California WATER COMMISSION

Water Storage Investment Program Concept Paper Form

Please complete the questions below and return your completed concept paper by email to cwc@water.ca.gov by 5:00 p.m. on March 31, 2016. Completed concept papers should not exceed four pages.

Contact Information

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Agency/Organization Name: South Sutter Water District	
Agency Type (select one):	☒ Public Agency ☐ Nonprofit Organization ☐ Public Utility ☐ Tribe ☐ Mutual Water Company ☐ Local Joint Powers Authority ☐ Other:

Project Information

Project Name: Camp Far West Reservoir	
Project Type:	☐ CALFED Surface Storage ☐ Groundwater Storage ☐ Groundwater Contamination Prevention or Remediation ☒ Conjunctive Use ☐ Reservoir Reoperation ☒ Local Surface Storage ☐ Regional Surface Storage ☐Other:
Estimated Project Cost: $16 million	
Estimated WSIP Funding Request: $7 million	

Please describe your project, including location, water source, facilities, and operations:

South Sutter Water District (SSWD) was formed in May 1954 to develop, store and distribute surface water to agricultural lands in southern Sutter and northwestern Placer counties.

Camp Far West Dam and Reservoir is owned and operated by SSWD to provide agricultural irrigation water in Sutter and Placer Counties. The reservoir is located on the Bear River, about 6.5 miles east of Wheatland, California. The proposed project would raise the existing spillway crest by five (5) feet creating an additional 10,000 acre feet of storage. The development of additional storage will provide operational flexibility for ground water recharge, irrigation, and downstream ecosystem benefits including benefits in the Delta.

Dam construction began in June 1962 and was completed in January 1964. Camp Far West Dam is an earth fill embankment with a height of 185 feet, measured from the original streambed to the dam crest at elevation 320 feet. The main dam crest is approximately 2,070 feet long. The total crest length, including the wing walls and northern dike, is approximately 6,550 feet. The existing spillway is an ungated, ogee-type reinforced concrete structure. At the spillway crest (Elevation 300 feet), the corresponding design storage is 104,400 acre-feet. Aerial surveying and topographic mapping was authorized by the District in October 2007, which included

topographic and bathymetric surveys. These surveys were used to develop a new elevation-storage table for Camp Far West, which showed that at the spillway crest, the corresponding storage was 93,740 acre-feet, a roughly 10 percent decrease in storage. This decrease in storage is attributed to sediment accumulation within the reservoir.

In 1956, prior to the expansion of the Camp Far West Reservoir, 20,955 acres were irrigated with 109,000 acre-feet of water. Approximately 90,000 acre-feet were pumped from the groundwater basin and the remainder was supplied from surface water sources. A consequence of groundwater pumping by private agricultural wells was that groundwater elevations in the SSWD service area declined by one to three feet each year, representing an extraction of water that exceeded recharge by from 10,000 to 11,000 acre-feet per year.

To counteract this decline, SSWD landowners developed Camp Far West Reservoir on the Bear River and constructed an associated surface water distribution system. In 1964 these facilities were completed and new canals and low-pressure pipelines allowed SSWD to deliver surface water to agricultural lands in the District. Since completion of Camp Far West Reservoir, surface water deliveries have ranged between 70,000 and 130,000 acre-feet per year. Additional water is pumped from Groundwater to augment surface water. As many as 13,000 acres are reportedly irrigated with only groundwater. Groundwater also augments surface water deliveries in other areas of the District, particularly during drier years.

In addition to releases from Camp Far West, SSWD annually receives from 15,000 to 17,000 acre-feet of additional surface water from Nevada Irrigation District (NID). In 2015, NID's agreement to deliver water to SSWD expired and this source of surface water is expected to cease, an event that is likely to increase the District's reliance on groundwater.

The groundwater basin has, historically, responded well to conjunctive management and it has demonstrated a strong groundwater level rise during the periods of high surface water availability. Therefore, increasing reservoir capacity would provide the opportunity for conjunctive management of surface and groundwater and improve water supply reliability for the District.

The goal of this project is to increase surface water supply and conjunctive use management by increasing storage capacity and increase groundwater recharge during wet years and efficient extraction during dry years. The raising of the existing spillway would capture additional wet year water for multiple purposes including water reliability, ecosystem enhancement, flood damage reduction, and hydropower generation. In dry and critical years water could be available for transfer and provide downstream tributary and Delta ecosystem benefits.

Per Water Code section 79753, the Commission may only fund the public benefits of water storage projects. Further, ecosystem improvements must make up 50% of the funded public benefits (Water Code section 79756(b)). What public benefits does your project provide? (select all that apply):

☒ Ecosystem Improvements ☒ Water Quality Improvements ☒ Flood Control
☒ Emergency Response ☒ Recreation

Please describe the magnitude of the public benefits and how the project will be operated to provide the public benefits:

(1) Ecosystem improvements, include additional water made available through transfer during the period of July, August and September. This period avoids primary life cycle timing of anadromous fish in the Bear River, while suppling water for wildlife and riparian habitat to tributaries to and in the Delta.

(2) Water quality improvements into the project area are high quality Bear River flows, increasing the proportion of surface water in irrigation supplies would not hinder crop production or lower the quality of water draining from farm fields. Reducing groundwater usage during periods of abundant surface water supplies will increase the volume of recharge available to support local aquifers and will both support groundwater elevations and enhance groundwater quality in the regional aquifer. The high quality groundwater stored in local aquifers would then be available for local use during periods of restricted surface water availability. Water transfers using either surface water or groundwater would provide a high quality source of water for transfer recipients thru the Delta.

(3) Flood control benefits, from increased storage in Camp Far West will provide operational flexibility in response to the effects of changing hydrology and decreasing snow pack on California's water and flood management system.

(4) Emergency response includes an additional 10,000 acre feet of available water supplies and flows for dilution and salinity during emergency drought conditions.

(5) Recreational purposes at Camp Far West includes and existing camp grounds and marina that will benefit form more storage in the reservoir and generally associated outdoors activities.

Water Code section 79752 requires that funded projects provide measurable improvements to the Delta ecosystem or to the tributaries of the Delta. Please describe how your project provides ecosystem improvements in the Delta or tributaries to the Delta:

The objective of this project is to increase available storage in Camp Far West reservoir which will promote conjunctive management of the SSWD system. One aspect of more storage at Camp Far West means that the system can better distribute available surface water to meet the demands of rice field flooding. Increasing the District's capacity to make timely deliveries of surface water will reduce groundwater pumping and promote in-lieu recharge. During dry years the additional groundwater stored through in-lieu recharge will strengthen water supply reliability within the District and for tributaries to the Delta.

The SSWD's experience has been that during years when large quantities of surface water are available, the underlying groundwater basin responds to deep percolation from extensive use of surface water; and that during dry periods, the recharged aquifer has provided a reliable supply to augment surface water. In short, the basin has responded well to conjunctive management and has demonstrated a strong groundwater elevation recovery rate during periods of high surface water availability.

The addition of 10,000 acre –feet of water in Camp Far West for this proposed project will provide

ecosystem improvements in the Delta by providing groundwater available for pumping to agricultural lands and downstream tributaries in the region and consequently ecosystem improvements in the sloughs and rivers of the Delta. Regional benefits to ecosystem habit in the tributaries to the Delta will be provided by continued wetland habitat provided by rice production wetlands.
The project can provide flexibility increase Delta outflow to provide low salinity habitat for Delta smelt, longfin smelt, and other estuarine fishes in the Delta, Suisun Bay, and Suisun Marsh.

Water Code sections 79755 and 79757 require the Commission to make a finding that a project will advance the long-term objectives of restoring ecological health and improving water management for beneficial uses in the Delta prior to allocating funding for a project. Please describe how your project could help advance the long-term objectives of restoring ecological health and improving water management for beneficial uses in the Delta:

Enlarging the capacity of SSWD's reservoir will enhance the District's capacity to utilize existing surface water supplies to deliver surface water, will support in-lieu recharge of the local aquifer and will protect the aquifer as a reliable water source during periods when surface water supplies are limited. These outcomes will support the goal of increasing the District's dry year water supply reliability and improve water management to provide additional flow and beneficial water for ecology in the Delta.

Additional benefits of the Project include:

- Increased flexibility and reliability of surface water deliveries in dry years for downstream use
- Increased groundwater recharge and ground water reliability
- Additional capacity to meet water needs outside of SSWD
- Improved water management operation through storage capacity increase
- Enhanced conjunctive water management activities to enhance ecology in the Delta.

Please describe any other benefits provided by your project, such as water supply reliability benefits, and the potential beneficiaries:

Water supply reliability benefits Irrigation water demands in the District according to cropping pattern, hydrologic year type and other factors. Because a high percentage of the District is devoted to rice cultivation, demands fluctuate less in SSWD than in many other districts because the cropping pattern is stable and because much of the demand for rice irrigation arises from cultural practices that are relatively insensitive to hydrologic conditions.

Other benefits in the District include releases from Camp Far West Reservoir for the purposes of maintaining in-stream flow requirements in the Bear River and providing water pursuant to the Bay-Delta Settlement Agreement between SSWD and DWR. Releases for the maintenance of fish flows are required every year while release pursuant to the Bay-Delta Settlement Agreement occur only in Dry and Critical year types.

Increased storage also provides climate variation benefits to manage spatial and temporal changes in snow pack.