



— BUREAU OF —
RECLAMATION

GCID



GLENN-COLUSA IRRIGATION DISTRICT

Glenn-Colusa Irrigation District

Water Efficiency Improvement Project

Applicant Contact:

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Technical Proposal and Evaluation Criteria

Executive Summary

Applicant Information

Application Date: 11/12/24

Applicant Name: Glenn-Colusa Irrigation District

City, County, State: Willows, Glenn and Colusa Counties, California

Project Manager:

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Requested Reclamation Funding: \$721,196; **Total Project Cost:** \$1,442,392

Applicant Category: Category A (Irrigation District)

Project Summary

Provide a one paragraph project summary that provides the location of the project, a brief description of the work that will be carried out, any partners involved, expected benefits and how those benefits relate to the water management issues you plan to address.

Glenn-Colusa Irrigation District (GCID or the District) is the largest irrigation district in California's Sacramento Valley and provides water to more than 140,000 acres of farmland through a complex open-channel irrigation system. GCID diverts water from the Sacramento River at a pumping station near Hamilton City, CA and conveys the water southward via a 65-mile long Main Canal, which feeds more than 608 miles of open laterals and 534 miles of drains. Flow control and flow measurement along the Main Canal is largely automated and integrated into the District's SCADA system. However, operation of the District's vast system of laterals and drains is almost entirely manual and has very limited automated measurement. The lack of automated flow control and measurement information in the system of laterals and drains results in the significant over-delivery and excess spill of irrigation water. The proposed project will install automated and SCADA integrated in-lateral water control structures, spill structures, and measurement devices at the locations within the District's system of laterals and drains that will yield the greatest operational benefit and water savings. Based on the available water delivery information for the specific project locations and the operational efficiency improvements typical of the type of flow control and measurement infrastructure to be installed, GCID expects to conserve 4,366 acre-feet of water in a typical year as a result of the project.

The Project will commence soon after the anticipated award date of October 31, 2025 and will conclude prior to October 31, 2028.

The project is not located on a Federal Facility.

Project Location

Provide detailed information on the proposed project location or project area, including a map showing the geographic location.

Glenn-Colusa Irrigation District's boundary is within Glenn and Colusa counties on the west side of the central portion of the Sacramento Valley. The District's main office is located in Willows, CA, approximately 80 miles north of Sacramento. Work sites included in the proposed project are in both Glenn and Colusa Counties. See the figures that follow on pages 5 through 11 for the project area and project sites on each lateral.

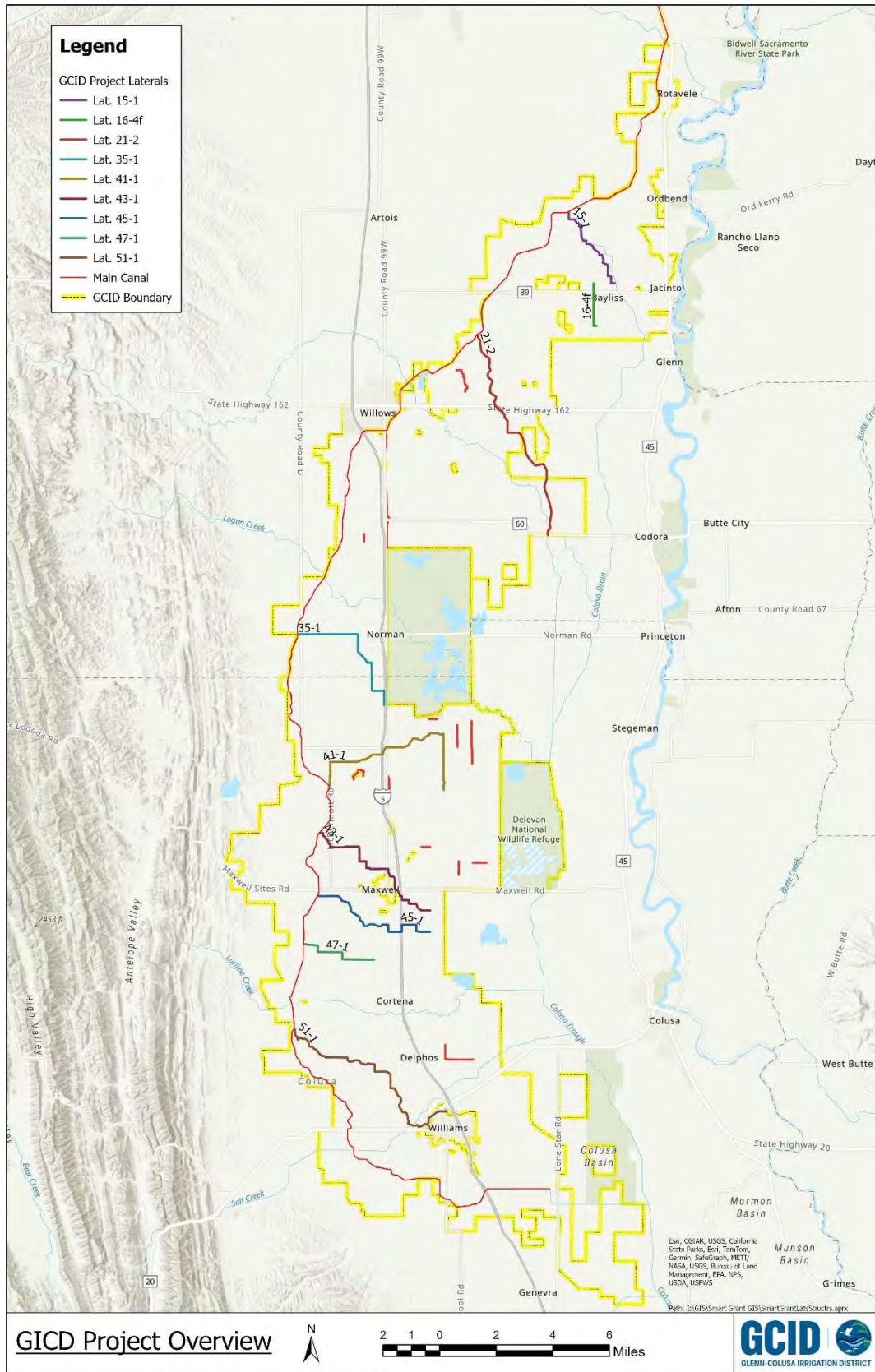


Figure 1 GICD Project Area Overview

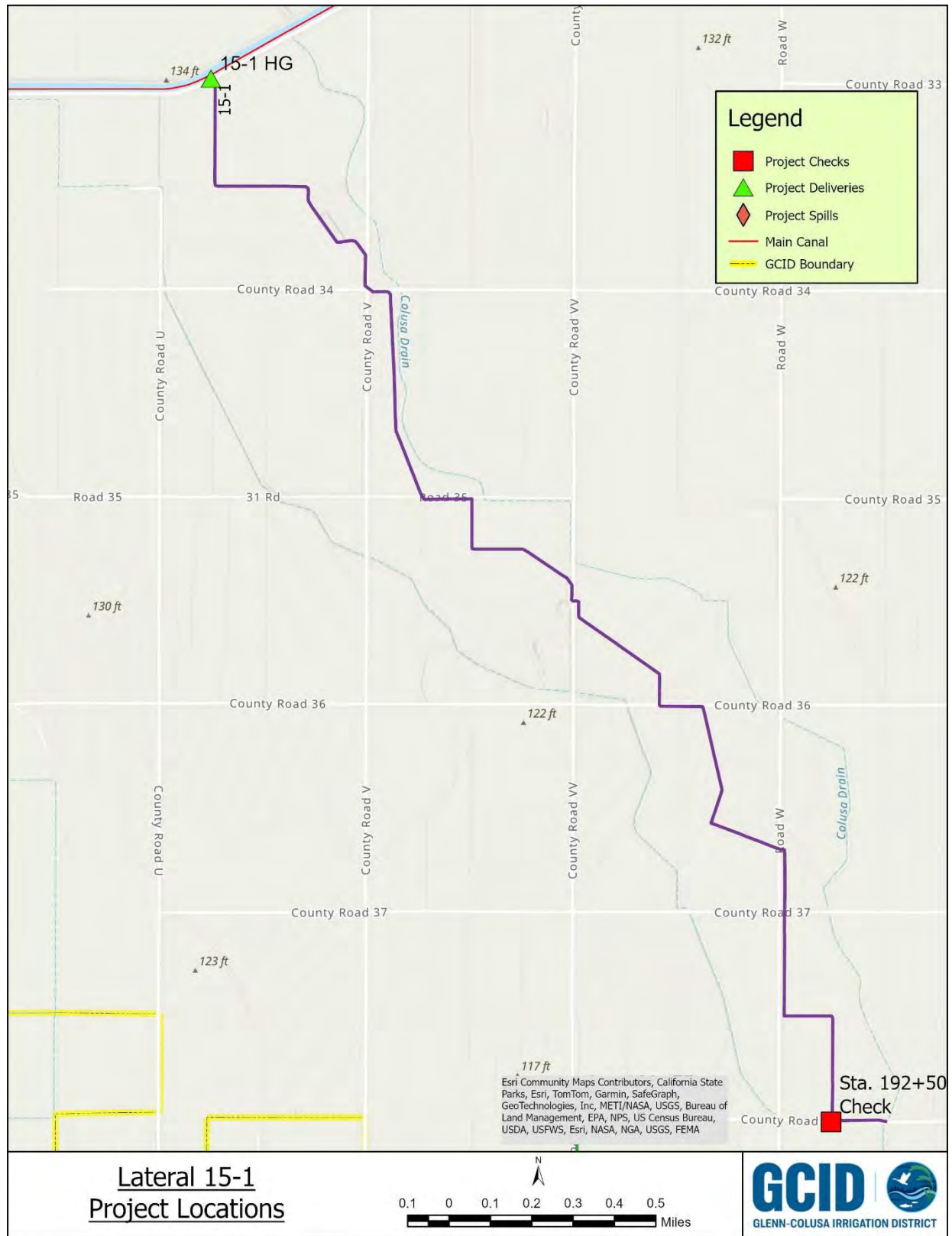


Figure 2 Project Locations: Lat 15-1



Figure 3 Project Locations: Lat 16-4f

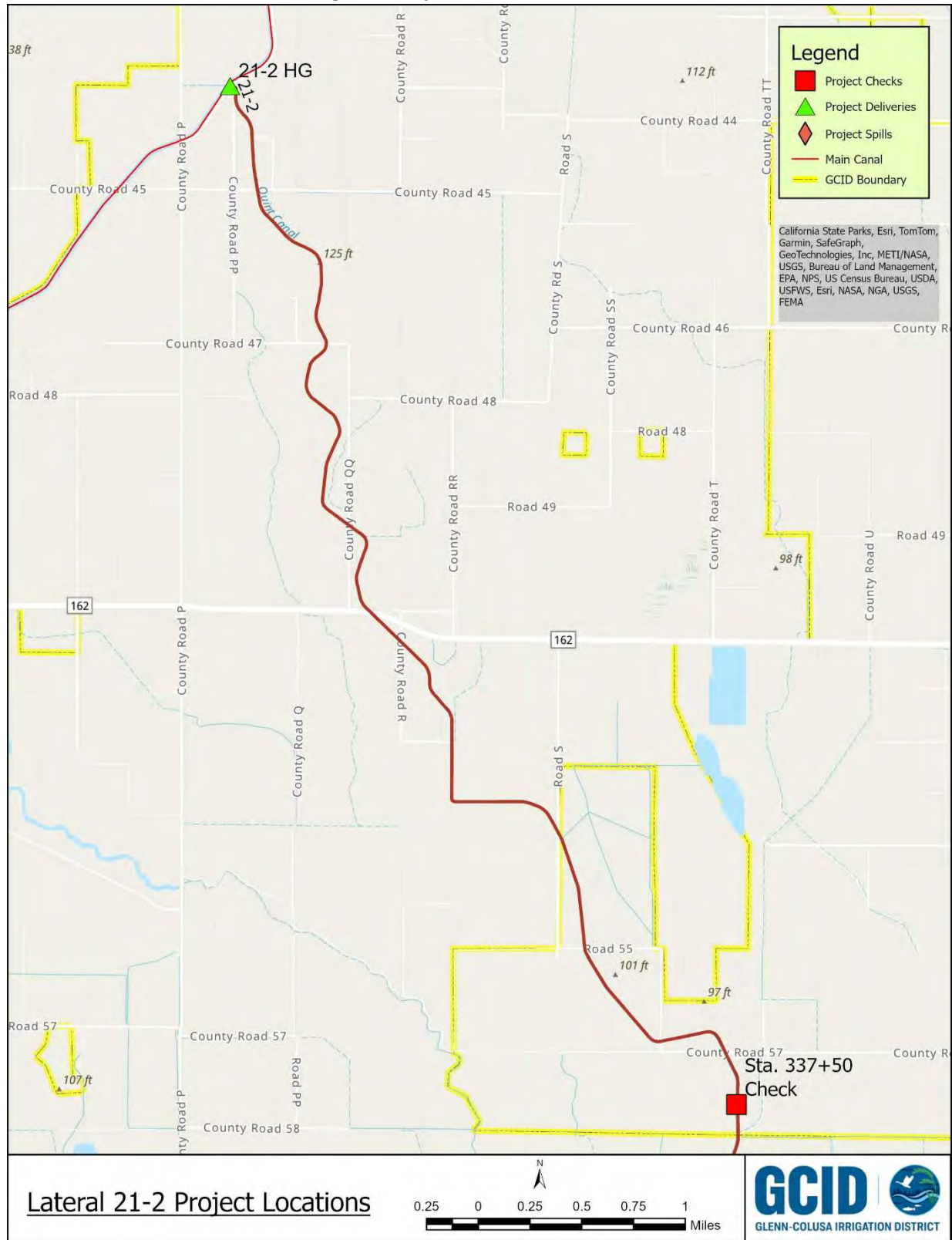


Figure 4 Project Locations: Lat 21-2



Figure 5 Project Locations: Lat 35-1



Figure 6 Project Locations: Lat 41-1



Figure 7 Project Locations: Lat 43-1

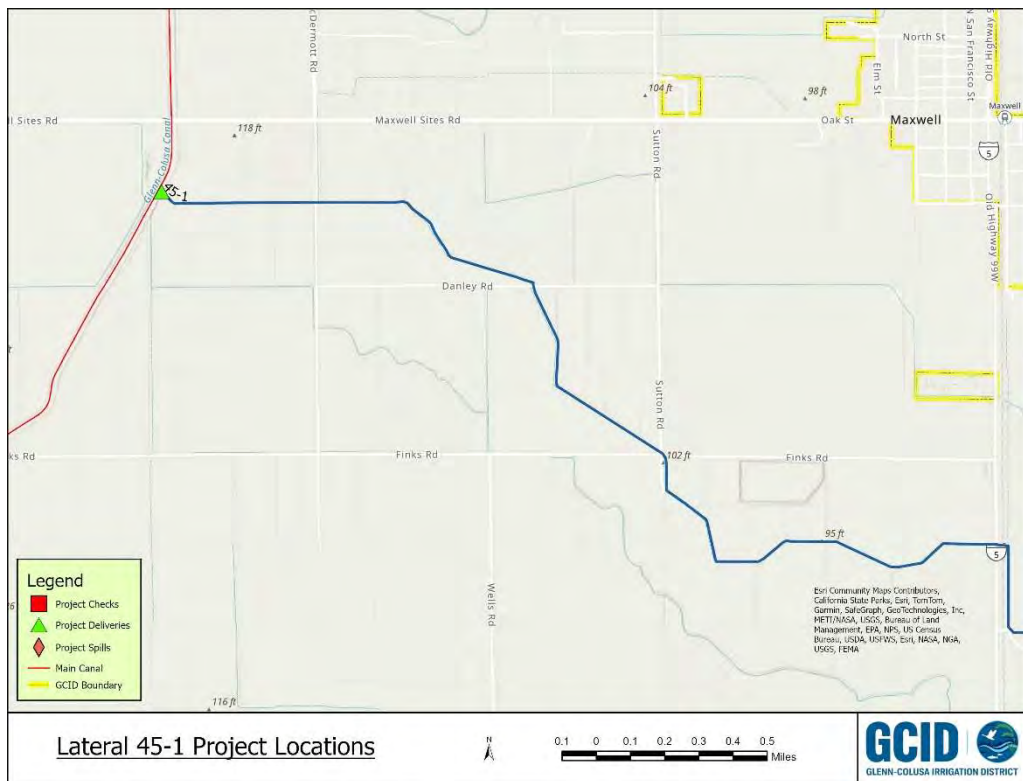


Figure 8 Project Locations: Lat 45-1

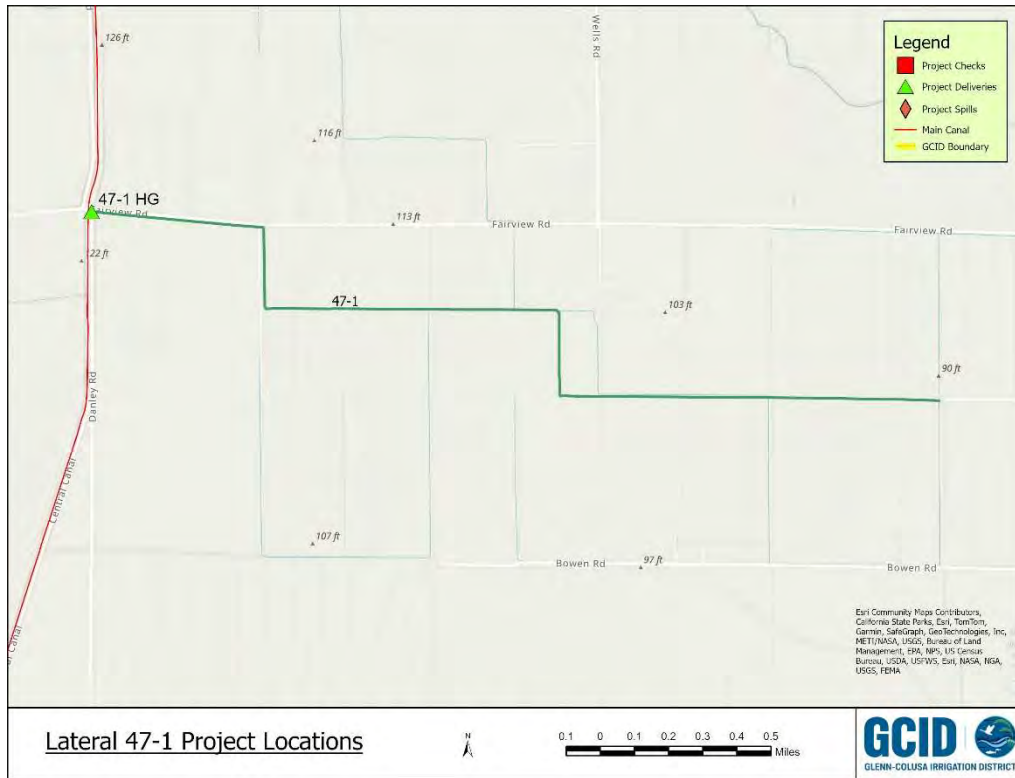


Figure 9 Project Locations: Lat 47-1



Figure 10 Project Locations: 51-1

Technical Project Description

Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work.

This project proposes three different categories of work to be performed, though each category of work is focused on automated flow control and measurement, as described below:

- Installation of automated in-lateral water control structures.
- Installation of automated spill structures.
- Installation of lateral headgate measurement devices.

Installation of Automated In-Lateral Water Control Structures – February/March 2025

This portion of the project includes installing six (6) Rubicon FlumeGates, three (3) Rubicon SlipMeters, and two (2) Rubicon PikoMeters at locations in Lateral 16-4f. Lateral 16-4f has been selected for these improvements due to the condition of existing water control structures and the sensitivity to input changes (such that improvements will yield significant operational improvements). The gates specific to each site were chosen by Rubicon staff based on site requirements. A description of FlumeGates, SlipMeters, and Pikometers and their intended operation can be found in Appendix B (page 63). Additionally, a Rubicon Weather Station will be included on one of the FlumeGate structures. The concrete structures that the Rubicon gates will be installed in are existing concrete structures within the District, as in the example in Figure 11.



Figure 11. Existing Weir Structure on Lateral 16-4f

At each location, installation of the six (6) FlumeGates will consist of three (3) to four (4) employees plus the Rubicon Field Technician aligning a premade track and frame inside the

concrete structure, drilling six (6) to eight (8) ½-inch holes through the concrete on both vertical walls and floor. Anchor bolts will be installed to affix the track and frame in a predetermined location of the concrete control structure. Once the track and frame are secured, the gate will be lowered into place by a crane or like equipment, attached to the framework and the battery operated control pedestal and solar panel pole will be attached to the top of the frame or concrete pad providing constant power. The Rubicon field technicians will then survey and confirm all gates are set to the correct level for proper operation. The gate will be fully operational once Sierra Controls (the District's SCADA integrator) ensures the controls are active and controlled by SCADA.

The installation of the three (3) Pikometers and two (2) Slipmeters will involve the removal of already existing Waterman slide gates by unbolting them from the headwall, removing them and drilling eight (8) new half inch holes and installing anchor bolts that will hold the automated gates in place. Once the anchor bolts are in place, sealant will be applied to the back side of the gate and it will be bolted to the headwall. A battery-operated control pedestal will be mounted to the side of the concrete headwall with a solar panel pole to recharge the battery components.

Installation of Automated Spill Structures – June/ July 2025-2027

This portion of the project includes the installation of eight (8) automated and SCADA integrated spill structures (Rubicon FlumeGates) along and at the end of five (5) District laterals. Additionally, two (2) of the FlumeGates will be equipped with a Rubicon Weather Station. A product description is provided in Appendix B, starting on page 63. Currently, the District has no automated spill structures. To understand the volume of water spilling from a lateral, District staff currently must drive to the specific spill location and take a manual measurement. Because of the significant size of the District and the considerable number of spill locations, a very significant portion of water operations staff time is spent driving to spill locations to observe conditions there, manually adjusting the height of the spill structure, then driving up the lateral to make related adjustments in other flow and level control structures.

By automating the spill locations, the volume of water unintentionally spilled will be significantly reduced. Additionally, staff will have much more time to focus on field-level water delivery adjustments, which will further improve operational efficiency.

Each spill location has an existing spill structure with no automation. Four (4) out of the eight (8) locations need to have the existing structure removed due to the condition of the structure, as shown in *Figure 12*. The remaining four will be retrofitted, using the existing structure, to fit the FlumeGate requirements. District staff will operate excavators with jack hammers to demolish the four (4) structures, load the broken concrete into dump trucks and transport away from the site. These four (4) spill locations will then be replaced with a cast-in-place structure. District

staff will conduct all engineering and construction processes. Excavation of a 30 by 30 foot area to a predetermined grade, subgrade elevation met with the construction of a 15 by 15 foot compacted gravel (3/4 aggregate base rock) pad. A 10-inch concrete floor with 2-foot curtain walls will be formed and poured first, followed by a pair of vertical “L” shaped walls combined with a spill box. This will be the foundation of the structure supporting the FlumeGates.



Figure 12. Existing Spill Structure on Lateral 41-1.

Installation of the FlumeGates will consist of three (3) to four (4) employees plus the Rubicon Field Technician aligning a premade track and frame inside the concrete structure, drilling six (6) to eight (8) ½ -inch holes through the concrete on both vertical walls and floor. Anchor bolts will be installed to affix the track and frame in a predetermined location of the concrete control structure. Once the track and frame are secured the FlumeGate will be lowered into place by a crane or like equipment, the framework and the battery-operated control pedestal and solar panel pole will be attached to the top of the frame providing constant power. The Rubicon Field Technician will then survey and confirm all gates are set to the correct level for proper operation. The gate will be fully operational once Sierra Controls ensures the controls are active and controlled by SCADA.

Installation of Automated Lateral Headgate Measurement Devices – February/March 2025-2027

This portion of the project will include SCADA integrated measurement devices (ten (10) Mace Doppler Ultrasonic Inserts and one (1) Sontek Sidelooker) at eight (8) District lateral headgate sites. Currently, the District only has one lateral headgate with continuous measurement, shown in *Figure 13*, which is similar to the proposed Mace Insert measurement system. Installing the eight (8) additional headgate measurement devices will provide District staff with a greatly

expanded understanding of the water usage in this portion of the lateral system. The lateral headgates where the measurement devices are to be installed are the same laterals where the automated spill structures are being installed. Gaining automated flow measurements at both the beginning and end of the laterals will significantly reduce both irrigation water over deliveries and excess spills. A description of the Mace Doppler Insert Velocity Sensor and Sontek SideLooker are highlighted in Appendix B, page 63, with their corresponding brochures.



Figure 13. Existing SCADA Integrated Headgate Measurement Site at Lateral 25-1

Installation of the Mace Insert requires a section of the existing pipe to be exposed towards the downstream end by using an excavator to excavate an approximately seven foot by seven foot hole with 2:1 sloped banks. This will allow SCADA personnel to drill a hole in the pipe and install a stainless-steel curved plate and the measurement device. Once the device has been installed a 42-inch manhole will be installed directly over the measurement device and concreted in place, allowing for serviceability and maintenance of the device. The hole will be backfilled and compacted to original bank height and a lid installed over the manhole for safety.

Installation of the Sontek SideLooker requires an existing concrete section (roughly 20 feet long) downstream of the outlet, where a metal frame will be installed. The SideLooker device mounts on to the frame followed by a cable within the laterals section. GCID currently has a few sites within the District with a similar configuration as proposed which is shown in *Figure 14*.



Figure 14. Existing GCID Sontek SL out of the water.

Using an excavator, the District staff will create a trench to bury conduit from each device to the control cabinet. A Senix ultrasonic sensor and a pressure transducer sensor will be installed near the outlet of the pipe to ensure the pipe stays full during operation as required for the accurate functioning of the Mace sensor. At the location of the control cabinet, a four foot by four foot by six inch concrete pad will be poured for the foundation of vertical metal pipes, which will connect to the control cabinet. District staff will build and install all components of the control panel, including the antenna and cellular router. District SCADA technicians will customize logic programming for each site which will then be shared with Sierra Controls to integrate into the existing SCADA system.

Once all sites are integrated into the Districts' SCADA system, Water Department Supervisors and other District staff will ensure all devices are working efficiently to ensure flexibility and accuracy which will result in water savings throughout the District. In addition, the weather station feedback will be included on the District website for landowners to access as needed.

Approach to Complete the Work

To ensure that the work does not have adverse impacts, the District will undertake the following measures as part of the project, in addition to any additional measures identified as part of the District's compliance with the California Environmental Quality Act (CEQA):

Conservation Measure 1: Implement Erosion and Spill Control Measures.

To ensure that contaminants are not accidentally introduced into irrigation ditches and canals, the following measures will be implemented during construction of the project:

- Use of BMPs (e.g., filter fabric or sandbags) to prevent pollutants from entering drainage channels
- Equipment be inspected daily for leaks or spills
- Materials for cleanup of spills be available on site
- Flammable materials be stored in appropriate containers
- Spill prevention kits be in close proximity when using hazardous materials
- Spills and leaks be cleaned up immediately and disposed of in accordance with local, state, and federal regulations
- Vehicles and equipment be kept clean
- Construction personnel to be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills

Conservation Measure 2: Implement General Biological Resources Protection Measures during Project Construction.

The District shall implement the following general biological resources protection measures during project construction:

- Limit construction and operations activities to daylight hours to the extent feasible. If nighttime activities are unavoidable, then workers shall direct all lights for nighttime lighting into the work area and shall minimize the lighting of any natural habitat areas adjacent to the work area.
- Vegetation clearing will be limited to only those areas necessary for construction.
- Cleared vegetation and soils will be disposed at a location that will not adversely effect special status wildlife species.
- Dispose of food-related and other garbage in wildlife-proof containers and remove the garbage from the project area daily during construction. Vehicles carrying trash will be required to have loads covered and secured to prevent trash and debris from falling onto roads and adjacent properties.
- Store all construction-related vehicles and equipment in designated staging areas. These areas shall not contain native or sensitive vegetation communities and shall not support sensitive plant or wildlife species.

- Construction-related vehicles and equipment will not exceed a 20 mile-per-hour speed limit at the construction sites, staging areas, or on unpaved roads.
- The qualified biologist will provide construction personnel with worker environmental awareness training.
- Prior to the initiation of work each day, the District will inspect construction pipes, culverts, or similar features; construction equipment; or construction debris left overnight in areas that may be occupied by special-status species that could occupy such features prior to being used for construction.
- Avoid wildlife entrapment by completely covering or providing escape ramps for all excavated steep-walled holes or trenches more than 1 foot deep at the end of each construction work day. The qualified biologist shall inspect open trenches and holes and shall remove or release any trapped wildlife found in the trenches or holes prior to filling by the District.

Capture and relocation of trapped or injured wildlife listed under ESA or CESA can only be performed by personnel with appropriate state and/or federal permits.

Conservation Measure 3: Conduct Desktop Special Status Wildlife Species.

Prior to implementing a project that involves grading, vegetation removal, or other form of construction in irrigation and drainage canals or upland areas outside of established agricultural croplands with a history of discing, planting, and maintenance, a qualified biologist will conduct a desktop evaluation of the site using digital web-based aerial photography. The purpose of the desktop evaluation will be to determine the potential for special status wildlife and plant species habitat to occur on site. A qualified biologist will also perform a review of the USFWS Information for Planning and Consultation, CNDDDB, CNPS, and Calflora databases to identify known records or potential for special status species to occur in the project vicinity. If through this assessment, the biologist determines that potential habitat for special status wildlife exist, then site-specific survey(s) will be conducted per Conservation Measures 4, 5 or 6, as applicable.

Conservation Measure 4: Conduct Special Status Wildlife Species Surveys and Avoidance.

If the desktop site survey indicates that a project site provides habitat for special-status wildlife, site-specific pre-construction surveys and avoidance measures will be conducted by a qualified biologist, in accordance with Conservation Measures 5, 6 and 7. Setback areas will be flagged. A qualified biologist shall be present during construction to monitor construction activities.

Conservation Measure 5: Implement GGS Avoidance Measures.

If the need for a project site survey is identified, and the initial assessment indicates that the project site provides habitat for giant garter snake (GGS), avoidance measures will be implemented to avoid GGS during construction. Construction activities within GGS habitat will be restricted to between May 1 and October 1, to the extent feasible. If work must be conducted within GGS habitat between October 2 and April 30, a pre-construction survey will be conducted in any area within 200 feet of GGS aquatic habitat by a qualified biologist within 24 hours prior to the onset of construction. If GGS is found in the project area, then to avoid direct impacts on GGS, the following measures will be implemented during construction of the project:

- Suitable temporary fencing (acceptable to USFWS and/or CDFW) will be installed to exclude GGS from the work area.
- Fence installation will be supervised by a qualified biologist.
- The qualified biologist will provide worker environmental awareness training, including instructing construction personnel on how to inspect the exclusion fence.
- Prior to the initiation of work each day, the contractor will inspect the exclusion fence to ensure it is functional for the intended purpose. If GGS is observed within the temporary fencing around the construction site, the District will stop work and allow the species to leave the site of its own volition or the snake will be captured by a qualified biologist with appropriate collecting/handling permits and relocated to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status species is prohibited without appropriate permits from the USFWS and CDFW.

Conservation Measure 6: Implement Western Spadefoot Avoidance Measures.

If the need for a project site survey is identified, and the initial assessment indicates that that western spadefoot are present, avoidance measures must be implemented to avoid western spadefoot during construction.

- If western spadefoot is observed within the work before the giant garter snake exclusion fence is installed, a qualified biologist will conduct a pre-activity clearance survey each day and remain onsite to oversee all vegetation clearing and ground disturbing activities until the individual(s) have vacated the work areas. If western spadefoot is detected, the biologist will stop work and allow the species to leave the work area of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area.

Conservation Measure 7: Implement Northwestern pond turtle Avoidance Measures.

If the need for a project site survey is identified, and the initial assessment indicates that the project site provides habitat for northwestern pond turtle, avoidance measures must be implemented to avoid northwestern pond turtle during construction.

- **Pre-Construction Survey and Avoidance Buffers:** Within seven (7) days prior to the start of construction within the work area, a qualified biologist (someone who is able to identify this species) will conduct a pre-construction survey for northwestern pond turtle within the work area, and all accessible areas within up to 330 feet. Pre-construction surveys will be conducted in accordance with the draft Western Pond Turtle (*Emys marmorata*) Visual Survey Protocol for the Southcoast Ecoregion (United States Geological Survey 2006). If no northwestern pond turtles are observed during the pre-construction survey, then construction activities may begin. If the surveys result in the identification of a northwestern pond turtle, or an individual is found within the work area during construction activities, it will be allowed to leave the work area on its own and the qualified biologist will determine appropriate avoidance buffers to be implemented to avoid impacts to the individual(s).
- **Monitor:** If northwestern pond turtles are observed within the work area before the giant garter snake exclusion fence is installed, a qualified biologist will conduct a pre-activity clearance survey each day and remain onsite to oversee all vegetation clearing and ground disturbing activities until the individual(s) has vacated the work areas. If northwestern pond turtles are detected during construction activities, the biologist will stop work and allow the species to leave the work area of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area.

Evaluation Criteria

Evaluation Criteria A – Quantifiable Water Savings

Describe the amount of estimated water savings. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please include a specific, quantifiable water savings estimate; do not include a range of potential water savings.

- ❖ The District estimates that completion of the proposed projects included in this application will result in an average of approximately 4,366 AF of water being conserved on an annual basis.

The District's irrigation season is from April 1 through October 31 of each year. Data from 2018 to 2021 and 2023 (2022 is excluded as the severe drought conditions present at the time resulted in an anomalously low water supply) show that the District diverts an average of 673,942 AF per irrigation season at its Main Pumping Station, shown in Appendix A, page 62. Of this average total diversion, an average of 145,525 AF is conveyed annually into the 9 laterals where the specific projects included in this grant application are located. These 9 laterals serve 26,591 acres of farmland, most of which is cultivated as rice and irrigated with flood irrigation. The District's most recently completed Agricultural Water Management Plan¹ shows that in a typical year, approximately 30% of District diversions end up as system losses, which for these nine laterals equates to approximately 43,658 AF per irrigation season.

Based on similar projects in other open-channel irrigation systems, the types of water control and measurement improvements proposed in this grant application typically result in reductions in system losses of between 10% and 30%. Appendix C, page 83, includes a case study discussing such water use efficiency improvements. Hence, a conservative estimate of annual water savings is 43,658 AF x 10% = 4,366 AF.

Describe current losses: Please explain where the water that will be conserved is currently going and how it is being used. Consider the following:

- *Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground).*
 - ❖ Losses in the District conveyance system occur through seepage and excess spills. In a typical year, the District will provide irrigation water to approximately 100,000 acres of rice, all of which is flood irrigated, and an additional 26,000 acres of other crops (mostly orchards). Since rice is flood irrigated, a large quantity of water seeps into the ground every year. However, the over-delivery of irrigation water to rice fields results in avoidable excess seepage. By gaining improved water flow control and measurement capacity, over deliveries can be minimized. An average of 145,525 AF is conveyed annually into the 9 laterals where the specific projects included in this grant application are located. These 9 laterals serve 26,591 acres of farmland, most of which is cultivated as rice and irrigated with flood irrigation. Improving flow control and water measurement

¹ Refer to https://www.gcid.net/wp-content/uploads/2023/02/2021_04_13-2020-AWMP-Submittal_2.pdf starting on page 116.

within the lateral system will reduce the over-delivery of agricultural water and result in significantly less excess seepage.

Water that spills along or at the end of a lateral flows through the District's drain infrastructure and is available for recapture and redistribution at certain locations within the District. However, in most years, the volume of water spilled often exceeds the capacity of the District to recapture and redistribute it. Water that is spilled and not recaptured by the District eventually drains to the Colusa Drain and is either diverted by water users downstream of the District or flows back into the Sacramento River at Knights Landing. Though some level of spills is necessary, the proposed project will give the District improved control of the system and significantly reduce avoidable, excess spills. Additionally, the District has limited ability to measure and record the volume of water spilling. Completion of this project will significantly improve the District's ability to monitor the conditions at spill locations, measure and record the spill data, and make operational changes to limit spills to the minimum optimal level.

Ultimately, the project will reduce losses from excess seepage and excess spills and will result in the District reducing diversions from the Sacramento River.

- *If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?*
 - ❖ The majority of losses are from excess seepage due to the over-delivery of water to flood-irrigated fields. Although seepage has some positive impacts through groundwater recharge, the losses the District experiences through excess seepage is not intentional, requiring a diversion much greater than the actual delivery need. Improved measurement and flow control will allow the District to deliver only the water required for healthy cultivation of crops in the project area and to avoid the over-delivery of water.

Two (Laterals 41-1 and 51-1) of the nine laterals recapture a portion of the water spilled to serve growers downstream within the District. One (Lateral 21-2) of the nine laterals spills into a neighboring District. Though spillage at all locations will not be minimized due to alternative uses, the data provided through these project improvements will serve the District and allow the District to make operational changes that limits spills to the minimum optimal level.
- *Are there any other known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?*
 - ❖ The district is not aware of any benefits associated with current losses. All locations are found in highly managed canals that actively feed cultivated land.

Describe the support/documentation of estimated water savings: Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Please be sure to consider the questions associated with your project type when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.

In addition, please note that the use of visual observations alone to calculate water savings, without additional documentation/data, is not sufficient to receive credit under this section. Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.

- ❖ The District has reliable data regarding the volume of water that enters each of the laterals in the conveyance system. On a daily basis, the District's water operators take a flow measurement at each of the lateral headgates where the lateral branches from the Main Canal. These daily readings provide water operations staff with information about system conditions and are stored in a central database. The daily readings are obtained by various measurement devices, including Global Water Velocity Probes, ITRC's Weir Sticks, and David's Engineering RemoteTracker Acoustic Doppler Velocimeters. Additionally, the total volumes entering each lateral are fairly consistent across similar year types.

As stated above, an average of 145,525 AF is conveyed annually into the 9 laterals where the specific projects included in this grant application are located. These 9 laterals serve 26,591 acres of farmland, most of which is cultivated as rice and irrigated with flood irrigation. The flow control and measurement improvements that the proposed project will provide are expected to reduce system losses in the range of 10% to 30% as documented in the case study in Appendix C, page 83. The better measurement and system control afforded by the project will allow the District to significantly reduce system losses due to over-deliveries and excess spills and will result in water savings of approximately 4,366 AF annually.

The estimated annual water savings of 4,366 AF is calculated as:

On average, 145,525 AF is conveyed into the 9 laterals in the project area.

Based on the most recent Agricultural Water Management Report, approximately 30% of District diversions end up as system losses.

$145,525 \text{ AF annually} \times 30\% = 43,658 \text{ system losses within project area annually.}$

Similar projects in other open-channel irrigation systems result in a 10% reduction in system losses on the low end of the expected loss reduction range.

$43,658 \text{ AF annually} \times 10\% = 4,366 \text{ AF in water saved annually.}$

The District feels this 4,366 AF in estimated annual water savings is reasonable for two primary reasons:

- Delivering water in an open-channel irrigation system is inherently fairly imprecise, at least without the aid of modern flow control and measurement devices. It's fairly easy for a water operator to know if they are under-delivering water to a field—it either won't be filling fast enough or the level will be dropping. Further, a grower that feels that the water being delivered to their field is not of sufficient volume is likely to let their water operator know. However, the same dynamic is not present with over-deliveries—in that case the excess water will be spilling but the field level will remain the same, so the over-delivery is harder to observe than the under-delivery. Additionally, growers tend not to notice or raise the issue of an excess volume of water being delivered to a flood irrigated field. For these reasons it is significantly more likely to over-deliver rather than under-deliver agricultural water. The most effective way to improve this is with better measurement and control tools, which the proposed projects will provide.
- Entirely apart from this grant application, the District is working to implement the H2oTech Remote Tracker water measurement system (an integrated field-level flow measurement and water accounting system) across the entire service area (the system has been used along the Main Canal for several years). The Remote Tracker system is designed to measure and record field-level water deliveries and use of the Remote Tracker system will allow for much more precise measurement and control of all field-level deliveries. Implementation of the Remote Tracker system is mentioned in this grant application because use of Remote Tracker is entirely complimentary to the projects proposed in this application and will very much work in concert with the proposed improvements to achieve the stated water savings.

Please address the following questions according to the type of infrastructure improvement you are proposing for funding.

(1) Canal Lining/Piping: *Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address:*

- *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

❖ N/A

- *How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*

❖ N/A

- *What are the expected post-project seepage/leakage losses, and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?*

❖ N/A

- *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of the canal included in the project?*

❖ N/A

- *How will actual canal loss seepage reductions be verified?*

❖ N/A

- *Include a detailed description of the materials being used.*

❖ N/A

(2) Municipal Metering: Municipal metering projects can provide water savings when individual user meters are installed where none exist to allow for unit or tiered pricing and when existing individual user meters are replaced with advanced metering infrastructure (AMI) meters. To receive credit for water savings for a municipal metering project, an applicant must provide a detailed description of the method used to estimate Page 10 of 22 savings, including references to documented savings from similar previously implemented projects. Applicants proposing municipal metering projects should address the following:

- *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

❖ N/A

- *How have current system losses and/or the potential for reductions in water use by individual users been determined?*

❖ N/A

- *For installing end-user water service meters, e.g., for a residential or commercial building unit., refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.*

❖ N/A

- *What types (manufacturer and model) of devices will be installed and what quantity of each?*

❖ *N/A*

- *How will actual water savings be verified upon completion of the project?*

❖ *N/A*

(3) Irrigation Flow Measurement: *Irrigation flow measurement improvements can provide water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators. Applicants proposing irrigation flow measurement projects should address:*

- *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*

❖ The District has reliable data regarding the volume of water that enters each of the laterals in the conveyance system. On a daily basis, the District's water operators take a flow measurement at each of the lateral headgates where the lateral branches from the Main Canal. These daily readings provide water operations staff with information about system conditions and are stored in a central database. The daily readings are obtained by various measurement devices, including Global Water Velocity Probes, ITRC's Weir Sticks, and H2OTech RemoteTracker Acoustic Doppler Velocimeters. Additionally, the total volumes entering each lateral are fairly consistent across similar year types.

As stated above, an average of 145,525 AF is conveyed annually into the 9 laterals where the specific projects included in this grant application are located. These 9 laterals serve 26,591 acres of farmland, most of which is cultivated as rice and irrigated with flood irrigation. The flow control and measurement improvements that the proposed project will provide are expected to reduce system losses in the range of 10% to 30% as documented in the case study in Appendix C (page 83). The better measurement and system control afforded by the project will allow the District to significantly reduce system losses due to over-deliveries and excess spills and will result in water savings of approximately 4,366 AF annually.

The estimated annual water savings of 4,366 AF is calculated as:

On average, 145,525 AF is conveyed into the 9 laterals in the project area.

Based on the most recent Agricultural Water Management Report, approximately 30% of District diversions end up as system losses.

$145,525 \text{ AF annually} \times 30\% = 43,658 \text{ system losses within project area annually.}$

Similar projects in other open-channel irrigation systems result in a 10% reduction in system losses on the low end of the expected loss reduction range.

43,658 AF annually x 10% = 4,366 AF in water saved annually.

The District feels this 4,366 AF in estimated annual water savings is reasonable for two primary reasons:

- Delivering water in an open-channel irrigation system is inherently fairly imprecise, at least without the aid of modern flow control and measurement devices. It's fairly easy for a water operator to know if they are under-delivering water to a field—it either won't be filling fast enough or the level will be dropping. Further, a grower that feels that the water being delivered to their field is not of sufficient volume is likely to let their water operator know. However, the same dynamic is not present with over-deliveries—in that case the excess water will be spilling but the field level will remain the same, so the over-delivery is harder to observe than the under-delivery. Additionally, growers tend not to notice or raise the issue of an excess volume of water being delivered to a flood irrigated field. For these reasons it is significantly more likely to over-deliver rather than under-deliver agricultural water. The most effective way to improve this is with better measurement and control tools, which the proposed projects will provide.
 - Entirely apart from this grant application, the District is working to implement the H2oTech Remote Tracker water measurement system (an integrated field-level flow measurement and water accounting system) across the entire service area (the system has been used along the Main Canal for several years). The Remote Tracker system is designed to measure and record field-level water deliveries and use of the Remote Tracker system will allow for much more precise measurement and control of all field-level deliveries. Implementation of the Remote Tracker system is mentioned in this grant application because use of Remote Tracker is entirely complimentary to the projects proposed in this application and will very much work in concert with the proposed improvements to achieve the stated water savings.
- *Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.*
 - ❖ As described above, District data shows that on average, 145,525 AF of water is conveyed into the 9 laterals where the projects proposed as part of this grant application are located. The District's most recently completed Agricultural Water Management Plan shows that in a typical year, approximately 30% of District diversions end up as system losses, which for these nine laterals equates to approximately 43,658 AF per irrigation season. The District's vast system of

laterals is entirely manually operated and has almost no automated measurement. Completion of the proposed projects will, within the 9 laterals where the projects are located, greatly increase water flow and level control and measurement capacity. The case study in Appendix C (page 83) details similar improvements in another open channel irrigation system and finds that such improvements generally result in a 10% to 30% reduction in operational losses. Therefore, utilizing the low end of the loss reduction range results in an average annual savings of 4,366 AF (the average volume of water that enters the laterals in the project area annually of 145,525 AF multiplied by 30% estimate for operational losses, with the product multiplied by the low-end estimate of 10% reduction in losses from the improvements completed pursuant to the project).

- *Are flows currently measured at proposed sites, and if so, what is the accuracy of existing devices? How has the existing measurement accuracy been established?*
 - ❖ The District has reliable data regarding the volume of water that enters each of the laterals in the conveyance system. On a daily basis, the District's water operators take a flow measurement at each of the lateral headgates where the lateral branches from the Main Canal. These daily readings provide water operations staff with information about system conditions and are stored in a central database. The daily readings are obtained by various measurement devices, including Global Water Velocity Probes, ITRC's Weir Sticks, and David's Engineering RemoteTracker Acoustic Doppler Velocimeters. Additionally, the total volumes entering each lateral are fairly consistent across similar year types.
- *Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.*
 - ❖ Rubicon FlumeGates, SlipMeters, and PikoMeters are the proposed devices for the proposed project. The proposed gates automatically adjust to maintain a consistent flow rate or water level in response to changes in upstream and downstream flows, reducing the amount of water spilled from the system. Additionally, Rubicon gates can be utilized to monitor and meter the flow of water with an accuracy of $\pm 2.5\%$. The specifications made by Mace regarding the Doppler Ultrasonic Insert Velocity Sensor include an accuracy of $\pm 1\%$ for velocities up to 10 feet per second. The Insert sensors use continuous Doppler ultrasound waves to measure the speed of particles in the water during operation. As for the SonTek-SL 1500 (3G), the accuracy is shared as $\pm 1\%$ or ± 0.015 feet per second. The SonTek SL is a simple, but accurate, way to measure the velocity and level of the water in an open channel. See Appendix B, starting on page 63, for data sheets on all proposed gates.
- *Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?*

- Yes, implementing this project will reduce over- delivery at the field level. With the improved measurement and flow and level control capability achieved through completion of the project, lateral levels will remain more stable, resulting in more precise field level deliveries. Further, water operators will spend much less time driving to spill locations to observe conditions and making related changes in water control structures, and will therefore have more time to spend observing and making adjustments to field level deliveries. Additionally, and entirely apart from this grant application, the District is working to implement the H2oTech Remote Tracker water measurement system (an integrated field-level flow measurement and water accounting system) across the entire service area (the system has been used along the Main Canal for several years). The Remote Tracker system will allow for much more precise measurement and control of all field-level deliveries. Implementation of the Remote Tracker system is mentioned in this grant application because use of Remote Tracker is entirely complimentary to the projects proposed in this application and will very much work in concert with the proposed improvements to achieve the stated water savings.
 - *How will actual water savings be verified upon completion of the project?*
 - ❖ After the automated headgate measurement devices and FlumeGates are installed and integrated into the SCADA system, flow rates into the laterals, and amounts of water spilled at the end of each lateral, will be compared to existing data. Monthly post-project water volumes will also be compared to pre-project water volumes during the months without precipitation events to deduce if a mass balance comparison can be used to evaluate the performance of the Rubicon headgates, generally between April and October annually. The interaction of water delivered to specific fields over time will increasingly grow more accurate due improvements in water measurements which will allow for another data set for post-project data to be compared to.
- (4) Turf Removal:** *Applicants proposing turf removal projects should address:*
- *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*
 - ❖ N/A
 - *What is the total surface area of turf to be removed, and what is the estimated average annual turf consumptive use rate per unit area?*
 - ❖ N/A

- *Was historical water consumption data evaluated to estimate average annual turf consumptive use per unit area? If so, did the evaluation include a weather adjustment component?*

❖ *N/A*

- *Will site audits be performed before applicants are accepted into the program?*

❖ *N/A*

- *How will actual water savings be verified upon completion of the project?*

❖ *N/A*

(5) Smart Irrigation Controllers, Controllers with Rain Sensor Shutoff, Drip Irrigation, and High-Efficiency Nozzles: Applicants proposing smart irrigation controllers, controllers with rain sensor shutoff, drip irrigation, or high-efficiency nozzle projects should address:

- *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*

❖ *N/A*

- *Was historical water consumption data evaluated to estimate the percent reduction in water demand per unit area of the irrigated landscape? If so, did the evaluation include a weather adjustment component?*

❖ *N/A*

- *What types (manufacturer and model) of devices will be installed, and what quantity of each?*

❖ *N/A*

- *Will the devices be installed through a rebate or direct-install program?*

❖ *N/A*

- *Will site audits be performed before and after installation?*

❖ *N/A*

- *How will actual water savings be verified upon completion of the project?*

❖ *N/A*

(6) High-Efficiency Indoor Appliances and Fixtures: Installing high-efficiency indoor appliances and fixtures can provide water savings for municipal water entities where there is significant potential for replacing existing non-efficient indoor appliances and fixtures. Applicants proposing high-efficiency indoor appliance and fixtures projects should address:

- *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*

❖ *N/A*

- *What types (clothes washers, shower heads, etc.) of appliances and fixtures will be installed, and what quantity of each?*

❖ *N/A*

- *Have studies been conducted to verify the existence of non-efficient appliances and fixtures? Provide published water savings rates for each of these devices and reference the source for each of the device savings rates.*

❖ N/A

- Will the devices be installed through rebate or direct-install programs?

❖ N/A

- How will actual water savings be verified upon completion of the project?

❖ N/A

(7) Commercial Cooling Systems: Cooling towers are components of many refrigeration systems with many applications. They dissipate heat to the atmosphere through the evaporative process and are common in manufacturing processes where cooling is required. They are also used for cooling large commercial buildings. Cooling tower structures vary in size, design, and efficiency. Regardless, all cooling towers consume large volumes of water and energy. Open-circuit or direct contact are the most common types of cooling towers. Water is supplied to the tower after gathering heat and then released in the upper tower levels. A fan near the base of the tower creates upward airflow. Closed-circuit towers are more efficient and closed-circuit towers with adiabatic cooling are more efficient yet. Water and energy savings can be achieved by replacing or retrofitting older, low-efficiency cooling towers. Applicants proposing cooling system projects should address:

- How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.

❖ N/A

- Was historical water consumption data evaluated to estimate the percent reduction in water demand?

❖ N/A

- Specify the type (manufacturer and model) of the cooling tower system to be installed and/or provide a detailed description of the system retrofit plan.

❖ N/A

Evaluation Criteria B – Renewable Energy

Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water

Management and Delivery

Describe the amount of energy capacity. For projects that implement renewable energy systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate

❖ N/A

Describe the amount of energy generated. For projects that implement renewable energy systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate. Please explain how the power generated as a result of this project will be used, including any existing or planned agreements and infrastructure.

❖ N/A

Describe the status of a mothballed hydropower plant. For projects that are bringing mothballed hydropower capacity back online, please describe the following:

- *Clearly describe the work that will be accomplished through the WaterSMART Grant.
Note: normal OM&R activities are not eligible for funding. The work being proposed must be an investment.*
❖ N/A
- *Provide information about the capacity (in kilowatts) of the existing hydro system and the expected capacity once it is brought back on-line.*
❖ N/A
- *Provide information about the duration that the hydro system has been offline and the reasons why it has been mothballed. Please include any regulatory reporting or filings (e.g., FERC filings) or other documentation regarding the system*
❖ N/A

Describe any other benefits of the renewable energy project. Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:

- *How the system will combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions*
❖ N/A
- *Expected environmental benefits of the renewable energy system*
❖ N/A
- *Any expected reduction in the use of energy currently supplied through a Reclamation project.*
❖ N/A
- *Anticipated benefits to other sectors/entities*
❖ N/A
- *Expected water needs, if any, of the system.*
❖ N/A

AND/OR

Subcriterion No. B.2: Increasing Energy Efficiency in Water Management

Describe any energy efficiencies that are expected to result from the implementation of the water conservation or water efficiency project (e.g., reduced pumping).

- *If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt-hours per year.*
❖ N/A

- *How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.*
 - ❖ Creating continuous measurement and automation within the portion of the District's laterals included in this project will address the impacts of climate change through the responsible usage of available water. Using automated gates increases water conservation at a rate of 10-30% of total annual losses at the nine project laterals. It mitigates the amount of water lost via excess seepage and spillage while maintaining a consistent flow rate for customers. Lateral spills that are followed by recapture pumps will also be monitorable due to measurement and flexibility of operations using automated gates and SCADA control sites. Additionally, the canal automation negates the need for individuals to travel to the site and manage the canal. Eliminating routine vehicle travel reduces the overall carbon emissions associated with manual gate operations.
- *If the project will result in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements and energy usage?*
 - ❖ The main reduction in pumping will occur at the Districts' diversion off of the Sacramento River. A reduction in pumping reduces maintenance, operational cost, and water savings at the Main Pump Station. The maximum capacity of the pump station and main canal system is 3000 cfs. Below is a list of the pumps located at the Main Pump Station found just north of Hamilton City, CA on the Sacramento river.
 - Pump 1: 150 cfs (3 phase, 2300 volts, 250 Horsepower)
 - Pump 2: 150 cfs (3 phase, 2300 volts, 250 Horsepower)
 - Pump 3: 400 cfs (3 phase, 2300 volts, 600 Horsepower)
 - Pump 4: 400 cfs (3 phase, 2300 volts, 600 Horsepower)
 - Pump 5: 400 cfs (3 phase, 2300 volts, 600 Horsepower)
 - Pump 6: 400 cfs (3 phase, 2300 volts, 600 Horsepower)
 - Pump 7: 400 cfs (3 phase, 2300 volts, 600 Horsepower)
 - Pump 8: 400 cfs (3 phase, 2300 volts, 600 Horsepower)
 - Pump 9: 200 cfs (3 phase, 2300 volts, 300 Horsepower)
 - Pump 10: 100 cfs (3 phase, 2300 volts, 150 Horsepower)

During a typical irrigation season (April through October), the Main Pump Station uses approximately 8,000,000 Kwh of electricity and pumps an average of 673,942 AF of water (or 11.88 Kwh per AF). Completion of the project will result in a water savings of 4,366 AF per year, which will in turn result in decreased diversions of approximately the same amount. At a rate of 11.88 Kwh per AF, reducing diversions by 4,366 AF per year will save an average of approximately 51,868 Kwh per year.

The recapture pump station found downstream of lateral 41-1 recycles on average 25 cfs and the following pumps are used.

- Pump 1: 15 cfs 3 Phase, ##Volts, (25 Horsepower)
 - Pump 2: 11 cfs (3 Phase, ## Volts, 20 Horsepower)
 - There will not be data from the 41-1 spill sites showing a reduction of spillage but the District will have better data to use for operational purposes.
- *Please indicate whether your energy savings estimate originates from the point of diversion or whether the estimate is based upon an alternate site of origin.*
 - ❖ N/A
 - *Does the calculation include any energy required to treat the water, if applicable?*
 - ❖ N/A
 - *Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.*

Yes, the canal automation reduces the need for individuals to travel to specific sites to manage the various laterals. Eliminating routine vehicle travel reduces the overall carbon emissions associated with manual gate operations as much as 41,541 miles per water season and 61 days of driving in a F-150 pickup per water season. Below are the supporting calculations.

Miles saved per water season

$$\begin{aligned}
 &= \text{Total Mileage of Improved Spill Laterals} * \text{Twice a day} \\
 &* \text{Days from April 1st to October 1st} \\
 &= 114 \text{ mi} * 2 * 183 \text{ days} \\
 &= 41,541 \text{ miles saved}
 \end{aligned}$$

Time saved per water saved

$$\begin{aligned}
 &= \text{Avg driving time to spill} * \text{twice a day} * \# \text{ of spill sites improved} \\
 &* \# \text{ of days from April 1st to Oct. 1st.} \\
 &= 0.5 \text{ hrs} * 2 \text{ visits per day} * 8 \text{ sites} * 183 \text{ days}
 \end{aligned}$$

- ***= 1,464 hours saved = 61 days saved per season***
- *Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).*
 - ❖ All proposed project sites are powered by a solar panel placed atop the control pedestal or near the control box, which sits along the canal bank. This eliminates the need to tie the gate controls to a power source and thus reduces overall energy consumption and cost.

Evaluation Criteria C – Other Project Benefits

Sustainability Benefits. Will the project address a specific water and/or energy sustainability concern? Please address the following:

- ❖ *Explain and provide details of the specific issue(s) in the area that is impacting water sustainability. Consider the following:*
 - *Describe recent, existing, or potential drought or water scarcity conditions in the project area.*

- ❖ The project occurs in an area continually impacted by varying drought conditions throughout the last 15+ years. Unpredictable precipitation and reservoir levels year by year result in a need to be proactive for future drought conditions. As seen here:
<https://www.drought.gov/states/california/county/Glenn> and
<https://www.drought.gov/states/california/county/Colusa> from 2007 through 2023, Glenn and Colusa County has experienced extended dry periods that range from D4 (exceptional drought) to D0 (abnormally dry).
- Is the project in an area that is experiencing or has recently experienced drought or water scarcity?
 - ❖ This project area has experienced a range of drought conditions throughout the last 15+ years, and more specifically, D4 (exceptional drought) and D3 (extreme drought) over the past four years. See *Figure 15* below for supporting data for Glenn County, similar data can be found for Colusa county here <https://www.drought.gov/states/california/county/Colusa>.

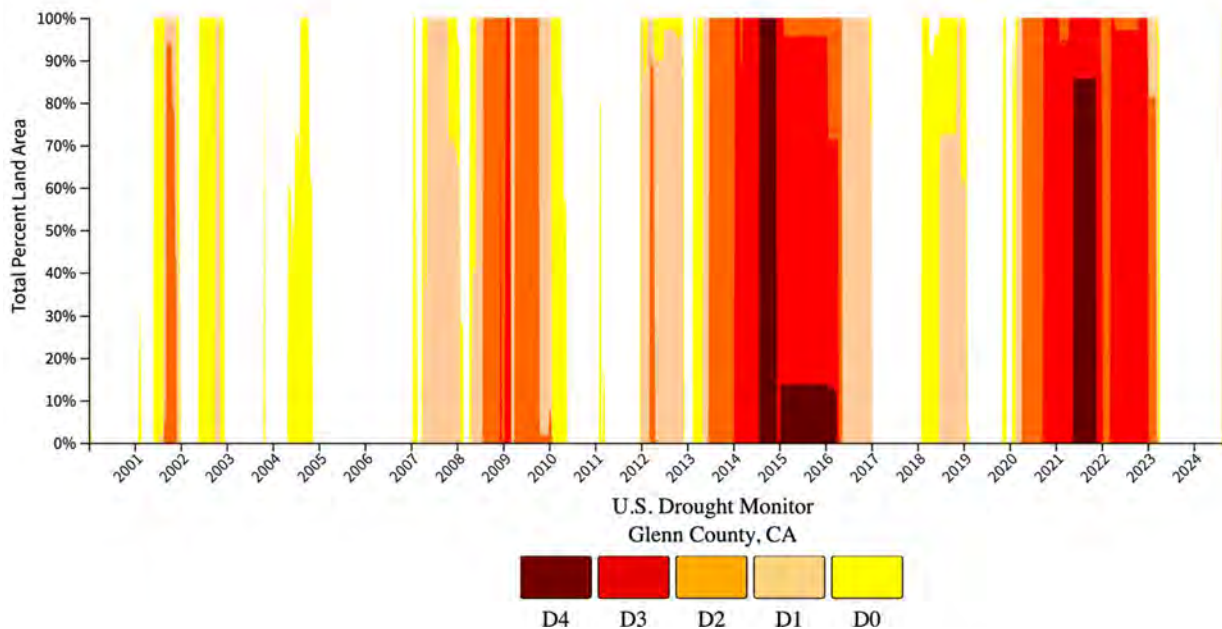


Figure 15 Historic Drought Conditions for Glenn County, CA, <https://www.drought.gov/states/california/county/Glenn>

- Describe any projected increases to the severity or duration of drought or water scarcity in the project area. Provide support for your response (e.g., reference a recent climate-informed analysis, if available).
- ❖ According to the Climate Mapping For Resilience and Adaptation portal (<https://livingatlas.arcgis.com/assessment-tool/explore/map>), the average annual total precipitation in the project area is around 24.9 inches. This area receives slightly more precipitation than a semi-arid landscape does. Climate

modeling predicts that this area will continue to experience similar rainfall in the coming years, with varying prolonged dry and hot periods.

- *Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.*
 - ❖ At present, varying dry and hot conditions and sporadic demand on the canal system cause over- and under-delivery of water to be sent through the system to maintain adequate flow to irrigators. When water that has been sent into the system is lost due to seepage and spillage from over-delivery, it creates unnecessary energy expenditures, which promotes needless energy consumption.
- *Please describe how the project will directly address the concern(s) stated above.*
 - ❖ This project is expected to reduce the overall amount of water lost through over-delivery and spillage, reducing the total water required to be diverted to meet GCID's demands. Additionally, this project will allow GCID to more adequately control and measure the flow of water, which will, in turn, increase the ability of the district to maintain customer service levels sustainably.
- *Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?*
 - ❖ Yes, the overall goal of the project is to provide improved flow and level control and measurement within a portion of the District's conveyance system and completion of the project will allow the District to more accurately control flow and eliminate unnecessary over-deliveries and excess spills. Additionally, the metering devices and SCADA integration will allow for a quicker response to system changes, allowing for more efficient water management and accurate flow data collection.

As stated previously, and entirely apart from this grant application, the District is working to implement the H2oTech Remote Tracker water measurement system (an integrated field-level flow measurement and water accounting system) across the entire service area (the system has been used along the Main Canal for several years). The Remote Tracker system will allow for much more precise measurement and control of all field-level deliveries.

Implementation of the Remote Tracker system is mentioned in this grant application because use of Remote Tracker is entirely complimentary to the projects proposed in this application and will very much work in concert with the proposed improvements to achieve the stated water savings.

❖ *Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

❖ **Water conserved as a result of this project will allow the District to reduce diversions from the river at the Main Pump Station.**

❖ *Indicate the quantity of conserved water that will be used for the intended purpose(s).*

❖ **The District estimates that completion of the proposed projects included in this application will result in an average of approximately 4,366 AF of water being conserved on an annual basis.**

The District's irrigation season is from April 1 through October 31 of each year. Data from 2018 to 2021 and 2023 (2022 is excluded as the severe drought conditions present at the time resulted in an anomalously low water supply) show that the District diverts an average of 673,942 AF per irrigation season at its Main Pumping Station. Of this average total diversion, an average of 145,525 AF is conveyed annually into the 9 laterals where the specific projects included in this grant application are located. These 9 laterals serve 26,591 acres of farmland, most of which is cultivated as rice and irrigated with flood irrigation. The District's most recently completed Agricultural Water Management Plan shows that in a typical year, approximately 30% of District diversions end up as system losses, which for these nine laterals equates to approximately 43,658 AF per irrigation season.

Based on similar projects in other open-channel irrigation systems, the types of water control and measurement improvements proposed in this grant application typically result in reductions in system losses of between 10% and 30%. Appendix C includes a case study discussing such water use efficiency improvements, starting on page 83. Hence, a conservative estimate of annual water savings is $43,658 \text{ AF} \times 10\% = 4,366 \text{ AF}$.

Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.

❖ **The project will result in reduced over-deliveries and excess spills, which in turn will allow the District to reduce diversions from the Sacramento River at its Main Pump Station.**

• *Will the project assist States and water users in complying with interstate compacts?*

❖ **This project will not assist States and water users in complying with interstate compacts.**

- *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*

❖ **Reductions in diversions by the District will allow more water to remain in the Sacramento River for other uses.**

Ecological Benefits. *In addition to the separate WaterSMART Environmental Water Resources Projects NOFO, this NOFO places a priority on projects that result in ecological benefits through this section and other sections above, consistent with the SECURE Water Act. Please provide information regarding how the project will provide ecosystem benefits, including the following:*

- *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state-listed species, or a species of particular recreational or economic importance)? Please describe the relationship of the species to the water supply and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).*

❖ **No, there are no known species that this project will directly benefit.**

- *Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits (e.g., maintaining water temperatures or water levels, recreational benefits, etc.).*

❖ **Water conserved by the project will result in reduced pumping at the District's Main Pump Station, allowing more water to remain in the Sacramento River than would otherwise occur.**

- *Will the proposed project reduce the likelihood of a species listing or otherwise improve the species' status?*

❖ **No, this project does not directly reduce the likelihood of a species listing or improving a list status.**

- *Please describe any other ecosystem benefits as a direct result of the project.*

❖ **N/A**

Climate Change: *E.O. 14008 emphasizes the need to prioritize and take robust actions to reduce climate pollution, increase resilience to the impacts of climate change, protect public health, and conserve our lands, waters, oceans, and biodiversity.*

- *Describe how the project addresses climate change and increases resiliency. For example, does the project help communities respond to or recover from drought?*

❖ **The proposed project will increase the efficiency and sustainability of water delivery to agricultural providers by minimizing over-delivery and spillage through automation. Increased water flow and level control will aid in application**

efficiency, which improves sustainability and resiliency during droughts brought on by climate change.

- *Does the project seek to improve ecological resiliency to climate change?*
 - ❖ Yes. By managing water flow more consistently and sustainably, more water is left in the river. The reduction in excess spillage and seepage allows more water to be utilized by all other aspects of the environment.
- *Does the proposed project seek to reduce or mitigate climate pollution, such as air or water pollution?*
 - ❖ Yes. Currently, all listed site adjustments in the project area are accomplished manually. Implementing automation via this project will eliminate the need for water operators to drive to individual gates to make changes and evaluate flow. Reducing the number of miles driven will lower the emissions GCID vehicles generate. Please refer to Criteria B.2 for more specifics.
- *Does the proposed project include green or sustainable infrastructure to improve community climate resilience?*
 - ❖ The addition of automation within the District's system of laterals will address the impacts of climate change through the responsible usage of available water. Using automated gates increases water conservation at a rate of 10-30% of total annual flow while minimizing water lost through spillage and leaks at headgates. The proposed automated head headgates adapt to the changing lateral water levels in real time before water operations staff would need to drive to each site and make adjustments to the spill releases or canal flows. Additionally, the automation of the laterals negates the need for individuals to travel to the site and manage the lateral. Eliminating routine vehicle travel reduces the overall carbon emissions associated with manual gate operations. The control panel for the proposed automated gates is also operated via solar power and a solar panel, further contributing to GCID's ability to manage its water through sustainable means.
- *Does the proposed project contribute to climate change resiliency in other ways not described above?*
 - ❖ Through sustainable water management in a variable climate landscape, this project would also ensure more consistent water availability for end users, environmental factors, and wildlife throughout the project area.

Evaluation Criteria D – Disadvantaged Communities and Tribal Benefits

Subcriterion D.1. Disadvantaged or Underserved Communities: E.O. 14008 and E.O. 13985 affirm the advancement of environmental justice and equity for all through the development and funding of programs to invest in disadvantaged or underserved communities. For the purposes of this criterion, Tribes and insular areas (American Samoa, Guam, the Northern Mariana Islands, or the Virgin Islands) are considered disadvantaged.

- Please use the White House Council on Environmental Quality’s interactive Climate and Economic Justice Screening Tool, available online at Explore the map - Climate & Economic Justice Screening Tool (<https://screeningtool.geoplatform.gov/en/#17.59/36.63278/-105.181329>) to identify any disadvantaged communities that will benefit from your project. The Climate and Page 16 of 22 Economic Justice Screening Tool (CEJST) developed by the White House Council on Environmental Quality is a geospatial mapping tool that utilizes publicly available, nationally consistent data sets related to climate change, the environment, health, and economic opportunity to identify disadvantaged communities. In addition to identifying specific census tracts that are disadvantaged, the CEJST considers the lands of Federally Recognized Tribes as disadvantaged communities. In addition, regardless of whether a Federally Recognized Tribe has land, all Federally Recognized Tribal entities are considered disadvantaged communities for the purposes of the Justice40 Initiative. [1]
 - ❖ The project takes place in Glenn and Colusa Counties, CA. The project is in parts of the District that is considered to be disadvantaged and partially disadvantaged via the online screening tool.
- If applicable, describe how the proposed project will serve or benefit a disadvantaged or underserved community, identified using the tool. For example, will the project improve public health and safety by addressing water quality, add new water supplies, provide economic growth opportunities, or provide other benefits in a disadvantages or underserved community?
 - ❖ The project will positively impact producers and employees in the agriculture industry within the district’s service area that stand to be disproportionately impacted by the effects of climate change and significant weather events. By aiding in water delivery efficiency and reducing over- and under-deliveries, this project will positively impact landowners in the agricultural sector within the service area whose livelihood depends on their ability to produce healthy agricultural crops and aid the economy in surrounding communities, such as the cities of Willows, Maxwell, and Williams.

Subcriterion D.2. Tribal Benefits: The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President’s

memorandum, Tribal Consultation and Strengthening Nation-to Nation Relationships, asserts the importance of honoring the Federal government’s commitments to Tribal Nations. Please address the following, if applicable:

- *Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?*

❖ **No, this project does not directly benefit or serve a tribe.**

- *Does the proposed project support Tribally led conservation and restoration priorities, and/or incorporate or benefit Indigenous Traditional Knowledge and practices?*

❖ **No, this project does not support the above-mentioned programs.**

❖ *Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety through water quality improvements, new water supplies, increased renewable energy, or economic growth opportunities? Does the proposed project support Reclamation’s Tribal trust responsibilities or a Reclamation activity with a Tribe?***No. [1]** OMB, CEQ, & CPO, M-23-09, Addendum to the Interim Implementation Guidance for the Justice40 Initiative, M-21-28, on using the Climate and Economic Justice Screening Tool (CEJST) (Jan. 27, 2023), https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf.

Evaluation Criteria E – Completing On-Farm Irrigation Improvements

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.

- *Provide a detailed description of the on-farm efficiency improvements.*
 - ❖ **N/A**
- *Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?*
 - ❖ **N/A**
- *If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs*
 - ❖ **N/A**

- *Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*
❖ N/A
- *Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.*
❖ N/A
- *Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how? For example, installing a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip irrigation.*
❖ N/A

OR

- *Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?*
❖ N/A
- *Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.*
❖ N/A
- *Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*
❖ N/A
- *Please provide a map of your water service area boundaries. If your project is selected for funding under this NOFO, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.*
❖ N/A

Note: On-farm water conservation improvements that complement the water delivery improvement projects selected through this NOFO may be considered for NRCS funding and technical assistance to the extent that such assistance is available. For more information, including application deadlines and a description of available funding, please contact your local NRCS office. See the NRCS website for office contact information, <https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/state-offices>

Evaluation Criteria F – Readiness to Proceed

Applications that include a detailed project implementation plan (e.g., an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- *Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description*

provided in Section D.2.2.2. Application Content. This section should focus on a summary of the major tasks to be accomplished as part of the project.

- ❖ Once funding for this project is awarded and a Notice to Proceed is issued by Reclamation, GCID crews will begin ordering project materials. Construction and any ground-disturbing activities will be performed within a small radius of the existing headgates and canals. Ground-disturbing activities will be minimal; no permits are expected to be required. A detailed schedule is shown below in *Figure 16*, as well as a bulletized summary of events.

Lateral 16-4f Modernization

October 2025

- Obtain and organize all Rubicon Gates and supplies for installation.

November 2025

- Installation of gates starts.

December 2025

- Continue installation of gates.
- Work with Sierra Controls to integrate sites into SCADA.

January 2026

- Complete installation of gates.
- Complete SCADA integration.

Main Canal Headgate Measurement Improvement

October 2025 - November 2025

- Address any permitting, monitoring, or mitigation needs prior to any work beginning.
- Obtain and organize all supplies for installation.

December 2025

- Retrofit structures as needed for measurement requirements.

January 2026

- Install (2) Mace meters and (1) SideLooker to correlated sites.
- Install antenna, radio, solar panels, etc to connect sites to SCADA

February 2026

- Complete installation of measurement devices.
- Install antenna, radio, solar panels, etc to connect sites to SCADA.
- Work with Sierra Controls to integrate sites into SCADA.

March 2026

- Complete Integration of sites into SCADA.

***Break until November 2026*

November 2026

- Address any permitting, monitoring, or mitigation needs prior to any work beginning.
- Obtain and organize all supplies for installation.

December 2026

- Retrofit structures as needed for measurement requirements.

January 2027

- Install (3) Mace meters to correlated sites.
- Install antenna, radio, solar panels, etc to connect sites to SCADA

February 2027

- Complete installation of measurement devices.
- Install antenna, radio, solar panels, etc to connect sites to SCADA.
- Work with Sierra Controls to integrate sites into SCADA.

March 2027

- Complete Integration of sites into SCADA.

***Break until November 2027*

November 2027

- Address any permitting, monitoring, or mitigation needs prior to any work beginning.
- Obtain and organize all supplies for installation.

December 2027

- Retrofit structures as needed for measurement requirements.

January 2028

- Install (2) Mace meters to correlated sites.
- Install antenna, radio, solar panels, etc to connect sites to SCADA

February 2028

- Complete installation of measurement devices.
- Install antenna, radio, solar panels, etc to connect sites to SCADA.

- Work with Sierra Controls to integrate sites into SCADA.

March 2028

- Complete Integration of sites into SCADA.

Spill Modernization

February 2026 – March 2026

- Address any permitting, monitoring, or mitigation needs prior to any work beginning.
- Complete inspections and surveys of sites.
- Prepare designs and materials for (3) spills.

April 2026 – June 2026

- Pre-construction meetings with all departments.
- Retrofit/Replace (3) spill sites.
- Obtain Rubicon gates and supplies.

July 2026

- Retrofit/Replace (3) spill sites.
- Installation of Rubicon Gates starts.

August 2026

- Complete construction at (3) spill sites.
- Installation of Rubicon Gates continues.

September 2026

- Complete installation of Rubicon gates at (3) spill sites.
- Start integrating sites into SCADA with Sierra Controls.

October 2026

- Complete integration of spill sites into SCADA system.

***Break until February 2027*

February 2027 – March 2027

- Address any permitting, monitoring, or mitigation needs prior to any work beginning.
- Complete inspections and surveys of sites.
- Prepare designs and materials for (3) spills.

April 2027 – June 2027

- Pre-construction meetings with all departments.
- Retrofit/Replace (3) spill sites.
- Obtain Rubicon gates and supplies.

July 2027

- Retrofit/Replace (3) spill sites.
- Installation of Rubicon Gates starts.

August 2027

- Complete construction at (3) spill sites.
- Installation of Rubicon Gates continues.

September 2027

- Complete installation of Rubicon gates at (3) spill sites.
- Start integrating sites into SCADA with Sierra Controls.

October 2027

- Complete integration of spill sites into SCADA system.

***Break until February 2028*

February 2028 – March 2028

- Address any permitting, monitoring, or mitigation needs prior to any work beginning.
- Complete inspections and surveys of sites.
- Prepare designs and materials for (2) spills.

April 2028 – June 2028

- Pre-construction meetings with all departments.
- Retrofit/Replace (2) spill sites.
- Obtain Rubicon gates and supplies.

July 2028

- Retrofit/Replace (2) spill sites.
- Installation of Rubicon Gates starts.

August 2028

- Complete construction at (2) spill sites.
- Installation of Rubicon Gates continues.

September 2028

- Complete installation of Rubicon gates at (2) spill sites.

- Start integrating sites into SCADA with Sierra Controls.

October 2028

- Complete integration of spill sites into SCADA system.

Confirm Completion of all projects by October 2028

- *Describe any permits that will be required, along with the process for obtaining such permits.*
 - ❖ No permits are expected to be required to complete this project. If it is determined a permit is necessary, it will be obtained prior to any ground-disturbing activities.
- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*
 - ❖ Each installation is unique, requiring some modification to the laterals included in the project area. GCID will support the construction and installation of the proposed gates and metering devices. District engineers have been working with Rubicon in selecting the best Rubicon structure for each individual site. This included continuous communication, flow and dimension observations, site visits and more. District engineers, with help from water operations staff, identified the sites included in this project. District engineers created project estimates and assisted in writing the grant application. Engineering work to be completed for this project is as follows: surveying 8 spill sites, designing structures for each spill site, site visits at all sites during construction and gate installations. All engineering work will be done by District engineers.
- *Describe any new policies or administrative actions required to implement the project.*
 - ❖ No new policies or administrative actions will be required to implement and complete this project.
- *Describe the current design status of the project. If additional design work is required prior to construction, describe the planned process and timeline for completing the design work.*
 - ❖ Rubicon engineers have reviewed the original drawings on the District's lateral infrastructure and followed up with a site visit to verify their accuracy. A scoping study has been generated for lateral 16-4f. An initial scope and estimate for all spill sites has been conducted by Rubicon with the help of the District staff. Designs for spill structures have not been completed but have been discussed with the Rubicon engineers. Each spill site will need to be re-inspected, surveyed, and designed by District engineers. Initial inspections have occurred, but in-depth inspections and surveys will happen within the District's shutdown period (January 7th to March 1st of each year) when the conveyance system is dewatered. Inspections include engineers taking photos and measurements. Each site will be surveyed with a survey grade GPS by District staff. The engineers will then design each spill replacement site on AutoCAD using the District's standard spill design. Design capacity will be discussed with the water department and operators. Site maps, flow

capacity, dimensioning of the structure, rebar plans, and materials needed to complete the project will be included in the design drawings. These designs will be stamped and signed by the District's engineer (CA-licensed professional engineer). The designs will then be shared with maintenance supervisors and Rubicon staff to start the construction planning efforts and the selection of Rubicon gates. Pre-construction meetings with construction crews, maintenance supervisors, and engineering staff will occur before any construction begins. GCID engineers will continue to conduct site visits and offer assistance during all projects until completed. All work will be explained to maintenance crews and water operators as needed to ensure proper operation and maintenance to the improved structures. All engineering work will be completed by District engineers, including data analysis. Please see the schedule above in *Figure 16* for further information on the timeline.

- *Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete). Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation Regional or Area Office?*
 - GCID staff and Rubicon technicians will be available between October 2025 and October 2028 to prepare each site, install gates, and commission the gates at multiple sites simultaneously. District staff had an initial meeting with Keely Watland-Bakos, who is a natural resources specialist for the Bureau of Reclamation in the Region 10 Northern California Area office, regarding cultural and environmental compliance for the proposed project. The District understands that it will need to engage a consultant to meet cultural compliance requirements. The District plans on engaging such a consultant once it learns the status of its application and intends to meet all cultural compliance requirements as soon as possible, potentially prior to the award date. This District would directly fund this work and it is not included in the proposed project budget. See *Figure 16* above for a detailed project schedule.

Evaluation Criteria G – Collaboration

Please describe how the project promotes and encourages collaboration. Consider the following:

- *Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?*

- ❖ The GCID Board of Directors, which represents all District water users, understands the importance of increasing the District’s level of operational efficiency through increased system control and measurement. Water users in the District are very supportive of projects that improve the conveyance system’s efficiency as they understand that increasing system efficiency ultimately benefits all water users in the District because water deliveries will be more even throughout the District and more timely. At its meeting on November 7, 2024, the District Board of Directors reviewed this grant application and voted unanimously to authorize staff to submit the grant application.
- *What is the significance of the collaboration/support?*
 - ❖ The District is very large and the specific improvements proposed in this Project are only a portion of the system improvements that will be made over the next decade or more. Having support of projects that increase system control, measurement, and operational efficiency is critical for the District to effectively serve its water users in the future.
- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*
 - ❖ Yes, the introduction of automation within GCID’s service area, paired with the high level of automation, will likely increase regional interest and trust in implementing technological improvements in irrigation infrastructures.
- *Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?*
 - ❖ This project will benefit all downstream users, including municipal, industrial, recreational, and agricultural.
- *Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).*
 - ❖ Letter of support from the Northern California Water Association attached on page ##

Evaluation Criteria H – Nexus to Reclamation

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider:

- *Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?*
 - ❖ The District is party to an agreement with Reclamation titled ‘Contract Between The United States And Glenn-Colusa Irrigation District, Diverter Of Water From

Sacramento River Sources, Settling Water Rights Disputes And Providing For Project Water' (Settlement Contract), covering a term from 2005 through 2045. The agreement provides the District with a total of 825,000 acre-feet of water from April through October of each year (except when the supply is reduced under certain criteria due to drought).

- *If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?*
 - ❖ N/A
- *Will the proposed work benefit a Reclamation project area or activity?*
 - ❖ Completion of the project will provide additional operational flexibility to the Central Valley Project by reducing the District's diversions from the Sacramento River.
- *Is the applicant a Tribe?*
 - ❖ No, GCID is not a tribe.

Performance Measures

Pre-project quantification of benefits will be completed by evaluating historical flow data collected from the project canal. Headgates within the project scope do not currently have automated measurement and are, therefore, unable to produce data for comparison in an automated manner. After the headgates with automated measurement are installed and integrated into the SCADA system, the flow into the canal and the amount of water spilled will be compared to historical entries. Monthly post-project water balance values will also be compared to pre-project mass balances during the months without precipitation events to evaluate if a mass balance comparison can be used to evaluate the performance of the automated headgates, generally between June and October annually.

Project Budget

Funding Plan and Letters of Commitment

Please identify the sources of the non-Federal cost-share contribution for the project, including:

- *Any monetary contributions by the applicant towards the cost-share requirement and source of funds (e.g., reserve account, tax revenue, and/or assessments)*
 - ❖ GCID will fund its share of project costs with existing fund balance.
- *Any costs that will be contributed by the applicant*
 - ❖ GCID employees will be performing the majority of the work involved in the project. Also, existing GCID-owned equipment will be used in the course of the project.

Letters of Support



#SourcingOurSustainableFuture

455 Capitol Mall, Suite 703
Sacramento, CA 95814-4496
(916) 442-8333
www.norcalwater.org



November 8, 2024

Mr. Josh German
Bureau of Reclamation
Water Resources and Planning Office
Mail Code: 86-63000
P.O. Box 25007
Denver, Colorado 80225

RE: WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2024 and Fiscal Year 2025

Dear Mr. German:

The Northern California Water Association (NCWA) is pleased to support the Glenn-Colusa Irrigation District's (GCID) application for funding pursuant to the Bureau of Reclamation's WaterSMART Grants: Water and Energy Efficiency Grants program (Notice of Funding Opportunity No. R24AS00052) to implement strategic water efficiency improvements. NCWA is committed to advance the economic, social, and environmental sustainability of the Sacramento Valley by enhancing and preserving its water rights, supplies, and water quality for the rich mosaic of farmlands, refuges and managed wetlands, and meandering rivers that support fisheries and wildlife, and cities and rural communities in the region.

For more than one hundred years, GCID has been active in the management of water resources in the Sacramento Valley. GCID maintains a deep commitment to sustainable practices—both managing the water supply for productive agricultural uses and preserving and protecting the regional environment. The improvements identified in the grant application will provide GCID the ability to more effectively measure and control the water irrigating more than 26,000 acres of farmland and will allow GCID to conserve an annual average of more than 4,300 acre-feet of water. This will be achieved by:

- Installing automated and system-integrated measurement devices at eight locations where irrigation laterals branch off of the District's Main Canal.
- Installing automated and system-integrated water control gates that provide for measurement, flow control, and level control along and at the end of six irrigation laterals.

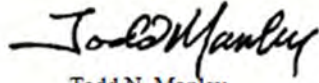
Water conserved as a result of the project will reduce GCID's need to divert water from the Sacramento River, allowing a greater volume of water to remain in the river than would absent the project and increasing the water supply for downstream uses. NCWA encourages the Bureau of Reclamation to fund GCID's valuable proposed project as it will result in significantly



Sourcing our sustainable future through responsible management of the essential resource that millions of birds, hundreds of thousands of fish, thousands of farms and millions of people all rely on—water!

improved water use efficiency and enhance GCID's ability to effectively manage water resources to provide multiple benefits.

Sincerely,

A handwritten signature in black ink, appearing to read "Todd N. Manley". The signature is fluid and cursive, with a large initial "T" and "M".

Todd N. Manley
Director of Government Relations