

Main Diversion Modernization Project

FY22 WaterSMART: Small-Scale Water Efficiency Projects

[South Sutter Water District](#)

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Executive Summary

Date: April 27, 2022

Applicant Name: South Sutter Water District

City, County, State: Trowbridge, Sutter County, California

Applicant Category: Category A – Irrigation District

Project Summary

The South Sutter Water District (SSWD or District) proposes installing Rubicon SlipMeters, which are a critical component of its modernization plans to significantly improve water management accuracy, ultimately resulting in less spillage, and improved conservation. The project will replace SSWD's 1950s main radial arm diversion gate with three Rubicon SlipMeters and implement Supervisory Control Data Acquisition (SCADA) to provide remote monitoring and control of the gates as well as accurate flow measurement. Currently, SSWD does not have flow meters in place to accurately measure water movement through the canal and must manually adjust the current gate to alter the flow. By modernizing the existing conveyance equipment, SSWD will gain accurate flow measurements and automated flow controls, and thus be able to flexibly and responsively adjust flow rates to match with downstream demands thereby only releasing water reserves as needed. This project will help the District adapt to and mitigate the effects of climate change while being mindful stewards of water resources during a prolonged drought.

Project Timeline

Assuming a project start date of March 31, 2023, the estimated project period is 12 months, with an anticipated completion date of March 31, 2024.

Project Location on Federal Facility

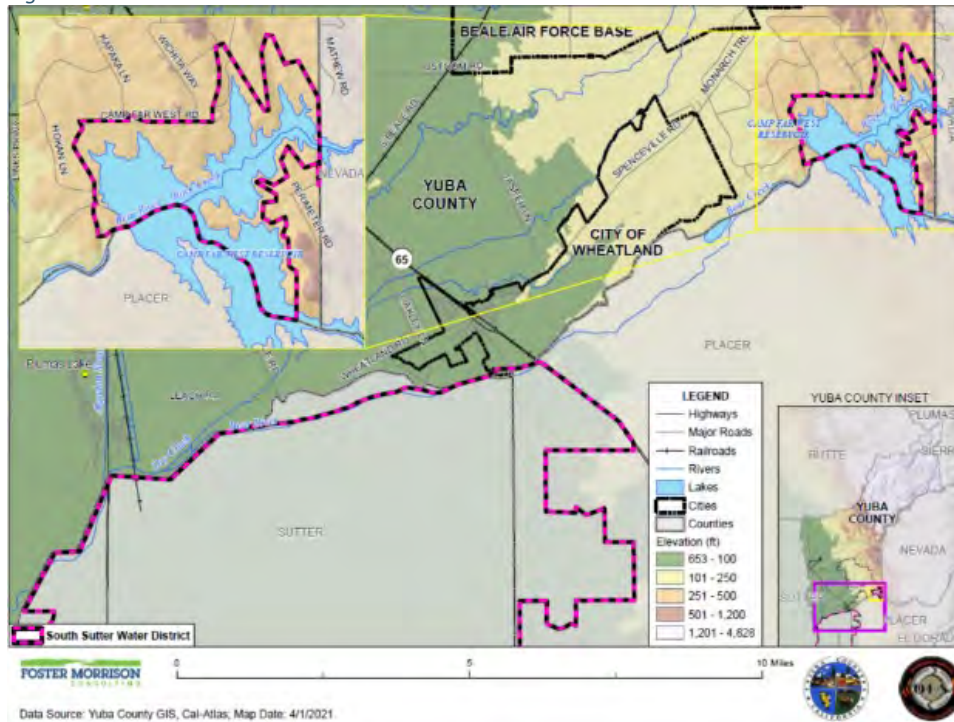
The proposed program is not located on a federal facility.

Project Location

South Sutter Water District (SSWD) was established by a majority of landowners within the boundaries of the District in May 1954 in Trowbridge, CA. The purpose of the District is to develop, store, and distribute surface water supplies to reverse the effects of groundwater pumping on a dwindling aquifer.

SSWD is located along the western toe of the Sierra foothills just south of the lower reaches of the Bear River between the Camp Far West Reservoir and the Bear River's confluence with the Feather River in southern Sutter and western Placer Counties, located within the southeastern portion of the Sacramento Valley Groundwater Basin, at the northern end of the North American Subbasin which is one of 18 subbasins within the Sacramento Valley Groundwater Basin. The District's service area encompasses a total gross area of 63,972 acres of which 6,960 acres are excluded for a net area of 57,012 acres within which approximately 40,107 acres are in Southern Sutter County, 16,905 acres are in Western Placer County, and approximately 1,920 acres in Yuba County.

Figure 1. South Sutter Water District Location



The major supply of surface water available to the District, used primarily for agricultural irrigation, comes from the Bear River where SSWD holds licensed appropriative surface water rights for direct diversion, as well as storage in Camp Far West Reservoir. In addition to surface water rights to the Bear River, SSWD holds water rights to divert local surface water from several small streams within its boundaries including Yankee Slough, Raccoon Creek, Markham and Auburn ravines, and the East Side Canal. SSWD utilizes these small streams as part of its conveyance system to redistribute and deliver Bear River from Camp Far West Reservoir. Please see Appendix A for a background on the District’s Surface Water Rights.

In 1956, prior to the expansion of the Camp Far West Reservoir, approximately 20,955 acres (38% of the net SSWD area) was irrigated with approximately 109,000 acre-feet (AF) of water. Approximately 90,000 AF was pumped from the groundwater basin and the remainder from surface water sources. The development of surface waters, primarily enlarging Camp Far West Reservoir and developing a distribution system, was an effort by SSWD landowners to augment and develop alternatives to a declining groundwater table lowered by private agricultural wells within the service area. The groundwater basin was steadily declining 1 to 3 feet, or by as much as 10,000 to 11,000 AF, per year.

In 1964, Camp Far West Reservoir was completed on the Bear River to serve SSWD and Camp Far West Irrigation District. New conveyance canals and some low-pressure pipelines allowed SSWD to deliver 63,630 AF of surface water to farms in the region. With the exception of severe drought years, surface water deliveries over time have ranged from 70,000 AF to over 130,000 AF per year. The Dam and reservoir facilities are located in Yuba and Placer Counties and serve members in both Placer and Sutter Counties. SSWD owns and operates the dam and associated

facilities to provide surface water, power generation, and recreational opportunities to the surrounding communities.

The purpose of the District is to bring 80,000 AF of surface water on an annual basis into the District to stop further depletion of the ground water basin. The average delivery per year from 2016 through 2020 is approximately 88,886 AF.¹ The average delivery per year from 1965 through 2016 is approximately 103,311 AF.² This includes the drought year of 1977 when no water was delivered and the drought years of 2012 to 2015 when the District delivered about 50% of the normal deliveries. The District has been able to stabilize the ground water basin even though a majority of the landowners must continue pumping from that basin annually.

The annual available water supply from Camp Far West Reservoir is allocated each year, and a full reservoir represents only a portion (approximately 1.4 AF per acre) of water users' demands. Water released from the Reservoir is rediverted from the Bear River, at a point approximately 13 miles downstream from Camp Far West Dam, into the District's conveyance canal system which runs predominately north to south along the higher eastern border of SSWD. Through turnouts and head gates, water is directed into canals, the Bear River pipeline, and natural channels running from east to west, and is distributed to water users. Flows conveyed through the District's delivery system are measured and provided to customers at turnouts via gravity or pumps; all 382 turnouts are measured by McCrometer propeller meters. The District does not own or operate any groundwater wells.

The proposed project will take place at the main canal water diversion point located in the Bear River at coordinates 39°02'30"N 121°19'54"W at the Camp Far West Dam and Reservoir.

Figure 2. Project Location



Technical Project Description

At present, South Sutter Water District's (SSWD) manages surface water from multiple sources to deliver supplemental irrigation supplies for rice and other agricultural products, along with landowner private groundwater pumping. Unfortunately, flow rates and volumes are not well measured, although estimates are made at various locations. The District must modernize and have better knowledge and control of flows in the distribution system to respond to future

¹ See Appendix A for Summary of Surface Water Deliveries

² South Sutter Water District website: <http://www.southsutterwd.com/about/>

limitations on water supplies, and the need to route available supplies to specific areas in the district to meet local shortages.

SSWD's existing main diversion gate was placed in the Bear River the 1950s. Surveys were not conducted during gate installation to chart set positions and corresponding flow rates, and a staff gauge was placed arbitrarily. As such, SSWD staff are reliant on operator experience and estimates from a properly surveyed staff gauge 1.5 miles and 2.5 miles downstream to assess relative flow. This means that the district does not have any reliably accurate flow measurement at its main diversion gate, and SSWD staff is not aware of water supply or management issues until it is too late, i.e., water tenders not receiving the amount ordered or spillage. Compounding the problem are current gate leaks on the sides and through the bottom due to aging which is a concern during the third consecutive year of drought in California.

The proposed modernization project includes retrofitting the existing main diversion works to accept three Rubicon SlipMeters (Model SMB1500-6000), installation of Rubicon SlipMeters and associated equipment, and implementation and training of SCADA to provide remote monitoring and control of the gates, and equipment commissioning.

The proposed project will begin with civil design support provided by a professional engineering service. Civil design support will include a field visit, preliminary and final design needed to inform the retrofit of the existing concrete diversion structure to accept the new SlipMeters. The existing concrete diversion structure will then be retrofitted by creating reinforced concrete bays capable of accepting the Rubicon SlipMeters. With the oversight of a professional engineering firm, SSWD staff will be responsible for removing the existing gates and adding the concrete bays needed to accommodate the gates, while expanding the existing metal walkway above the weir to hold the gates control pedestal, remote mounted masts, solar panels, batteries, and RTU processor out of the water.

The SlipMeter units are self-contained including frames, gates, built-in Sonaray flow measurement, actuator mechanism, control pedestal, remote mounted masts, solar panels, batteries, and RTU processor. The package will also include an upstream open air water level sensor. Each SlipMeter has a maximum flow area of 60" x 60" with a minimum flow capacity of 6.6 CFS and maximum flow of 158 CFS, thus providing a total combined maximum capacity of approximately 475 CFS.

The SlipMeter frames will be set in place using stainless steel anchor bolts as recommended by the vendor, Rubicon. A Rubicon certified Field Technician will install the external frame, supervise the dropping of the gate/meter into the frame, wire the control pedestal to a meter, and commission and train SSWD staff in the operation and maintenance of the meter.

Following the installation of the SlipMeters, the professional engineers will develop and install a District-owned, open-source SCADA Human Machine Interface (HMI) with integrated alarming and reports for remote monitoring and control of the gates. The HMI will be designed to integrate with a diversity of potential future SCADA sites regardless of equipment manufacturer. The HMI database will be designed using a universal Structured Query Language

and will run through a District desktop computer that provides additional reporting and data management capabilities.

The HMI will be built using Inductive Automation's "Ignition SCADA" desktop and mobile phone platforms for monitoring, control, alarming, and reports. The license for this platform supports unlimited future integration of other remote sites at no additional licensing cost.

The Project supports SSWD's goal of improving water supply reliability, increasing delivery flexibility, expanding data collection and monitoring, and improving safety and reducing operation costs. Modernizing the Main Diversion is essential to better match irrigation demands, limit operational spills, and realize annual water savings.

Evaluation Criteria

Evaluation Criterion A – Project Benefits

Anticipated water management benefits to water supply delivery system and water customers.

The proposed modernization project will allow SSWD to manage water more effectively and more reliably to meet customer needs. In 2007, the District contracted with the Irrigation Training and Research Center (ITRC) from California Polytechnic State University to perform a Rapid Appraisal Report (Appendix B). The report indicates that the District lacks the appropriate equipment to accurately control and measure available water supply in the distribution system and discharges at key points. The existing gate at the main diversion was placed in the 1950s. Unfortunately, no survey was conducted when the gate was installed to chart set positions and corresponding flow rates. SSWD staff are reliant on estimates using instantaneous measurements with nontechnical tools like staff gauges to assess relative flow. The current gate also leaks on the sides and through the bottom due to aging. A recommendation of the Rapid Appraise Report is to deploy SCADA systemwide in a phased approach, with the initial stage involving the capability to remotely monitor and control flows in real-time at the main canal headworks. The proposed project is the first step the District is taking to modernize its system, by enabling the District to accurately measure the amount of water being released through the District's main water diversion point located in the Bear River.

The proposed project will also help the District ensure that customers receive their annual water allocation by increasing the District's ability to monitor the net-usage of water more accurately. The main disadvantage of calculating delivered water volumes based on an instantaneous measurement is that the measurement device doesn't directly record the volume of delivered water. This can be problematic for two reasons. First, an accurate record of the duration of the delivery must be needed to convert the instantaneous measurement of flow rate into a volume. Secondly, if there are fluctuations in water surface elevations throughout a delivery, these fluctuations will affect the rate of discharge, and hence, the volume of water delivered. The lack of modern flow measurements means that the District is unable to accurately measure the discharge volume at the main diversion point and, therefore, cannot determine net-usage or spillage rates downstream. The District currently estimates it loses 500 – 1,000 AF of water annually in spillage, but this is a rough estimate based on instantaneous measurements.

Additionally, SSWD utilizes many natural creeks and streams for water delivery. During dry conditions, these natural channels soak up water very quickly. Last year, ground conditions were very dry, and the District was forced to shut down a month early because of water loss. Agricultural users were given notice and had to rely on well water for the remainder of the season. Growers who saved their allocation until the end of the year were not able to receive any water from the District. With a more accurate measure of gross flow at the diversion point, the District would be able to measure net-usage after water loss due to dry conditions. The District will then be able to adapt delivery methods to compensate for water loss, including coordinating delivery to clustered customers to avoid excess loss from dry channels.

The proposed project will also enable the District to remotely control flow rates through the new SlipMeters using SCADA. Currently, SSWD operators must travel 20 miles to and from the main office to manually raise and lower the existing gate to estimate flow and adjust the diversion rate. These adjustments are often done between 3am and 4am, in the dark. The proposed project will result in reduced staff time and fewer miles traveled to measure flow and manually adjust the existing gate.

Modernizing the main diversion canal with SlipMeters and SCADA will give SSWD the ability to accurately measure real-time flow measurements and discharge rates as well as enable the District to be more responsible, nimble, and efficient in their water management practices.

Describe the broader benefits that are expected to occur as a result of the project.

Installation of the flow meters will allow SSWD and growers to have an accurate measurement of net water use. This data will allow farmers to better regulate use of irrigation water and avoid overwatering.

Additionally, SSWD is a conjunctive-use District in which growers in the District pump some of their water supply from the North American Subbasin and supplement this supply with surface water delivered by SSWD. Landowners are encouraged to first purchase and use available surface water and to use groundwater supplies to augment surface water supplies. The proposed project will help SSWD manage and conserve surface water supplies more accurately and efficiently. With more efficient and reliable surface water supplies, growers will be able to pump less water from the North American Subbasin.

Finally, the District intends to share flow data gleaned from the installation of SCADA with the region. SSWD is one of five acting Groundwater Sustainability Agency (GSA) within the North American Subbasin, and the five GSAs work closely together to achieve the conservation goals outlined in the North American Subbasin Ground Water Sustainability Plan they published collectively in 2020. The Project will help bolster real time performance measurements and the resulting data will assist other water users in the subbasin to set water schedules more accurately.

Evaluation Criterion B – Planning Efforts Supporting the Project

Plan Development: Describe how your project is supported by an existing planning effort.

In March 2021, SSWD adopted its 2020 Agricultural Water Management Plan (AWMP, or the Plan). The District has consistently developed and prepared Water Management Plans in accordance to Water Code Section 10826 and updates them regularly. The 2020 Plan is an update to previous 2015 AWMP. During the development of the 2020 Plan, the District notified each city and county within its service area and opened the Plan for public comment, including holding a public hearing to receive input and comments. Following the public hearing and input from stakeholders, SSWD reviewed and formally adopted the AWMP as part of the District's strategy to enhance overall system management. The District distributed copies of the adopted AWMP to its partners including the Department of Water Resources, Placer County, Sutter County, and neighboring Camp Far West Irrigation District. The District has planned the next AWMP development cycle for 2025.

Support for the Project: Describe to what extent the proposed project is supported by the identified plan.

The 2020 AWMP includes several actions related to surface water efficiency improvements and long-term sustainability of the water supply within the District including fourteen Enhanced Watershed Management Program (EWMPs). EWMP 5 is a capital improvement program to address the sustainability and modernization of its water delivery system including the replacement and automation of the radial headgates on the Main Canal as part of a conveyance canal improvement plan (see Appendix A). The proposed project will fulfill this goal by installing three SlipMeters to replace the current, outdated radial headgate and automate the new gates using SCADA. In the *Schedule and Budget To Implement EWMPs* outlined in the Agricultural Water Management Plan, the modernization of the delivery system outlined in EWMP 5 is the highest priority activity that is not currently underway or already fully implemented.

SSWD is also the acting Groundwater Sustainability Agency (GSA) within its service area in the North American Subbasin. SSWD along with four other GSAs work together to ensure that the entire subbasin is covered by GSAs that work directly with constituents. The five GSAs include: Reclamation District 1001 GSA, Sacramento Groundwater Authority GSA, South Sutter Water District GSA, Sutter County GSA, and West Placer GSA. These five districts have worked together since early 2017 to prepare a Ground Water Sustainability Plan (GSP) for the 535 square-mile North American subbasin that includes portions of Placer, Sacramento, and Sutter counties. In 2020, the GSAs published the [North American Subbasin GSP](#) which identifies several sustainability goals including preventing the chronic lowering of groundwater levels and preventing depletion of surface water. The first identified project to address these goals is the expansion of conjunctive use by reoperating existing water distribution infrastructure. The intent of project is to better manage surface water to reduce existing demand on ground water. As a participating GSA, South Sutter Water District is expected to update their groundwater distribution operations to provide surface water more efficiently to users and reduce customers' need to extract groundwater from their wells. The proposed Project will help SSWD's reoperate their main radial arm diversion gate to provide remote monitoring and control water flow rates. By modernizing this vital equipment, SSWD will be able to responsively adjust flow rates to only release the water needed to meet downstream demand,

reduce spillage, and conserve surface water supply throughout the irrigation season. Because SSWD is a conjunctive use district, prolonging the supply of surface water in the District will reduce demand on groundwater thus combatting chronic lowering of groundwater levels.

Please see Appendix C for Letters of Support.

Evaluation Criterion C – Implementation and Results

Describe the implementation plan for the proposed project.

The expected project schedule including major tasks, milestones, and dates is shown in the table below. SSWD proposes to implement construction activities for the project during its offseason between October and March.

Table 1. Estimated Project Schedule

Milestones/Tasks		Estimated Timing
BOR Environmental and Cultural Compliance		1 month
Site Visit		1 month
Preliminary Design		2 months
Final Design		2 months
Equipment Order and Delivery		20 weeks
Construction	Removal of Existing Gates	1 month
	Concrete and Walkway Work	
	Install New Gates	
SCADA Integration		4 months
Reporting and close out		3 months

Describe any permits that will be required, along with the process for obtaining such permits.
SSWD does not anticipate the need for any permits.

Engineering or design work performed specifically in support of the proposed project.

SSWD will complete engineering and design by contracting with an engineering firm that will conduct a field site visits as well as preliminary and final design services. The field site visit is necessary to gather information relevant to facilitate design services. Preliminary design will include development of preliminary design drawings and completion of a Basis of Design Report (BOD). Final design will consider the comments and revisions suggested by SSWD.

Describe any new policies or administrative actions required to implement the project.

The proposed project will be the first installation of SCADA technology in SSWD. SSWD staff will receive training from the professional engineering firm on how to use the SCADA technology. SSWD will develop internal policies and procedures for operating the SCADA technology and management historical SCADA data including developing a policies and procedures manual for current and future employees.

Describe the timeline for completion of environmental and cultural resource compliance.

SSWD consulted with regional BOR staff to review the proposed project and secure environmental and cultural resource compliance costs and timeline. BOR staff provided a conservative estimate anticipating 61 hours spent on compliance review and approval, totaling \$9,970.25. See Appendix D for quotes.

Evaluation Criterion D – Nexus to Reclamation

Is the proposed project connected to a Reclamation project or activity? If so, how?

The proposed project is not connected to a Reclamation project or activity.

Does the applicant receive Reclamation project water?

The applicant does not receive water from Reclamation.

Is the project on Reclamation project lands or involving Reclamation facilities?

The proposed project is not on Reclamation lands or involve Reclamation facilities.

Is the project in the same basin as Reclamation project or activity?

The project is located in the North American Subbasin. The North American Subbasin includes five Groundwater Sustainability Agencies (GSAs) that have worked cooperatively to develop a single [Groundwater Sustainability Plan](#) (GSP) covering the 535 square-mile subbasin that includes portions of Placer, Sacramento, and Sutter counties. The GSAs include Reclamation District 1001 (RD 1001) GSA; Sacramento Groundwater Authority (SGA) GSA; South Sutter Water District (SSWD) GSA; Sutter County GSA; and West Placer GSA.

Will the proposed work contribute water to a basin where a Reclamation project is located?

SSWD is a conjunctive use water district in which growers in the District pump approximately two-thirds of their water supply from the North American Subbasin and supplement this supply with surface water delivered by SSWD. The proposed project will help SSWD manage and conserve surface water supplies more accurately and efficiently. With more efficient and reliable surface water supplies, growers will be able to pump less water from the North American Subbasin.

Evaluation Criterion E – Presidential and Department of the Interior Priorities

Climate Change - Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, worsening erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also rising.³ In terms of water supply, climate change exacerbates uncertainty surrounding planning for and dealing with increasingly extreme droughts and storm events that affect the surface water supply in South Sutter Water District.

³ California Office of Emergency Services, [2018 California State Hazard Mitigation Plan](#)

SSWD uses many natural creeks and streams for water delivery. As climate change advances and drought conditions intensify, these natural waterways experience severe dry ground conditions, causing excessive water loss due to seepage as water travels downstream. In the SSWD service area, one natural waterway at the end of the canal experiences heavy water loss due to seepage which, in past years, resulted in growers receiving an estimated 10 cubic feet (CF) for every estimated 15 CF released into the waterway at the Main Diversion. Recently, however, dry conditions have exacerbated water loss so drastically that for every estimated 15 CF released, only an estimated 2 CF could be drawn. Last year, the ground conditions were extremely dry and the district was forced to shut down a month early. Agricultural users were given notice and had to rely on well water for the remainder of the season. Growers who saved their allocation until the end of the year were unable to receive any water from the District.

Currently, the amount of water lost during dry ground conditions is not measurable because there is no accurate flow metering at the main canal. Water tenders cannot accurately measure water loss nor nimbly adjust delivery practices to compensate for such loss. The proposed project would enable the water district to accurately measure the amount of seepage due to dry ground conditions and adjust delivery tactics to avoid excess carriage loss during dry conditions. Such adjustments may include coordinated releases to clusters of customers who are served by natural waterways to avoid multiple occurrences of extreme seepage during dry conditions.

Disadvantaged or Underserved Communities - South Sutter Water District's service is rural, largely agricultural, and faces economic and environmental vulnerabilities. Most of SSWD's service area is in Census Tract 511 in Sutter County, with small portions of the service area also spilling into Census Tract 213.22 in Placer County. The US Department of Transportation (DOT) has determined that Census Tract 511 in Sutter County meets the agency's definition as a historically disadvantaged community. To meet this definition, census tracts must exceed the 50th percentile (75th for resilience) across at least four of the six transportation disadvantaged indicators. SSWD's service area qualifies for all six disadvantage indicators which include:

1. **Transportation access disadvantage** identifies communities and places that spend more, and longer, to get where they need to go. (CDC Social Vulnerability Index, Census America Community Survey, EPA Smart Location Map, HUD Location Affordability Index)
2. **Health disadvantage** identifies communities based on variables associated with adverse health outcomes, disability, as well as environmental exposures. (CDC Social Vulnerability Index)
3. **Environmental disadvantage** identifies communities with disproportionate pollution burden and inferior environmental quality. (EPA EJ Screen)
4. **Economic disadvantage** identifies areas and populations with high poverty, low wealth, lack of local jobs, low homeownership, low educational attainment, and high inequality. (CDC Social Vulnerability Index, Census America Community Survey, FEMA Resilience Analysis & Planning Tool)
5. **Resilience disadvantage** identifies communities vulnerable to hazards caused by climate change. (FEMA National Risk Index)

6. **Social disadvantage** identifies communities with a shared history of discrimination, or other forms of disadvantage that warrant consideration along with each/any of the above measures. (CDC Social Vulnerability Index)

The DOT [Transportation Disadvantaged Census Tracts](#) map for the SSWD service area can be found in Appendix E.

An examination of the same area using the [CalEnviroScreen 4.0](#) also reveals that the census tract experiences a higher burden of pollution and socioeconomic stressors compared to all other census tracks in the State. The tool indicates how disadvantaged a community is through a score of 1-100, where a high score indicates a higher burden. The overall CalEnviroScreen community scores are driven by indicators, such as environmental exposure, environmental effect, sensitive population, and socio-economic factor indicators.

Census Tract 511 is in the 52nd overall percentile for the CalEnviroScreen 4.0 and 55th percentile for pollution burden. Due to the large agricultural presence, residents are at high risk for pesticide exposure and impaired waters ranking in the 93rd and 95th percentiles for these vulnerabilities, respectively. Compared to the rest of California, the area is in the 51st percentile for poverty and 56th percentile for unemployment meaning it is above the median poverty and unemployment rate for the State. The CalEnviroScreen 4.0 report can be found in Appendix F.

Climate change affects rural agricultural producers greatly because they depend on specific climate conditions and a certain amount of water to make their crops viable. The proposed project allows SSWD to accurately and reliably deliver water to its rural agricultural producer customers.

Tribal Benefits - The proposed project will not impact Tribes in the region.

Project Budget

Funding Plan

The Table below summarizes the funding sources for the Project. SSWD is committed to providing the \$141,435.89 match (58%) from District General Funds.

Overlap or Duplication of Effort Statement: This project does not have federal partners and the district has not requested or received funding from other sources for this project.

Funding Sources	Amount
Non-Federal Entities	\$141,435.89
South Sutter Water District General Funds	
Federal Entities	\$100,000
Requested WaterSMART Small-Scale Funding	
Total Project Funding	\$241,435.89

Budget Proposal

Budget Item Description	\$/Unit	Quantity	Quantity Type	Total Cost
Direct Costs				
Salaries and Wages				
Water Tender 1	\$25.66/Hr	30	Hrs	\$769.8
Water Tender 2	\$23.43/Hr	30	Hrs	\$702.9
Equipment Operator	\$21.80/Hr	18	Hrs	\$392.4
Fringe Benefits - not applicable.				
Equipment - not applicable.				
Travel - not applicable.				
Supplies and Materials				
Concrete (80lb bag)	\$4.28/bag	356	Bag	\$1,523.68
Rebar	\$0.60/ft	340	Ft	\$204
Angle Iron	\$2.54/ft	125	Ft	\$317.5
Bar Grating, Serrated	\$410.59/each	4	Each	\$1,642.36
Channel Tubing	\$1.90/ft	30	FT	\$57
Contractual				
Rubicon – SlipMeter equipment and installation	\$144,560/each	1	Each	\$144,560
Davids Engineering – Design, Engineering, Construction Oversight and SCADA	\$81,296/each	1	Each	\$81,296
Third-Party In-Kind Contributions - not applicable.				
Other				
Environmental Compliance	\$29,970.25/each	1	Each	\$9,970.25
TOTAL DIRECT COSTS				
Indirect Costs				<i>None</i>
TOTAL ESTIMATED PROJECT COSTS				\$241,435.89

Budget Narrative

Salary and Wages - SSWD staff will be responsible for the removal of the existing radial gates and expanding the existing metal walkway over the weir to keep the gates control pedestal, remote mounted masts, solar panels, batteries, and RTU processors out of the water. Hourly wages were calculated based on yearly salary by the finance department and quantity of time dedicated to the project was determined based on previous experience as well as conversations with other entities who have implemented similar projects.

Water Tender One will be responsible for helping remove existing gates, pouring cement needed for the headwall, and expanding the existing metal walkway to accommodate the necessary equipment. $\$25.66/\text{hr} * 30 \text{ hours} = \769.8

Water Tender Two will be responsible for helping remove existing gates, pouring cement needed for the headwall, and expanding the existing metal walkway to accommodate the necessary equipment. \$23.43/hr* 30 hours = \$702.9

The *Equipment Operator* will be responsible for the safe operation of all equipment necessary to remove and install the radial gates and expanding the existing metal walkway to accommodate the necessary equipment. \$21.80/hr* 18 hours = \$392.4

Fringe Benefits - Not applicable.

Travel - Not applicable.

Equipment - Not applicable. SSWD owns the necessary equipment (cement buggy and tools) to implement the project.

Materials and Supplies - SSWD will need to purchase rebar and concrete to support the installation of the new Rubicon gates. An estimated 340 ft of rebar is needed at \$0.6/foot totaling \$204. The district estimates needing 356 80lb bags of concrete priced at \$4.28/bag totaling \$1,523.68.

To expand the existing walkway above the weir to accommodate the necessary remote automation equipment, the district will purchase angle iron, serrated bar grating, and channel tubing. An estimated 125 ft of angle iron is needed at \$2.56/foot totaling \$317.5. To expand the walkway, 4 serrated bar gratings at \$410.59 each will be needed, totaling \$1,642.36. An estimated 30 ft of channel tubing is needed at \$1.90/foot totaling \$57.

Contractual - SSWD received quotes from two vendors to estimate the cost to implement the Main Diversion Modernization Project.

Rubicon Waters' quote is \$144,560. It includes replacing the current radial gate with a combination of Rubicon SlipMeters. The selected models would be SMB-1500-6000 and there would be 3 of them in parallel. The units are self-contained in a complete solution including gates, built-in Sonaray flow measurement, actuator mechanism, control pedestal, remote mounted masts, solar panels, batteries, and RTU processor. The package will also include an upstream open-air water-level sensor. Rubicon will be responsible for the installation of the external frame, supervision of dropping the gate/meter into the frame, wiring the control pedestal to a meter, and commissioning and training SSWD staff in the operation and maintenance of the meter. Please see Appendix G for quote specifics.

Dauids Engineer's quote is \$81,296 to provide field site visits, preliminary and design services, construction oversight, and a customized SCADA solution. The field site visit is necessary to gather information relevant to facilitate design services. Preliminary design will include development of preliminary design drawings and completion of a Basis of Design Report (BOD). Final design will consider the comments and revisions suggested by SSWD. DE will provide on-site oversight of construction including rebar inspection and form work prior to concrete being poured and the expansion of the metal walkway to hold necessary equipment above the weir. Following the installation of the SlipMeters, Davids Engineering will set up an operational and integrated SCADA System. DE will install SCADA equipment on-site and integrate the Rubicon

When was the water delivery system constructed?

The existing Radial gate was installed between 1954-1964 and made its first water delivery in 1964.

Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)?

The proposed project replaces the current radial gate (installed in the 1950s) with a combination of Rubicon SlipMeters, located at 39°02'30"N 121°19'54"W. The selected models would be SMB-1500-6000 and there would be 3 of them in parallel. The units are self-contained in a complete solution including gates, built-in Sonaray flow measurement, actuator mechanism, control pedestal, remote mounted masts, solar panels, batteries, and RTU processor. The package will also include an upstream open air water level sensor. The existing concrete diversion structure will be retrofitted by creating reinforced concrete bays capable of accepting the Rubicon SlipMeters.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

There are no historic buildings, structures, or features within 0.5 miles of the project that are listed or eligible for listing on the National Register of Historic Places.

Are there any known archaeological sites in the proposed project area?

There are no known archaeological sites in the proposed project area.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

The proposed project will not impact low-income or minority populations.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

The proposed project will not impact sacred sites or tribal lands.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native species known to occur in the area?

This project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

Required Permits or Approvals

SSWD does not anticipate the need for any permits or approvals as part of this project.

Unique Entity Identifier and System for Awards Management

The registration for South Sutter Water District, Inc / 009825522 / G8T9LN66EA7 / 9A0P4 is active in the U.S. federal government's System for Awards Management (SAM) as of March 25, 2022.

Official Resolution

Resolution No 2022-02
South Sutter Water District

RESOLUTION AUTHORIZING THE SUBMITTAL OF A FINANCIAL ASSISTANCE APPLICATION TO THE BUREAU OF RECLAMATION FOR INSTALLING 3 CONTROL GATES WITH PRECISION FLOW METERS AND SUPERVISORY CONTROL DATA ACQUISITION (SCADA) SYSTEMS; AUTHORIZING THE BOARD OF DIRECTORS TO EXECUTE ALL NECESSARY APPLICATION DOCUMENTS; AND AUTHORIZING THE SUBMISSION OF THIS APPLICATION

WHEREAS, South Sutter Water District desires to improve water monitoring and management of its entire service area; and

WHEREAS, the Project involved installing three control gates with precision flow meters and Supervisory Control Data Acquisition systems (SCADA) on the main canal water diversion point located in the Bear River at Camp Far West Dam and Reservoir; and

WHEREAS, South Sutter Water Districts' Agricultural Water Management Plan and the North American Subbasin Groundwater Management Plan recognizes the need to monitor and manage water efficiently; and

WHEREAS, the U.S. Bureau of Reclamation (USBR) has announced the availability of funds for small-scale water efficiency projects through FY 2022 WaterSMART Grants: Small-Scale Water Efficiency Projects; and

WHEREAS, said funding is intended to conserve and use water more efficiently; mitigate conflict risk in areas at a high risk of future water conflict; and accomplish other benefits that contribute to water supply reliability in the western United States; and

WHEREAS, said funding includes grants at reasonable terms; and

WHEREAS, South Sutter Water District will comply with all applicable laws and regulations relating to the project, including NEPA prior to implementation of the Project; and

WHEREAS, various documents are required to be filed with the USBR related to the FY 2022 WaterSMART Grants: Small-Scale Water Efficiency Projects application.

NOW, THEREFORE, BE IT RESOLVED:

1. That the Board of Directors authorized the submittal of a financial assistance application with the USBR for the control gates with precision flow meters and SCADA system expansion project.
2. That the Board of Directors President is authorized to sign all necessary Project application documents.
3. That the Board of Directors supports the grant application.

I, Bradley J. Arnold, General Manager/Secretary, hereby certify that I am and at all times mentioned herein have been the qualified and acting Secretary of South Sutter Water District, a District organized and existing under and by virtue of the laws of the State of California; that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the Board of Directors of said District duly held on the 31st day of March, 2022, a majority and quorum of the members of said Board being present and all voting in favor of said Resolution; and that said Resolution has not been modified, rescinded, altered, or amended and is now in full force and effect.

AVES:

NOES:

WITNESS my hand this 31st day of March, 2022



Bradley J. Arnold, General Manager/Secretary
SOUTH SUTTER WATER DISTRICT



Appendix C: Letters Of Support



DeVALENTINE ORCHARDS, INC. • 2890 BEAR RIVER DRIVE • RIO OSCO, CA 95674 • (530) 633-0617 • dvooffice@gmail.com

April 19, 2022

Bureau of Reclamation Water Resources and Planning Office
Ms. Robin Graber
Mail Code: 86-6300
P.O. Box 25007
Denver, CO 80225
rgraber@usbr.gov

Re: Support of South Sutter Water District's Application for WaterSMART Small-Scale Water Efficiency Grant: Rubicon SlipMeter Installation Project

Dear Ms. Graber,

DeValentine Orchards, Inc. is pleased to voice support for the South Sutter Water District's (SSWD) proposal for funding from the U.S. Bureau of Reclamation for their Rubicon SlipMeter installation project.

The South Sutter Water District's Rubicon SlipMeter installation project is a critical component of SSWD's modernization plans and will significantly improve the management of SSWD's irrigation conveyance system resulting in improved water efficiency and enhanced water conservation. The project will retrofit SSWD's main diversion works with three Rubicon SlipMeters and implement SCADA to provide remote monitoring and control of the Rubicon SlipMeters that will control waterflow rates. Currently, SSWD does not have flow meters in place to accurately measure water flow through the canal. Due to the remote nature of the gate, SSWD operators must travel 20 miles to and from the main office to manually raise and lower the existing gate to adjust the diversion rate. By modernizing the existing conveyance equipment, SSWD will gain access to accurate flow measurements, automated flow controls, and thus be able to flexibly and responsively adjust flow rates to match the downstream demands thereby only releasing water from their reservoir as needed. This project will help the water district adapt to and mitigate the effects of climate change while being mindful stewards of water resources during a prolonged drought.

As a third-generation landowner and farmer in SSWD, my operation depends on the water provided by the district. DeValentine Orchards strongly supports efforts by the district to modernize and improve efficiency. These improvements will allow the district to better serve its stakeholders, thereby positively impacting our local economy, as well as conserve water.

Thank you for considering South Sutter Water District's Rubicon SlipMeter Installation Project for U.S. Bureau of Reclamation funding.

Sincerely,

Ashley DeValentine McKenzie
Owner/Officer, DeValentine Orchards Inc.

April 11, 2022

Bureau of Reclamation Water Resources and Planning Office
Ms. Robin Graber
Mail Code: 86-6300
P.O. Box 25007
Denver, CO 80225
rgrabier@usbr.gov

Re: Support of South Sutter Water District's Application for WaterSMART Small-Scale Water Efficiency Grant: Rubicon SlipMeter Installation Project

Dear Ms. Graber,

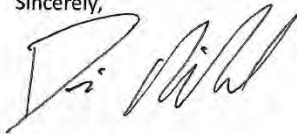
Dennis Michel is pleased to voice support for the South Sutter Water District's (SSWD) proposal for funding from the U.S. Bureau of Reclamation for their Rubicon SlipMeter installation project.

The South Sutter's Water District's Rubicon SlipMeter installation project is a critical component of SSWD's modernization plans and will significantly improve the management of SSWD's irrigation conveyance system resulting in improved water efficiency, and enhanced water conservation. The project will retrofit SSWD's main diversion works with three Rubicon SlipMeters and implement SCADA to provide remote monitoring and control of the Rubicon SlipMeters that will control waterflow rates. Currently, SSWD does not have flow meters in place to accurately measure water flow through the canal. Due to the remote nature of the gate, SSWD operators must travel 20 miles to and from the main office to manually raise and lower the existing gate to adjust the diversion rate. By modernizing the existing conveyance equipment, SSWD will gain access to accurate flow measurements, automated flow controls, and thus be able to flexibly and responsively adjust flow rates to match the downstream demands thereby only releasing water from their reservoir as needed. This project will help the water district adapt to and mitigate the effects of climate change while being mindful stewards of water resources during a prolonged drought.

Implementing this project would greatly enhance the District's ability to consistently deliver water accurately to the growers. As a farmer, reliable and consistent water delivery is crucial to my business. Having accurate flow measurement in our main canal will not only help ensure that, but it will greatly reduce loss at the end of our system which is crucial in water years such as this one.

Thank you for considering South Sutter Water District's Rubicon SlipMeter Installation Project for U.S. Bureau of Reclamation funding.

Sincerely,



Dennis Michel
Michel Farms
3259 Michel Rd
Nicolaus, CA 95659
dm95659@yahoo.com
(530) 701-4375

Double D Farms

838 Shetland Court, Lincoln, CA 95648

April 20, 2022

Bureau of Reclamation Water Resources and Planning Office

Ms. Robin Graber

Mail Code: 86-6300

P.O. Box 25007

Denver, CO 80225

rgraber@usbr.gov

Re: Support of South Sutter Water District's Application for WaterSMART Small-Scale Water Efficiency Grant: Rubicon SlipMeter Installation Project

Dear Ms. Graber,

Double D Farms is pleased to voice support for the South Sutter Water District's (SSWD) proposal for funding from the U.S. Bureau of Reclamation for their Rubicon SlipMeter installation project.

The South Sutter Water District's Rubicon SlipMeter installation project is a critical component of SSWD's modernization plans and will significantly improve the management of SSWD's irrigation conveyance system resulting in improved water efficiency and enhanced water conservation. The project will retrofit SSWD's main diversion works with three Rubicon SlipMeters and implement SCADA to provide remote monitoring and control of the Rubicon SlipMeters that will control waterflow rates. Currently, SSWD does not have flow meters in place to accurately measure water flow through the canal. Due to the remote nature of the gate, SSWD operators must travel 20 miles to and from the main office to manually raise and lower the existing gate to adjust the diversion rate. By modernizing the existing conveyance equipment, SSWD will gain access to accurate flow measurements, automated flow controls, and thus be able to flexibly and responsively adjust flow rates to match the downstream demands thereby only releasing water from their reservoir as needed. This project will help the water district adapt to and mitigate the effects of climate change while being mindful stewards of water resources during a prolonged drought.

I have been farming rice in this area for over 20 years. I also serve on our local water board for South Sutter Water District. Due to the recent droughts, I feel it is extremely important for both my farming operation and for South Sutter Water District to have a better way to manage water flows which would help conserve water. Water efficiency is critical to sustainable farming.

Thank you for considering South Sutter Water District's Rubicon SlipMeter Installation Project for U.S. Bureau of Reclamation funding.

Sincerely,

Jason Dunbar

Partner

Double D Farms

doubledrice@gmail.com

916.825.8250

Gallagher Ranch Inc.

1998 Pleasant Grove Rd
Rio Oso, CA 95674
(530)-633-4348

April 11, 2022

Bureau of Reclamation Water Resources and Planning Office
Ms. Robin Graber
Mail Code: 86-6300
P.O. Box 25007
Denver, CO 80225
rgraber@usbr.gov

Re: Support of South Sutter Water District's Application for WaterSMART Small-Scale Water Efficiency Grant: Rubicon SlipMeter Installation Project

Dear Ms. Graber,

Gallagher Ranch is pleased to voice support for the South Sutter Water District's (SSWD) proposal for funding from the U.S. Bureau of Reclamation for their Rubicon SlipMeter installation project.

The South Sutter Water District's Rubicon SlipMeter installation project is a critical component of SSWD's modernization plans and will significantly improve the management of SSWD's irrigation conveyance system resulting in improved water efficiency and enhanced water conservation. The project will retrofit SSWD's main diversion works with three Rubicon SlipMeters and implement SCADA to provide remote monitoring and control of the Rubicon SlipMeters that will control waterflow rates. Currently, SSWD does not have flow meters in place to accurately measure water flow through the canal. Due to the remote nature of the gate, SSWD operators must travel 20 miles to and from the main office to manually raise and lower the existing gate to adjust the diversion rate. By modernizing the existing conveyance equipment, SSWD will gain access to accurate flow measurements, automated flow controls, and thus be able to flexibly and responsively adjust flow rates to match the downstream demands thereby only releasing water from their reservoir as needed. This project will help the water district adapt to and mitigate the effects of climate change while being mindful stewards of water resources during a prolonged drought.

The Gallagher family has been farming in the South Sutter Water District for over 150 years and we currently operate 3,400 acres of rice ground and 400 acres of tree crops in the district. Water conservation and efficiency has always been a huge priority in our farming operation. We are constantly searching for new practices and technology to help track our water consumption and make sure that we are using all of our resources efficiently. I believe this project that the district is pursuing would significantly improve the overall management and accuracy of our water resources. Modernization of the conveyance equipment in SSWD is something that has been lacking for several years now and this project would be a huge step in the right direction.

Thank you for considering South Sutter Water District's Rubicon SlipMeter Installation Project for U.S. Bureau of Reclamation funding.

Sincerely,



Jeff Gallagher
Gallagher Ranch
Gallagherranch@gmail.com
530-510-0340