of Final Alternatives  
(Refined Alternative Analysis with Updated COA and 2019 BiOps)

<table>
<thead>
<tr>
<th>Purposes and Accomplishments (above No Project Alternative Conditions)</th>
<th>Alternative A1 1.3 MAF New Intake</th>
<th>Alternative D1 1.8 MAF New Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Dry and Critical</td>
<td>Average Dry and Critical</td>
</tr>
<tr>
<td>Deliveries for CVP Operational Flexibility (TAF)</td>
<td>69 87 73 114</td>
<td></td>
</tr>
<tr>
<td>Deliveries for Water Supply (M&amp;I and agricultural purposes) (TAF) (^a)</td>
<td>116 248 131 289</td>
<td></td>
</tr>
<tr>
<td>Deliveries for IL4 Water Supply to CVPIA Refuges (TAF)</td>
<td>32 44 34 48</td>
<td></td>
</tr>
<tr>
<td>Deliveries for Delta Ecosystem Enhancement (TAF)</td>
<td>57 44 51 33</td>
<td></td>
</tr>
<tr>
<td>Total (TAF)</td>
<td>274 423 289 484</td>
<td></td>
</tr>
<tr>
<td>Shasta Coldwater Pool – Average end-of-September in TAF</td>
<td>138 164</td>
<td></td>
</tr>
<tr>
<td>Anadromous Fish – Chinook Fish Production (Habitat Units from SALMOD Model)(^b)</td>
<td>214 268</td>
<td></td>
</tr>
<tr>
<td>Sacramento River Critical year Temperature Improvement at Keswick (°F)</td>
<td>-1.3 -1.7</td>
<td></td>
</tr>
<tr>
<td>Number of Recreation Sites</td>
<td>2 2</td>
<td></td>
</tr>
<tr>
<td>Flood Damage Reduction (acres)</td>
<td>9,570 9,570</td>
<td></td>
</tr>
<tr>
<td>Long-Term Direct and Indirect Jobs Created</td>
<td>49 56</td>
<td></td>
</tr>
<tr>
<td>Short-Term Direct, Indirect, and Induced Jobs Created</td>
<td>453 496</td>
<td></td>
</tr>
<tr>
<td>Construction Cost to Midpoint of Construction ($ millions)</td>
<td>$5,792 $6,552</td>
<td></td>
</tr>
<tr>
<td>Total Capital Cost ($ millions)(^c)</td>
<td>$6,510 $7,365</td>
<td></td>
</tr>
<tr>
<td>Annual OM&amp;R ($ million/yr)</td>
<td>$41.4 $44.3</td>
<td></td>
</tr>
<tr>
<td>Annual Cost ($ million/yr)(^d)</td>
<td>$228 $255</td>
<td></td>
</tr>
<tr>
<td>Annual NED Benefits ($ million/yr)</td>
<td>$243 $270</td>
<td></td>
</tr>
<tr>
<td>Net Annual NED Benefits ($ million/yr)</td>
<td>$15.5 $15.0</td>
<td></td>
</tr>
<tr>
<td>BCR</td>
<td>1.07 1.06</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

\(^a\) Water supply increases above the No Project Alternative, including supplies for agriculture and M&I. Deliveries are estimated at the point of use. Dry and Critical period average is the average quantity for the combination of the SWRCB D-1641 40-30-30 Dry and Critical years for the period of October 1921 through September 2003. Average annual is for the period of October 1921 through September 2003.

\(^b\) Increase in production (SALMOD model) when compared to the No Project Alternative.

\(^c\) Total capital cost shown for April 2019 price level

\(^d\) Including both capital amortization and OM&R costs

\(^\circ\)F = degrees Fahrenheit

$ millions = millions of dollars

$ million/yr = million dollars per year

BCR = benefit-cost ratio

BiOps = biological opinions

COA = Coordinated Operation Agreement

CVP = Central Valley Project

CVPIA = Central Valley Project Improvement Act

D-1641 = Water Rights Decision 1641 Revised (SWRCB 2000)

IL4 = Incremental Level 4

M&I = municipal and industrial

MAF = million acre-feet

NED = National Economic Development

OM&R = operation, maintenance, and replacement

SALMOD = a computer model that simulates the dynamics of freshwater salmonid populations

SWRCB = State Water Resources Control Board

TAF = thousand acre-feet
### Table ES-6. Summary of Initial Cost Allocation by Project Purpose for Alternative A1

<table>
<thead>
<tr>
<th>Purpose/Project</th>
<th>Total Cost</th>
<th>Federal</th>
<th>Non-Federal Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadromous Fish</td>
<td>$3,238</td>
<td>55.9%</td>
<td>20.0%</td>
</tr>
<tr>
<td>CVP Operational Flexibility</td>
<td>$1,156</td>
<td>8.3%</td>
<td>100%</td>
</tr>
<tr>
<td>Water Supply</td>
<td>$483</td>
<td>6.3%</td>
<td>$290 20.0%</td>
</tr>
<tr>
<td>Delta Ecosystem Enhancement</td>
<td>$363</td>
<td>7.3%</td>
<td>$64 1.1%</td>
</tr>
<tr>
<td>Recreation</td>
<td>$421</td>
<td>1.1%</td>
<td>$71 1.2%</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>$64</td>
<td>1.1%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>$5,794</td>
<td>100%</td>
<td>$1,446 25.0%</td>
</tr>
</tbody>
</table>

Note:
General: April 2019 price levels. Annualized construction costs shown in 2019 dollars based on 2.75% discount rate and a 100-year period of analysis. Totals may not sum exactly due to rounding.

$ million/yr = million dollars per year
CVP = Central Valley Project
CVPIA = Central Valley Project Improvement Act
IL4 = Incremental Level 4
OM&R = operation, maintenance, and replacement

### Table ES-7. Construction Cost Assignment: Alternative A1

<table>
<thead>
<tr>
<th>Purpose/Project</th>
<th>Total Cost</th>
<th>Federal</th>
<th>Non-Federal Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadromous Fish</td>
<td>$363</td>
<td>80.0%</td>
<td>$290 20.0%</td>
</tr>
<tr>
<td>CVP Operational Flexibility</td>
<td>$1,156</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Water Supply</td>
<td>$3,238</td>
<td>100%</td>
<td>$3,238</td>
</tr>
<tr>
<td>M&amp;I Water Supply</td>
<td>$2,878</td>
<td>100%</td>
<td>$2,878</td>
</tr>
<tr>
<td>Agricultural Water Supply</td>
<td>$360</td>
<td>100%</td>
<td>$360</td>
</tr>
<tr>
<td>Delta Ecosystem Enhancement</td>
<td>$421</td>
<td>100%</td>
<td>$421</td>
</tr>
<tr>
<td>IL4 Water Supply for CVPIA Refuges</td>
<td>$483</td>
<td>100%</td>
<td>$483</td>
</tr>
<tr>
<td>Recreation</td>
<td>$64</td>
<td>100%</td>
<td>$64</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>$71</td>
<td>100%</td>
<td>$71</td>
</tr>
<tr>
<td>Total</td>
<td>$5,794</td>
<td>25.0%</td>
<td>$1,446 75.0%</td>
</tr>
</tbody>
</table>

Note:
*a Includes State and Authority members’ paid funding.

Sub-allocations between M&I and agricultural use are based on relative benefits. Totals may not sum exactly due to rounding.

$ millions = millions of dollars
CVP = Central Valley Project
CVPIA = Central Valley Project Improvement Act
IDC = interest during construction
IL4 = Incremental Level 4
M&I = municipal and industrial

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North-of-the-Delta Offstream Storage Investigation Feasibility Report
Executive Summary
Final Feasibility Report
December 2020 – ES-22
### Table ES-8. Annual OM&R Cost Assignment: Alternative A1

<table>
<thead>
<tr>
<th>Purpose/Project</th>
<th>Total Annual Percent</th>
<th>Total Annual Cost</th>
<th>Cost Assignment ($ millions per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Federal</td>
<td>Non-Federal Partners&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>Cost</td>
<td>Percent</td>
</tr>
<tr>
<td>Anadromous Fish</td>
<td>4.5%</td>
<td>$1.9</td>
<td>100%</td>
</tr>
<tr>
<td>CVP Operational Flexibility</td>
<td>17.3%</td>
<td>$7.1</td>
<td>100%</td>
</tr>
<tr>
<td>Water Supply</td>
<td>64.3%</td>
<td>$26.6</td>
<td>100%</td>
</tr>
<tr>
<td>M&amp;I Water Supply</td>
<td>92.2%</td>
<td>$24.5</td>
<td>100%</td>
</tr>
<tr>
<td>Agricultural Water Supply</td>
<td>7.8%</td>
<td>$2.1</td>
<td>100%</td>
</tr>
<tr>
<td>Delta Ecosystem Enhancement</td>
<td>5.2%</td>
<td>$2.2</td>
<td>100%</td>
</tr>
<tr>
<td>IL4 Water Supply for CVPIA Refuges</td>
<td>6.9%</td>
<td>$2.9</td>
<td>99.9%</td>
</tr>
<tr>
<td>Joint</td>
<td></td>
<td>2.5</td>
<td>100%</td>
</tr>
<tr>
<td>Separable</td>
<td></td>
<td>$0.4</td>
<td>75%</td>
</tr>
<tr>
<td>Recreation</td>
<td>0.9%</td>
<td>$0.4</td>
<td>100%</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>0.9%</td>
<td>$0.4</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>$41.4</td>
<td>18.0%</td>
</tr>
</tbody>
</table>

Notes:

<sup>a</sup> Includes State and Authority members’ paid funding.

<sup>b</sup> OM&R costs associated with IL4 refuge water supplies can be broken down into two categories: (1) the cost of filling the reservoir, which is a joint cost that will be paid for by the Non-Federal partners, and (2) the cost of delivering water from the Delevan Pipeline Discharge to the Refuge, which a separable cost that is subject to the cost-share requirements of CVPIA. The annual OM&R cost for IL4 refuge water supply has two distinct components:

1. The cost to divert water to fill the reservoir and other reservoir O&M costs ($2.5 million for Alt A1)
2. The cost to deliver water from the reservoir (end of the Delevan Pipeline) to the refuge boundary ($0.4 million for Alt A1)

The first component is treated as a joint cost and allocated 100% to the JPA. The second component is a separable conveyance cost and subject to the 75/25 cost share requirement under CVPIA. Therefore, $0.3 million is allocated to the Federal government and $0.1 million is allocated to the non-Federal partners. The Federal government is allocated approximately 9.9% ($0.3 million) of the $2.9 million in total annual OM&R costs allocated to IL4 refuge water supply.

Sub-allocations between M&I and agricultural use are based on relative benefits and water delivery quantities. Totals may not sum exactly due to rounding.

CVP = Central Valley Project
CVPIA = Central Valley Project Improvement Act
IL4 = Incremental Level 4
M&I = municipal and industrial
OM&R = operation, maintenance, and replacement

### Table ES-9. Summary of Initial Cost Allocation by Project Purpose for Alternative D1

<table>
<thead>
<tr>
<th>Purpose/Project</th>
<th>Water Supply ($ million/yr)</th>
<th>CVP Operational Flexibility</th>
<th>Anadromous Fish</th>
<th>IL4 Water Supply to CVPIA Refuges</th>
<th>Delta Ecosystem Enhancement</th>
<th>Recreation</th>
<th>Flood Damage Reduction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Construction Costs</td>
<td>$3,752</td>
<td>$1,258</td>
<td>$538</td>
<td>$479</td>
<td>$385</td>
<td>$68</td>
<td>$75</td>
<td>$6,564</td>
</tr>
<tr>
<td>(% of total)</td>
<td>57.2%</td>
<td>19.2%</td>
<td>8.2%</td>
<td>7.3%</td>
<td>5.9%</td>
<td>1.0%</td>
<td>1.1%</td>
<td>100%</td>
</tr>
<tr>
<td>Total Annual OM&amp;R Costs</td>
<td>$29.7</td>
<td>$6.9</td>
<td>$2.9</td>
<td>$2.2</td>
<td>$1.8</td>
<td>$0.4</td>
<td>$0.4</td>
<td>$44.3</td>
</tr>
<tr>
<td>(% of total)</td>
<td>67.0%</td>
<td>15.6%</td>
<td>6.6%</td>
<td>5.1%</td>
<td>4.1%</td>
<td>0.9%</td>
<td>0.8%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note:

General: April 2019 price levels. Annualized construction costs shown in 2019 dollars based on 2.75% discount rate and a 100-year period of analysis. Totals may not sum exactly due to rounding.

$ million/yr = million dollars per year
CVP = Central Valley Project
CVPIA = Central Valley Project Improvement Act
IL4 = Incremental Level 4
OM&R = operation, maintenance, and replacement
Table ES-10. Construction Cost Assignment: Alternative D1

<table>
<thead>
<tr>
<th>Purpose/Project</th>
<th>Total Percent</th>
<th>Total Cost</th>
<th>Cost Assignment ($ millions)</th>
<th>Federal</th>
<th>Non-Federal Partners¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Percent</td>
<td>Cost</td>
<td>Percent</td>
</tr>
<tr>
<td>Alternative D1: Construction Cost Assignment – Nominal Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anadromous Fish</td>
<td>7.3%</td>
<td>$479</td>
<td>80.0%</td>
<td>$383</td>
<td>20.0%</td>
</tr>
<tr>
<td>CVP Operational Flexibility</td>
<td>19.2%</td>
<td>$1,258</td>
<td>100%</td>
<td>$1,258</td>
<td></td>
</tr>
<tr>
<td>Water Supply</td>
<td>57.2%</td>
<td>$3,752</td>
<td>100%</td>
<td>$3,752</td>
<td></td>
</tr>
<tr>
<td>M&amp;I Water Supply</td>
<td>90.0%</td>
<td>$3,375</td>
<td>100%</td>
<td>$3,375</td>
<td></td>
</tr>
<tr>
<td>Agricultural Water Supply</td>
<td>10.0%</td>
<td>$376</td>
<td>100%</td>
<td>$376</td>
<td></td>
</tr>
<tr>
<td>Delta Ecosystem Enhancement</td>
<td>5.9%</td>
<td>$385</td>
<td>100%</td>
<td>$385</td>
<td></td>
</tr>
<tr>
<td>IL4 Water Supply for CVPIA Refuges</td>
<td>8.2%</td>
<td>$538</td>
<td>100%</td>
<td>$538</td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td>1.0%</td>
<td>$68</td>
<td>100%</td>
<td>$68</td>
<td></td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>1.1%</td>
<td>$75</td>
<td>100%</td>
<td>$75</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>$6,554</td>
<td>25.0%</td>
<td>$1,641</td>
<td>75.0%</td>
</tr>
</tbody>
</table>

¹ Includes State and Authority members’ paid funding.

Sub-allocations between M&I and agricultural use are based on relative benefits. Totals may not sum exactly due to rounding.

$ millions = millions of dollars
IDC = interest during construction
CVP = Central Valley Project
IL4 = Incremental Level 4
CVPIA = Central Valley Project Improvement Act
M&I = municipal and industrial

Table ES-11. Annual OM&R Cost Assignment: Alternative D1

<table>
<thead>
<tr>
<th>Purpose/Project</th>
<th>Total Annual Percent</th>
<th>Total Annual Cost</th>
<th>Cost Assignment ($ millions per year)</th>
<th>Federal</th>
<th>Non-Federal Partners¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Percent</td>
<td>Cost</td>
<td>Percent</td>
</tr>
<tr>
<td>Alternative D1: OM&amp;R Cost Assignment – Annual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coldwater for Anadromous Fish</td>
<td>5.1%</td>
<td>$2.2</td>
<td>100%</td>
<td>$2.2</td>
<td></td>
</tr>
<tr>
<td>CVP Operational Flexibility</td>
<td>15.6%</td>
<td>$6.9</td>
<td>100%</td>
<td>$6.9</td>
<td></td>
</tr>
<tr>
<td>Water Supply</td>
<td>67.0%</td>
<td>$29.7</td>
<td>100%</td>
<td>$29.7</td>
<td></td>
</tr>
<tr>
<td>M&amp;I Water Supply</td>
<td>93.2%</td>
<td>$27.7</td>
<td>100%</td>
<td>$27.7</td>
<td></td>
</tr>
<tr>
<td>Agricultural Water Supply</td>
<td>6.8%</td>
<td>$2.0</td>
<td>100%</td>
<td>$2.0</td>
<td></td>
</tr>
<tr>
<td>Delta Ecosystem Enhancement</td>
<td>4.1%</td>
<td>$1.8</td>
<td>100%</td>
<td>$1.8</td>
<td></td>
</tr>
<tr>
<td>IL4 Water Supply for CVPIA Refuges b</td>
<td>6.4%</td>
<td>$2.9</td>
<td>10.3%</td>
<td>$0.3</td>
<td>89.7%</td>
</tr>
<tr>
<td>Joint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td>0.9%</td>
<td>$0.4</td>
<td>75%</td>
<td>$0.3</td>
<td>25%</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>0.8%</td>
<td>$0.3</td>
<td>100%</td>
<td>$0.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>$44.3</td>
<td>16.2%</td>
<td>$7.2</td>
<td>83.8%</td>
</tr>
</tbody>
</table>

¹ Includes State and Authority members’ paid funding.

b OM&R costs associated with IL4 refuge water supplies can be broken down into two categories: (1) the cost of filling the reservoir, which is a joint cost that will be paid for by the Non-Federal partners, and (2) the cost of delivering water from the Delevan Pipeline Discharge to the Refuge, which a separable cost that is subject to the cost-share requirements of CVPIA. The annual OM&R cost for IL4 refuge water supply has two distinct components:

1. The cost to divert water to fill the reservoir and other reservoir O&M costs ($2.5 million for Alt D1)
2. The cost to deliver water from the reservoir (end of the Delevan Pipeline) to the refuge boundary ($0.4 million for Alt D1)

The first component is treated as a joint cost and allocated 100% to the JPA. The second component is a separable conveyance cost and subject to the 75/25 cost share requirement under CVPIA. Therefore, $0.3 million is allocated to the Federal government and $0.1 million is allocated to the non-Federal partners. The Federal government is allocated approximately 10.3% ($0.3 million) of the $2.9 million in total annual OM&R costs allocated to IL4 refuge water supply.

Sub-allocations between M&I and agricultural use are based on relative benefits and water delivery quantities. Totals may not sum exactly due to rounding.

CVP = Central Valley Project
CVPIA = Central Valley Project Improvement Act
IDC = interest during construction
OM&R = operation, maintenance, and replacement

$ millions = millions of dollars
IDC = interest during construction
CVP = Central Valley Project
IL4 = Incremental Level 4
CVPIA = Central Valley Project Improvement Act
M&I = municipal and industrial
OM&R = operation, maintenance, and replacement
The Federal Government is assigned the full construction cost for CVP Operational Flexibility purposes and the partial construction cost for Anadromous Fish. Federal funds are requested under the WIIN Act. No aid-to-irrigation is allowed for construction costs of CVP Operational Flexibility, and where ability to pay analysis determines the payment capacity is insufficient, the water will not go to that purpose. All other construction costs would be paid by the non-Federal partners.

All OM&R costs under the CVP Operational Flexibility project purpose would be assigned to beneficiaries, as determined in the financial plans for these supplies. OM&R costs associated with deliveries for agricultural and M&I supply will be addressed using the existing rate-setting policies and cost pools, and will be recovered through the existing rate-setting process. Non-Federal costs for OM&R will be funded by the non-Federal partners.

Reclamation will receive IL4 Water Supplies for CVPIA Refuges at no cost. The Project’s non-Federal partners will pay 100 percent of the IL4 Water Supply for CVPIA Refuges purpose’s OM&R expenses that are not attributable to conveyance (i.e., diversions and filling). Under the planned assignment of costs, the cost to convey IL4 Water Supply for CVPIA Refuges from the Delevan pipeline discharge to the refuges would be consistent with CVPIA cost-share requirements (75 percent Federal and 25 percent State). These costs would vary by year, depending on hydrology and the amount of water delivered from the Project.

All other future OM&R costs associated with other project purposes will be paid by the non-Federal partners. Federal funding under the WIIN Act or State funding under Proposition 1 and the WSIP is not subject to any cost sharing under the CVPIA. The Authority will need to enter into an agreement that makes water available each year to the RWSP at no cost (i.e., the water is a donation), consistent with the IL4 Water Supply for CVPIA Refuges benefits analyzed in this Feasibility Report.

The Federal share of the total cost for Alternative A1 or Alternative D1 is 25 percent, consistent with the WIIN Act’s maximum funding limit of 25 percent of the total cost of a State-led project (Section 4007(c)(1) of the WIIN Act).

**Risk and Uncertainty**

Implementation risks and uncertainties include the following:

- **Project Implementation** – The lead agencies would need to determine the Project’s implementation strategy prior to developing the applications for permits and before beginning Project construction. Implementation of the Project may be phased to meet the current needs of the participating agencies who are investing in the Project; however, there is no phased implementation plan at this time. This may initially alter the magnitude of the benefits and effects of the Project. In general, if the Project were to be constructed in phases, the initial benefits would be realized over time. This Feasibility Report does not consider the benefits and costs associated with potential phases of implementation.

- **Future Water System Operations** – There is a risk that future conditions, including the regulatory environment, could reduce the allowable diversions into Sites Reservoir, thereby reducing the benefits.

- **IL4 Water Supply for CVPIA Refuges** – Real-time operations may vary from the modeled performance due to prioritization and availability. To address this uncertainty, operations
were modeled using both SWP and CVP pumping to convey water to south-of-Delta refuges. Pumping was not restricted in the model to the transfer window. Export for IL4 refuge supply will be limited to times when there is no negative impact to SWP or CVP deliveries.

- **Hydropower Operations** – Additional work is underway to better define the integration of the Sites Reservoir Project with the power grid, including the possible identification of partnering power utilities and the nature of their participation in the Project. Pumpback generation has been removed from Alternatives A1 and D1 due to the high cost and relatively low benefit from pumpback power; however, this is very sensitive to the energy market and may be reconsidered in the future.

- **Cost Estimates** – Varying uncertainties are associated with the material and unit costs used to develop the estimates.

- **Water Supply Reliability and Demands** – Water supplies and demands will continue to vary into the future.

- **Energy Costs for Conveyance** – There is high volatility in wholesale energy markets, especially price risk and uncertainty in the underlying fuel markets.

- **Impacts to CVP Power** – There are potential impacts to CVP power users from changes in the timing of releases from Shasta Dam and the use of the Red Bluff Pumping Plant for diversions. Additional impacts would result if the Jones Pumping Plant were used for deliveries south of the Delta. These impacts are being further characterized.

**Summary of the NED Plan**

The NED Plan (Alternative A1) would include the construction of Sites Reservoir with a capacity of 1.8 MAF. The reservoir would be filled using a new intake on the Sacramento River (Delevan Intake) in addition to using two existing canals (Tehama-Colusa and Glen Colusa Irrigation District Main Canals).

The reservoir would be filled with diversions during periods of high flows in the Sacramento River. Diversions would be made from the Sacramento River at the Red Bluff, Hamilton City, and new Delevan Intake pumping facilities. Water would be stored in Sites Reservoir until released for use in drier conditions. Releases would be directed to the southern portions of the Tehama-Colusa or Glenn Colusa Irrigation District Main Canals, or released through the Delevan Pipeline back to the Sacramento River for downstream use.

All project alternatives were developed to improve the operational flexibility and reliability of the California water system (CVP, SWP, and systems operated by local water agencies). Sites Reservoir would be cooperatively operated with Shasta Lake to conserve the cold water stored in Shasta Lake throughout the summer and to support appropriate water temperatures in the Sacramento River.

Water released from Sites Reservoir would meet Reclamation’s environmental obligations and a portion of the CVP contract obligations in lieu of releases from Shasta Lake (CVP water deliveries would be made to CVP contractors downstream of Sites Reservoir in accordance with their existing CVP contracts). Similar benefits could be achieved through cooperative operations with Folsom
Lake (and Lake Oroville in the SWP). The cooperative operations would be implemented through the coordination of water rights and contractual foundations in partnership with the Authority, Reclamation, and DWR.

The Recommended Plan would provide increased water supplies to M&I users, agricultural users, and to Refuges; and would improve CVP operational flexibility and enhance the Delta ecosystem. Water supplies provided would vary by year type.

- **Irrigation and M&I supplies** provided to Local Agency Partners are estimated to be about 131 TAF/year (long-term average).
- **Refuge water supplies** are estimated to be about 34 TAF/year (long-term average).
- **CVP operational flexibility** would increase by 73 TAF/year (long-term average).
- **Delta ecosystem enhancement** would be achieved through the delivery of 51 TAF/year (long-term average) through the toe drain of the Yolo Bypass to reduce food scarcity for Delta smelt.
- **Anadromous fish** would benefit from colder temperatures in the Sacramento River.
- **Flood damage reduction and Recreation** would be provided with the construction of new project facilities.

The estimated total annual monetary benefit is about $278.4 million. The annual net economic benefit is to be about $23 million per year. The overall B/C ratio is 1.09.

The Recommended Plan is determined to be technically, environmentally, economically, and financially feasible.

**Recommendations**

As the NED Plan (Alternative A1) is being reviewed for approval, the NODOS Investigation recommends the following actions.

Recommendations for the Secretary of the Interior:

- Determine that the Project is feasible. There are Federal benefits, as framed by Alternatives A1 and D1 in this Feasibility Report, and submit the following determinations to Congress, in accordance with Section 4007(c)(2)(D) of the WIIN Act:
  - The Project is technically and financially feasible.
  - Sufficient non-Federal funding is available to complete the Project.
  - The Project sponsors are financially solvent.
  - A proportional share of the Project’s benefits are Federal benefits.
- Request that Congress fund the Federal share of construction.
- Request that Congress authorize Reclamation to increase the construction cost to allow for escalation from stated price levels (2019) to the notice to proceed for each contract or work package, based upon Reclamation’s Construction Cost Trends publication or a similar source.

- Request that Congress annually appropriate funds so Project construction can occur in the most efficient and expeditious manner to avoid cost overruns and ensure timely completion.

- Request that Congress authorize and annually appropriate funds for OM&R to improve CVP Operational Flexibility.

Reclamation will study the use of excess storage capacity, when available, in Sites Reservoir for storage of CVP water to improve CVP Operational Flexibility.

Due to the complexity of the Project and the high Federal investment, Reclamation recommends validating the feasibility results in pre-construction and documenting any changes in a post-authorization report.

**Approvals and Funding**

The following approvals would be required for Project implementation.

**Costs** – The Federal cost request for construction (i.e., without IDC) assigned for Alternative A1 is $1,448 million, and the construction cost assigned for Alternative D1 is $1,638 million. This includes $93 million of funding for pre-construction for the Project. The non-Federal Project partners would be responsible for the balance of construction costs.

The Federal Government is assigned the full OM&R cost for CVP Operational Flexibility. The Federal Government is also assigned a share of the CVP conveyance costs for the IL4 Water Supply for CVPIA Refuges purpose.

**Cost Allocation and Assignment** – The WIIN Act (P.L. 114-322) Section 4007 allows the Secretary of the Interior to participate in a State-led storage project in an amount equal to 25 percent or less of the total cost of the project. The non-Federal partner is the Authority, which would be responsible for all costs that are not allocated to the Federal Government. The CWC has determined that the Sites Reservoir Project is eligible for $816 million in funding, including $40.8 million for pre-construction funding, from California through the WSIP process under Proposition 1. The State’s investment would fund the Authority for the capital costs allocated by the State to Project benefits that are considered public, including IL4 Water Supply for CVPIA Refuges, Delta Ecosystem Enhancement, Recreation, and Flood Damage Reduction benefits.

The Federal cost-share is representative of feasibility, and the Federal Government may change cost-sharing percentages within the project purposes as the Project continues to be developed by Reclamation and the Authority. Changes to cost sharing would be documented in a post-authorization report and could be reflected in the capital costs and/or OM&R.

In the NED Plan, the proposed Federal construction cost share for CVP Operational Flexibility is 100 percent; for Anadromous Fish it is 80 percent.
The Federal Government is assigned the full construction cost for the CVP Operational Flexibility purpose and approximately half the costs for the Anadromous Fish purpose. All other construction costs would be paid by the non-Federal partners.

All OM&R costs under the CVP Operational Flexibility purpose are assigned to the Federal Government and will be assigned using the existing rate-setting policies and cost pools and recovered through the existing rate-setting process.

It is assumed that the non-Federal Sponsors would make water available annually at no charge (i.e., make a donation to cover 100 percent of the OM&R expenses for the IL4 Water Supply for CVPIA Refuges purpose that are not attributable to conveyance) to the RWSP for the IL4 Water Supply for CVPIA Refuges purpose, consistent with the benefits analyzed in this report. The Federal Government would incur no cost for OM&R associated with this water other than the cost to deliver the water from the Sites Reservoir Project (i.e., the release of the water from the Delevan Pipeline) to the CVPIA refuges. The OM&R cost related to the conveyance of water to the refuges would be shared with the State, consistent with the CVPIA (75 percent Federal/25 percent State). This document makes no commitment of the use of CVPIA funds for any purpose.

The cost assignment, including the funding for OM&R, will be reevaluated in the post-authorization report,

Approval – As determined by the Secretary of the Interior, in accordance with the WIIN Act, and funded by Congress, the Authority and Reclamation can begin pre-construction activities.

Prior to physical construction, the Authority and Reclamation will develop a post-authorization report consistent with the final design, final EIR/EIS, permits, and other project agreements. The post-authorization report will define the final Federal participation, benefits, operations plan, and use of Federal facilities.

According to the WIIN Act, approvals are needed from the Secretary and Congress to proceed with construction (to include pre-construction activities). Funding appropriated in Fiscal Year 2021 would enable the Project to meet the anticipated construction schedule that has been developed by the Authority.

**Implementation Considerations**

**Water Rights**

The Authority will need to obtain water rights for a new storage facility from the State Water Resources Control Board (SWRCB) for the delivery and beneficial use of water, either by assignment of a State-filed application and/or through an application for a new water right. This would include the necessary points of diversion and rediversion, diversion rates and quantities, season of diversion, places of use, and purposes of use.

The Authority will be in partnership with Reclamation and DWR to modify the agencies water rights if the new storage facility will be taking excess Sacramento River water, which is water that is covered under Reclamation/DWR water rights, and storing that water in the Reservoir for use at a
later time in CVP/SWP places of use north and south of the Delta to meet or satisfy CVP/SWP obligations and/or environmental purposes under Reclamation and DWR water rights and BiOps.

**Agreements and Plans**
An Agreement in Principal and Project Partnership Agreement between Reclamation and the Authority will be developed to define various roles, responsibilities, and obligations for the construction of the Project for both parties as further defined in this chapter.

**Operational Agreements and Plans**
Per Article XIV and Article XVI of the 1986 operations agreement between the United States and the State of California for Coordinated Operation of the CVP and SWP, project operations must be reviewed when adding a state or Federal facility to the system. Although the facilities proposed under the P Alternatives would be locally owned (not Federal or state), an operations agreement between Reclamation and the Authority would be developed to address the long-term planning and integration processes and how the additional water supplies provided by the Project would be managed in coordination with existing water supplies and system features.

The Authority’s and/or its participating members’ use of Federal conveyance and appurtenant facilities will be subject to available capacity, and shall not impede the delivery of CVP water. The determination of available capacity and impediment of delivery of CVP water is at Reclamation’s sole discretion.

If electrical power is required to convey or pump the non-Project water into, through or from the project facilities, the Authority shall be responsible for the acquisition and payment of all electrical power and associated transmission service charges.

**Sites Reservoir Project Contracts with existing CVP Contractors**
The Authority will enter into agreements (consistent with the Operations Framework) with their Project Agreement Members, some of whom are existing CVP contractors, for a supplemental water source delivered from Sites Reservoir, purchased through the upfront capital project cost. The Authority shall not provide Sites Reservoir Project water to an existing CVP contractor in lieu of a CVP allocation under the Authority’s existing CVP contracts, including any water transferred out by the CVP contractor.

Users of Sites Reservoir water shall hold the United States harmless for any change in water quality caused by the conveyance of water through or in Sites Reservoir.

**Use of Storage Capacity in Sites Reservoir**
The United States would enter into an agreement with the Authority that would allow Reclamation to use excess storage capacity in Sites Reservoir to improve the operational flexibility of the CVP.

**Regulatory and Related Requirements for Environmental Compliance**
Construction and operation of the NED Plan would be subject to the requirements of Federal, State, and local laws, policies, and environmental regulations, as described in this Feasibility Report, and/or as supplemented or modified by authorizing legislation. Reclamation and/or the Authority

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5 Note that DWR and Reclamation agreed to an addendum to COA in December 2018 outlining key changes on how reservoir releases and export capacity will be shared.
would need to obtain various Federal, State, and local permits and regulatory authorizations before Project construction would begin. A list of potential permits and approvals is included in Appendix K.

Federal, State, and local agencies with permitting or approval authority are expected to use the forthcoming Final EIS/EIR and the Supplement to make decisions and/or issue permits for an authorized project. Implementation of an authorized project would include review of prior consultation under the Fish and Wildlife Coordination Act and implementation of any associated recommendations, as appropriate. In addition, permits and consultations may be required with the U.S. Army Corps of Engineers, the California Department of Fish and Wildlife, the National Marine Fisheries Service, and USFWS.

**Pre-Construction Activities**
The Federal cost share of pre-construction activities is estimated at $104 million (the total pre-construction cost is estimated at $420 million). Pre-construction activities consist of development of a post-authorization report, engineering, development of operations plans, development of the Project Partnership Agreement, permits and approvals, and land acquisition.

**Construction**

Early construction activities (primarily associated with providing access to the major facilities for construction) will begin in 2021. The Authority plans to complete design by the end of 2022. Construction of the dams, pumping plants, and pipelines is expected to require 7 to 8 years.

**Timeline**

Figure ES-5 shows a timeline of major actions to complete the NODOS Investigation and future milestones leading to implementation of the Sites Reservoir Project.
<table>
<thead>
<tr>
<th>Phase</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
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CEQA = California Environmental Quality Act  
EIR = Environmental Impact Report  
EIS = Environmental Impact Statement  
NEPA = National Environmental Policy Act  
NOD = Notice of Determination  
ROD = Record of Decision

Figure ES-5. Sites Reservoir Project Timeline