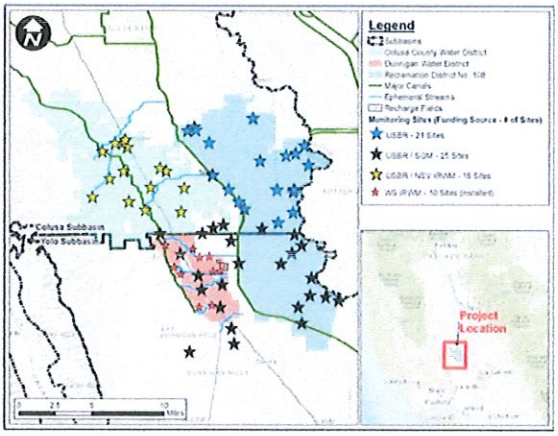
Title Page

Funding Opportunity: **WaterSMART – Applied Science Grants for Fiscal Year 2023 (Funding Opportunity Number: R23AS00446)**

Project Name: **RD108, CCWD, and DWD Groundwater Recharge Data Sharing and Modeling Improvements**



Applicant Name: Reclamation District No. 108
Physical Address: 975 Wilson Bend Road, Grimes, CA 95950
Applicant County, State: Colusa & Yolo Counties, California

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1 Executive Summary

Date: October 17, 2023

Applicant Name: Reclamation District No. 108

City, County, and State: Grimes, Colusa County, California

Reclamation District No. 108 (RD108), in partnership with Colusa County Water District (CCWD) and Dunnigan Water District (DWD), collectively "Districts", is pursuing grant funds through USBR's WaterSMART Applied Science Grants for Fiscal Year 2023 to improve access to and use of water resources data and to enhance modeling capabilities. Specific tasks include:

1. Expand DWD's existing groundwater monitoring network across RD108, CCWD, and adjacent lands solely reliant on groundwater (also known as 'white areas') in coordination with California Department of Water Resources (DWR);
2. Improve on-farm surface water delivery measurement programs;
3. Assess water management practices through updating existing water budgets and hydrologic models in coordination with Yolo Groundwater Sustainability Agency (YGSA) and Colusa Groundwater Authority (CGA); and
4. Disseminate project results including with the Westside Sacramento and Northern Sacramento Valley Integrated Regional Water Management (IRWM) Programs, Groundwater Sustainability Agencies (GSAs), and the Northern California Water Association.

All tasks (collectively referred to as the Project) will allow the Districts to enhance access to data and modeling capabilities in accordance with the Yolo Subbasin and Colusa Subbasin Groundwater Sustainability Plans (GSPs).[1] Project results will be used to inform regional groundwater recharge and conjunctive use programs. The Project is located within an area served by USBR's Central Valley Project (CVP). DWD and CCWD received state funding through the Westside Sacramento and Northern Sacramento Valley IRWM Programs, respectively, to plan, design, implement, and monitor groundwater recharge and conjunctive use projects. The IRWM programs work to strengthen coordination between county, regional, and statewide agencies to advance water resources management efforts in a unified approach. Additionally, DWD received state funding through the Sustainable Groundwater Management (SGM) Round 2 grant program. The WS and NSV IRWM funding and SGM grant will provide the minimum 25% or 50% cost-share requirement per USBR grant guidelines.

[1] Copies of the GSPs are accessible using DWR's SGMA Portal: https://sgma.water.ca.gov/portal/gsp/all

This Project is expected to begin in April 2024, or when given the notice to proceed, and be complete within two (2) years by September 2026. A final project report will be submitted in August/September 2026, or as agreed upon with USBR staff.

2 Technical Project Description

Reclamation District No. 108 is a 'Category A' applicant and is located along the western edge of the Sacramento River and delivers water to nearly 48,000 acres of farmland within southern Colusa County and northern Yolo County. RD108 receives water from the Sacramento River under riparian water rights, licenses for appropriation of surface water, and a Settlement Contract with the US Bureau of Reclamation. Additionally, CCWD's service area is approximately 46,000 acres and their existing contract with Reclamation provides for the annual delivery of up to 62,200 acre-feet of Central Valley Project (CVP) Water. DWD's service area is approximately 11,500 acres and their existing contract with Reclamation provides for the annual delivery of up to 19,000 acre-feet of CVP Water. CCWD and DWD are located adjacent to RD108 and have agreed to partner on this Project with RD108 being the single, local project sponsor to enter into an agreement with USBR.

Since October 2022, DWD partnered with landowners, C&H-3 Farms, and the Nature Conservancy to conduct a pilot project providing shorebird habitat and groundwater recharge. Excess surface water was diverted into dry ephemeral streambeds and fallowed farmland. The project showed successful habitat and recharge benefits and increased water supply reliability for the severely disadvantaged community of Dunnigan, which is entirely dependent on groundwater for potable water supply. CCWD is expected to start a similar recharge project in the Fall of 2023 while prioritizing in-lieu recharge. The success of DWD's pilot project and continued expansion of a similar recharge project into CCWD provided impetus to improve access to and use of water resources data to promote groundwater recharge in other regions and to enhance modeling capabilities to improve water supply reliability in a unified approach.

This Project consists of four (4) primary tasks as described below:

1. Expand DWD's existing groundwater monitoring networks across RD108, CCWD, and adjacent white areas in coordination with DWR;
2. Improve on-farm surface water delivery measurement programs in DWD and CCWD;
3. Assess water management practices through updating existing water budgets and hydrologic models in coordination with YGSA and CGA;
4. Disseminate project results including with the Westside Sacramento (WS) and Northern Sacramento Valley (NSV) IRWM Programs, GSAs, and the Northern California Water Association.

As of September 2023, DWD has installed ten (10) groundwater monitoring level sites, five (5) precipitation stations, and two (2) water quality sites across their service areas using funds awarded through the WS IRWM Program. Data is continuously collected and transmitted in near real-time to an online Stakeholder Portal to view and download data. Task 1 will expand

the number of monitoring sites into RD108, CCWD, and adjacent white areas. A total of 62 sites will be added as technically feasible. DWR was consulted during the development of this grant application to coordinate monitoring site installations. USBR grant funds will be used to add DWR monitoring sites into the Districts' online stakeholder portal, as feasible. Additionally, up to four (4) stream gauges will be incorporated into the monitoring network along Buckeye and Bird Creeks. Stage-discharge curves will be developed per USGS guidelines.

CCWD and DWD divert water from the Sacramento River through the Tehama-Colusa Canal to deliver water through piped conveyance systems to farms for irrigation purposes. Deliveries are measured using propeller and magnetic flow meters. District staff periodically (e.g., monthly) record totalizer readings for billing. Currently, the process to record water use is labor intensive and does not allow for information to be easily analyzed and shared among stakeholders and other interested groups. Task 2 will improve access to and use of on-farm surface water deliveries by automating the collection of meter readings and storing of the data in a Water Information System (WIS). District staff will record meter readings using an electronic device such as a smartphone, tablet and/or laptop. Records will be automatically sent via an internet connection to the WIS for further processing. Linkages between turnouts, fields, and customers will be developed in the WIS to provide customized summaries of water use. Through utilizing remotely sensed technology, such as OpenET, water managers will be able to quantify temporally and spatially distributed groundwater extraction estimates.

The data gained from Tasks 1 and 2 will be used to update existing water budgets and hydrologic models in coordination with the Yolo Subbasin Groundwater Agency and Colusa Groundwater Authority for compliance with the Sustainable Groundwater Management Act (SGMA) under Task 3. A data collection conceptual plan will be developed to identify methods to compile, store, and visualize the information. The Data Management System (DMS) will be used to perform water budgets at the field level to identify where and to what extent groundwater is being extracted. The DMS will be refined to automatically calculate and produce figures and/or maps of changes in groundwater storage. The hydrologic model will be improved with spatially distributed information and executed assuming current recharge projects will continue and be expanded in the long-term. Up to four (4) recharge scenarios will be modeled. Based on model results, water managers will use the information to help meet constraints or other requirements (e.g., declining groundwater levels, climate change impacts, and water delivery requirements).

Outreach materials will be developed under Task 4 to inform GSAs, landowners, and other stakeholders of Project success to promote groundwater recharge. Outreach materials include landowner flyers, coordination with Northern California Water Association, and outreach events through Integrated Regional Water Management Programs and GSAs. Up to four (4) stakeholder meetings will be held in coordination with the Districts.

3 Project Location

RD108, CCWD, and DWD are located within California's Sacramento Valley. RD108 and CCWD span across southern Colusa County and northern Yolo County. DWD is located entirely within northern Yolo County. The Districts strive to effectively and efficiently supply surface water to meet crop and environmental water demands. The proposed project is located across the Districts' service areas and adjacent white areas. Figure 1 shows the Project geographical location, identifies the Districts' service areas, and proposed monitoring sites.

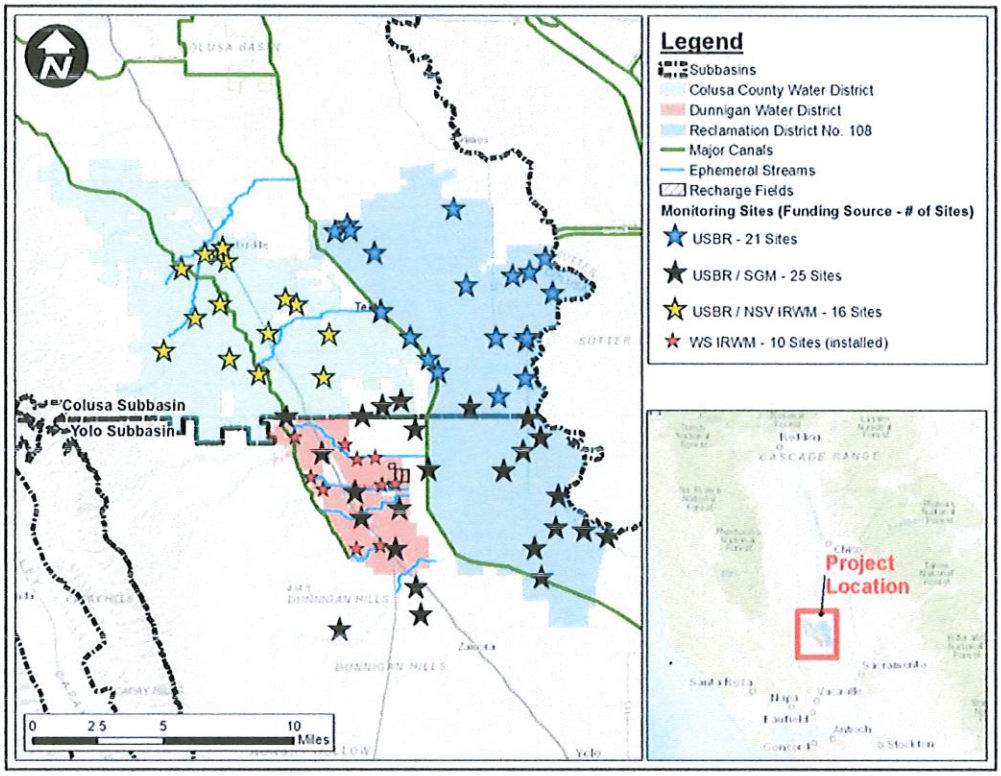

Figure 1. Project Geographical Location and Proposed Monitoring Sites.

4 Data Management Practices

Any spatially explicit data or tools developed in the performance of an award made under this NOFO will be developed in industry standard formats that are compatible with Geographic Information System (GIS) platforms, including shapefile, raster, and geodatabase formats.

5 Evaluation Criteria

5.1 Evaluation Criterion A—Water Management Challenge(s)

The Project will benefit ecological values and watershed health while having a nexus to water resources and water resources management as described in the following subsections.

5.1.1 Subcriterion No. A1: Water Management Challenges

The nature of California, with the maldistribution of water in time and place, coupled with seemingly more extreme weather events, suggests some new opportunities to advance a more

modern water management system that better adapts to climate change. California is experiencing extreme shifts between dry and wet years as evident through the 2019-2022 drought and 2023 wet year. The region must work towards providing a reliability water supply for municipal, agricultural, tribal, and environmental water uses including groundwater dependent ecosystems and inter-connected surface waters.

In 2022, more than 600 square miles of agricultural lands were left fallow (370,000 acres) due to the lack of surface water in the Sacramento Valley. CVP Contractors had a 0% allocation and senior water right holders were unprecedently curtailed to 18%. A report by Daniel Sumner and William Matthews from the University of California, Davis reported 14,300 jobs were lost, $1.3 billion in lost economic value, $732 million in lost labor income, and supply chain devastation occurred. Rural disadvantaged communities suffered economic dislocation and drinking water wells continued to go dry. There were significant impacts on the environmental landscape that supports more than 225 species including birds on the world-renowned Pacific Flyway, many of the state and federally listed species including the Giant Garter Snake (GGS), and habitat such as oak woodlands and elderberry.

In 2023, significant rainfall and snowpack filled California reservoirs and senior water right holders and CVP Contractors received a full surface water allocation. Portions of the State flooded that have not flooded in over 100 years. Despite the significant precipitation, groundwater levels are still at historically low levels which is threatening water supply for agricultural, domestic, and environmental users and causing land subsidence. The subsidence is damaging nearby infrastructure, including the Tehama-Colusa Canal and Interstate 5, both provide critical support for the agricultural industry and residents within the Sacramento Valley. Groundwater levels between the Fall of 2010 and the Fall of 2020 declined by over 55 feet in areas. DWR reports total subsidence between June of 2015 and July of 2022 up to -1.8 feet and eleven dry wells in the Project area with many dry wells going unreported to the State.

5.1.2 Subcriterion No. A2: Concerns or Outcomes if Not Addressed

The water management issues, described in Section 5.1.1.1, must be addressed otherwise residents, the economy, and environment will continue to suffer. Impacts may be far-reaching and irrecoverable if not addressed immediately. The Districts are committed to working with local, regional, and state agencies and stakeholders to ensure water management efforts advance to avoid undesirable results as specified in the Sustainable Groundwater Management Act (SGMA). SGMA is a California state law that mandates local agencies to develop and implement groundwater sustainability plans to avoid undesirable results and mitigate overdraft by 2042 otherwise the State will intervene.

5.1.3 Subcriterion No. A2: Methods to Address Water Management Challenges

As discussed in Sections 1 and 2, the Districts are actively implementing groundwater recharge and conjunctive use programs to address water management challenges. This Project will improve water management strategies by increasing access to data and improve hydrologic models to prioritize specific projects. This Project supports the following:

- **Water supply reliability for municipal, agricultural, tribal, and environmental water uses.**

This Project is expected to increase the elevation of the water table to sustain and re-establish available water supply and to allow for increased groundwater extraction without inadvertently affecting beneficial users including municipal, agricultural, tribal, and environmental water users. According to the Council on Environmental Quality's interactive Climate and Economic Justice Screening Tool (https://screeningtool.geoplatform.gov/en/), this area is primarily within Census Tracts 06011000100 and 06113011400 which are considered disadvantaged with a population of approximately 10,000. The adjusted percentage of individuals below 200% of the federal poverty line is about 30%. Residents are solely reliant on groundwater for drinking water. This region is home to the Cachil DeHe Band of Wintun Indians of the Colusa Indian Community and the Yocha Dehe Winton Nation which their traditional territory includes portions of Colusa and Yolo Counties. As mentioned in Section 5.1.1.1, the Sacramento Valley supports more than 225 species including migratory shorebirds on the world-renowned Pacific Flyway and groundwater dependent ecosystems. Projects will be implemented to achieve multiple benefits by strategically locating projects near densely populated areas and/or by flooding fields for recharge which also serves as habitat for migratory shorebirds.

- **Management of surface water deliveries.**

DWD and CCWD will improve access to and use of on-farm surface water deliveries by automating the collection of meter readings and storing of the data in a Water Information System (WIS). District staff will record meter readings using an electronic device such as a smartphone, tablet and/or laptop. Records will be automatically sent via an internet connection to the WIS for further processing. Linkages between turnouts, fields, and customers will be developed in the WIS to provide customized summaries of water use for landowners and water managers to use to inform decisions and management strategies.

- **Drought management activities.**

Groundwater recharge and conjunctive use activities will be identified and implemented to provide a critical groundwater elevation buffer for future droughts. Groundwater elevations will be monitored to assess groundwater-surface water interactions.

- **Conjunctive use of ground and surface water.**

This Project will increase access to surface water delivery and groundwater elevation data, water budgets, and hydrologic models which will be critical for successfully implementing conjunctive use of ground and surface water. Water budgets and hydrologic models will be performed to inform recharge strategies (i.e., in-lieu vs direct recharge), assist in prioritizing and selecting recharge sites by looking at historical and current groundwater extractions and stream-aquifer interactions.

- **Ability to meet endangered species requirements.**

This Project will benefit endangered species by providing additional habitat and sustain water supplies for the groundwater dependent ecosystems and inter-connected surface waters.

- **Use of nature-based features to reduce water supply and demand imbalances, the risk of drought and flood, and to increase water supply reliability for ecological values.**

DWD and CCWD are using dry ephemeral streambeds for recharge locations. Water will trickle flow into streams to mimic the natural process.

- **Conservation and efficiency.**

District staff, landowners, and stakeholders within all three districts will be able to view surface water application amounts by field. Targeted outreach events will be conducted to landowners to promote the use of surface water in areas with declining groundwater elevations.

5.2 Evaluation Criterion B—Project Benefits

5.2.1 Subcriterion No. B1: Need for the Project

This Project is being implemented in accordance with the Yolo and Colusa Subbasin GSPs, which are available on DWR's SGMA Portal.[23] As described in Sections 5.2 and 6 of the Yolo and Colusa GSPs, respectively, this Project addresses several key projects and management actions that are critical to achieving sustainability in the Subbasins including expanded monitoring networks, increased outreach and information sharing, groundwater model enhancements, and development of groundwater recharge and conjunctive use programs. The GSPs were submitted to DWR in January 2022 in accordance with the Sustainable Groundwater Management Act to prevent groundwater undesirable results (e.g., reduction of groundwater storage, lowering of groundwater level, subsidence, degraded water quality, and depletion of interconnected surface water). The GSP went through an extensive public review period as described in Sections 1.4.2 and 2.7.2 of the Yolo and Colusa GSPs, respectively. Specific commenter affiliations included local landowners, agricultural interest groups, local agencies/districts, non-governmental organization consortium (i.e., environmental interest groups), and U.S. National Marine Fisheries Service. The Districts were active participants during the GSP development process to identify potential projects to contribute to the sustainability of the Yolo and Colusa Subbasins.

5.2.2 Subcriterion No. B2: How and When the Information will be Applied

The Project will be completed within two (2) years of the award date. The information gained from this Project will be applied immediately to help implement Districts' ongoing groundwater recharge and conjunctive use efforts in addition to efforts being led the YSGA and CGA. Data

[2] California DWR SGMA Portal (Yolo Subbasin GSP) website: https://sgma.water.ca.gov/portal/gsp/preview/96
[3] California DWR SGMA Portal (Colusa Subbasin GSP) website: https://sgma.water.ca.gov/portal/gsp/preview/92

will be available in near real-time to inform policy and projects and management actions to be implemented by the Districts and other GSAs.

5.2.3 Subcriterion No. B3: Extent of Expected Benefits

The Districts along with the YSGA, CGA, Westside Sacramento and Northern Sacramento Valley IRWM Programs, and neighboring groundwater sustainability agencies and water suppliers will benefit from the Project. Letters of support are provided in Attachment B. The Project will monitor groundwater levels, improve access to surface water delivery measurement data, and refine existing hydrologic models and water budgets. The added information will be used to determine how groundwater extractions and management actions are impacting groundwater supplies, inter-connected surface waters, and groundwater dependent ecosystems. Policy decisions and projects and management actions will be refined accordingly based on project results.

This Project will provide a framework for other regions to track groundwater use. All work products (i.e., programming scripts, databases, GIS files, etc.) can be used as templates when transferring to other regions. Monitoring equipment will need to be purchased and installed in the field to incorporate additional sites into the groundwater monitoring network and online stakeholder dashboard. The Water Information System database for delivery measurement is transferable to other areas. Location specific information such as customer, turnout, and turnout-field linkages will need to be updated for that region. The hydrologic model is location specific; however, all scripts and databases used to populate the model input files are transferable to other regions using the same model. The Glenn Groundwater Authority (GGA) uses the same hydrologic model as CGA; consequently, GGA will benefit from the model enhancements included in this Project.

This Project addresses the water management challenges facing municipal, agricultural, tribal, and environmental water users including groundwater dependent ecosystems described in Section 5.1.2. The extent to which the project addresses the water management challenges are described in greater detail in Section 5.1.3.

5.2.4 Subcriterion No. B4: Overlap with Other Efforts

This Project will advance projects and management actions (PMAs) as outlined in the Yolo and Colusa GSPs. The Districts' coordinated with each GSA during the development of this application to ensure work products will complement ongoing efforts. Data will be formatted to align with past efforts by the GSAs to prevent duplication of efforts to ensure seamless integration into other GSA planning and implementation activities. The GSAs are required by California's Sustainable Groundwater Management Act to submit annual and 5-year reports to update DWR on implementation and benefits of PMAs occurring within the Subbasin including to groundwater dependent ecosystems and interconnected surface waters. The District will work with the GSAs to leverage their existing groundwater level monitoring network to track groundwater elevation trends and use their hydrologic model to project near- and long-term benefits of groundwater recharge.

As discussed in Sections 1 and 2, DWD and CCWD received state grants to implement the Dunnigan Area Recharge Program and the Arbuckle Area Groundwater Recharge Project, respectively. This Project will expand and join these Programs by incorporating them into one larger Program, available to both GSAs covering this area and the landowners within the three Districts. It will further increase access to other datasets and model enhancements and will enable the coordination between the two GSAs where they overlap with each other. The Districts included in this application are ideally suited and situated to address areas with problematic groundwater situations, specifically the Areas of Concern near Zamora and Arbuckle.

5.3 Evaluation Criterion C—Project Implementation Plan

5.3.1 Approach and Methodology

Consistent with Section 2 Technical Project Description, this Project consists of five (5) tasks as summarized below:

1. Project administration including progress reports, invoicing, and project management;
2. Expand DWD's existing groundwater monitoring networks across RD108, CCWD, and adjacent white areas in coordination with DWR;
3. Improve on-farm surface water delivery measurement programs in DWD and CCWD;
4. Assess water management practices through updating existing water budgets and hydrologic models in coordination with YGSA and CGA;
5. Disseminate project results including with the Westside Sacramento and Northern Sacramento Valley IRWM Programs, GSAs, and the Northern California Water Association.

The groundwater monitoring network, Task 2, will expand DWD's existing monitoring network into RD108, CCWD, and adjacent white areas. Well owners will be given the option to select between two styles of water level sensors. The first option is a standard pressure transducer/data logger sold by In-Situ, or equivalent, and are commonly lowered down the well casing suspended below the water surface above the pump impellers. These sensors measure the height of the water above the sensor. Alternatively, non-contact sensors, such as Eno Scientific equipment, may be used if it is preferred to not lower a sensor down the well casing. The sensor, positioned above the casing, sends sound waves down to estimate the distance to the water surface. Non-contact sensors are more commonly used for domestic and public supply wells to prevent contamination. Data will be incorporated into DWD's existing groundwater monitoring network as feasible. The monitoring network will be expanded in coordination with DWR to ensure all data is publicly available. DWR is actively working to develop a methodology to incorporate real-time data on their web dashboards. Sites will be added to DWR's website if feasible. Additionally, four (4) stream gages will be incorporated into the monitoring network along Buckeye and Bird Creeks. Stage-discharge curves will be developed per USGS guidelines. District staff will be trained in the long-term maintenance of the monitoring sites.

Task 3 will improve access to and use of on-farm surface water deliveries by automating the collection of meter readings and storing of the data in a Water Information System (WIS). District staff will record meter readings in the field using an application on an electronic device such as a smartphone, tablet and/or laptop. Records will be automatically sent via an internet connection to the WIS for further processing. Linkages between turnouts, fields, and customers will be developed in the WIS to provide customized summaries of water use. Through utilizing remotely sensed technology, such as OpenET or similar, water managers will be able to quantify temporally and spatially distributed groundwater extraction estimates.

Data from Tasks 2 and 3 will be formatted and incorporated into the GSAs' existing Data Management Systems (DMS) and hydrologic models to minimize the required effort and to ensure the information will be used to inform regional groundwater management efforts. The Yolo Subbasin DMS is discussed in Section 2.2.4 of the Yolo Subbasin GSP. The Colusa DMS is discussed in Section 7.9 of the Colusa Subbasin GSP. Refinements to the DMSs will be completed including developing an automated process to assess changes in groundwater storage and a summary of surface water and groundwater use at the field level. Data will be formatted to ensure the information can be easily incorporated into the YSGA Hydrologic Model and the refined C2VSIMFG-Colusa model discussed in Sections 2.3 and 3.3 of the Yolo and Colusa GSPs, respectively. Applicable documents from the GSPs will be updated to reflect the additional information.

5.3.2 Work Plan

The Project schedule shown in Figure 2 provides an estimate of the stages and duration of the proposed work, including task completion dates. Coordination with stakeholders will occur throughout the Project to ensure successful completion of each Task. The Districts intend to initiate groundwater level monitoring activities (Task 2) and on-farm delivery measurement improvements (Task 3) following execution of the grant award in April 2024 and be completed by December 2025. Hydrologic modeling and water budget enhancements are expected to be completed starting January 2025 through May 2026 once Tasks 2 and 3 are in progress. Dissemination of project results will start July 2024 and extend through the end of the Project. A final project report will be submitted by July 2026 or as specified by USBR. At least one Reclamation-sponsored webinar to disseminate deliverable(s) and discuss ways to apply deliverables to management questions will be held near the end of the Project. The Project will be completed by September 2026. A cost breakdown by task is available in Section 6.

Task	2024									2025												2026								
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Task 1. Project Management and Administration																														
Task 2. Monitoring																														
Task 3. On-Farm Delivery Measurement Improvements																														
Task 4. Hydrologic Model & Water Budget Enhancements																														
Task 5. Dissemination of Results																														

Milestone Date	Description
April 2024	Award Date
Summer 2024	Grant Agreement Execution
July 2026	Submit Project Completion Report
September 2026	Project Completion Date

Figure 2. Proposed Project Schedule and Milestones.

5.3.3 *Product Descriptions*

This Project is anticipated to develop data, metadata, digital and electronic applications, and reports. A combination of open source and purchased software such as Microsoft Office and ESRI ArcMap will be used to generate data, metadata, and reports. The Yolo and Colusa Subbasin GSPs and supporting documents will be used and heavily referenced as feasible to streamline work products. All data and metadata will be saved to a shared server hosted by the Districts.

Continuous water level data from the groundwater monitoring sites and stream flow will be collected, and information displayed on individual stakeholder data portals and DWR public websites as requested. Each water level site will contain metadata such as well type (e.g., monitoring well, irrigation, domestic), depth of well, screen interval(s), location (latitude and longitude), and well owner and contact information. Each stream gauge site will contain metadata such as stage-discharge relationship and location. Metadata will be collected using an application accessible using a smartphone, tablet, or computer. The application will be used to record manual groundwater depth measurements in the field and transmit the information to a database.

A Water Information System (WIS) database will be developed for DWD and CCWD. District staff will record meter readings using an application on an electronic device such as a smartphone, tablet and/or laptop. Records will be automatically sent via an internet connection to the WIS for further processing. Linkages between turnouts, fields, and customers will be developed in the WIS to provide customized summaries of water use. Technical manuals will be provided to the Districts to support use of the field equipment and WIS by district staff.

5.3.4 *Project Partners*

Reclamation District No. 108 will be involved in all aspects of the Project including processing invoices and progress reports to USBR. The Districts' General Managers will be responsible for engaging with the YSGA, CGA, and other stakeholders, as applicable, to coordinate with other local and regional activities. The Districts' managers participate in monthly meetings with their respective District Board of Directors, YSGA, CGA, and Tehama-Colusa Canal Authority. Additionally, the Districts are active participants with the Westside Sacramento and Northern Sacramento Valley IRWM Programs which have representatives from each County in the region in attendance. Districts will inform Project stakeholders of status, request input, and share results.

5.3.5 *Staffing*

The Districts' managers will serve as co-project managers on the Project and have a long history of collaborating on projects including the development of the Colusa and Yolo Groundwater Sustainability Plans. William Vanderwaal, RD108 Deputy Manager and DWD Manager, will serve as the primary contact with USBR and manage project support staff. He is a licensed Professional Engineer in the State of California. Shelly Murphy, CCWD General Manager, will oversee tasks conducted within CCWD. The Districts will request assistance from consultants to

implement Project tasks and manage day-to-day activities including generating progress and final reports. Consultants are licensed professional engineers, geologists, and hydrogeologists and are currently supporting similar activities within Colusa County Water District and Dunnigan Water District. The Project team is capable of proceeding with Project tasks immediately upon entering into a financial assistance agreement with USBR.

5.4 Evaluation Criterion D—Dissemination of Results

As discussed in Section 5.3.4, the Districts' managers with hired assistance will be responsible for engaging with the YSGA, CGA, and other stakeholders, as applicable, to coordinate with other local and regional activities. The District managers participate in monthly meetings with their respective District Board of Directors, YSGA, CGA, and Tehama-Colusa Canal Authority. Additionally, the Districts are active participants with the Westside Sacramento and Northern Sacramento Valley IRWM Programs which have representatives from each County in the region in attendance. Districts will inform Project stakeholders of status, request input, and share results as needed through presentations, flyers, and landowner letters. Other regional, state, and federal agencies including the Northern California Water Association, DWR, and USBR will be encouraged to participate in the Project success through meetings. At least one Reclamation-sponsored webinar to disseminate deliverable(s) and discuss ways to apply deliverables to management questions will be arranged. The Project team will schedule internal weekly meetings to ensure the Project remains on schedule and within budget while meeting the Project objectives.

Additionally, results will be disseminated through professional organizations such as Groundwater Resources Association of California, the California Irrigation Institute, and the U.S. Committee on Irrigation and Drainage through presentations and other technical publications.

5.5 Evaluation Criterion E—Presidential and DOI Priorities

5.5.1 Subcriterion No. E1: Climate Change

The Project is critical to achieving groundwater sustainability and will continue in perpetuity. According to climate change predictions, including the USBR Water Reliability in the West – 2021 SECURE Water Act Report, climate change will result in further extremes. More atmospheric rivers will occur in wet years bringing torrential rainfall and droughts that will last longer and become more intense. The intensity, timing, and frequency of storms will change. The Yolo and Colusa Subbasin GSPs report climate change is expected to bring the subbasin into continual imbalance impacting interconnected surface waters and GDEs if projects and management actions are not implemented. It is critical to the Subbasins and the region that new projects and management practices be implemented to promote conjunctive water management and capture and store excess surface water when available to endure periods of drought. The Project will give water managers the ability to ensure practices are sustaining groundwater supplies by tracking groundwater levels and developing strategies for the Districts

to ensure a public benefit under future climate conditions through adaptive management strategies including increasing direct and in-lieu recharge.

5.5.2 Subcriterion No. E2: Disadvantaged or Underserved Communities

As described in Section 5.1.3 of this application, this Project is expected to monitor the elevation of the water table and help sustain and re-establish available water supply and to allow for increased groundwater extraction without inadvertently affecting beneficial users including the communities which are completely reliant on groundwater for drinking water. According to the Council on Environmental Quality's interactive Climate and Economic Justice Screening Tool (https://screeningtool.geoplatform.gov/en/), this area is primarily within Census Tracts 06011000100 and 06113011400 which are considered disadvantaged with a population of approximately 10,000. The adjusted percentage of individuals below 200% of the federal poverty line is about 30%. Drought impacts are significant and extensive within this region, impacting residents. Local and regional governments do not have the financial resources to respond in a strategic and integrated manner to the extent that is needed. Without funding, this project will likely not be carried out, leaving local and regional governments to develop and complete smaller projects when and if budgets that have often already been stretched to fund essential services.

5.5.3 Subcriterion No. E3: Tribal Benefits

As described in Section 5.1.3 of this application, this Project is expected to monitor the elevation of the water table and help sustain and re-establish available water supply and to allow for increased groundwater extraction without inadvertently affecting beneficial users including tribal users. The Cachil DeHe Band of Wintun Indians of the Colusa Indian Community and the Yocha Dehe Winton Nation reside in Yolo and Colusa Counties. This Project supports Reclamation's Tribal trust responsibilities by preserving the land and environmental assets the Indian communities have long-time held.

6 Project Budget

The Districts are committed to providing the necessary administration and project management to successfully complete the project. Project management by the Districts will be provided as an in-kind contribution. A Resolution from DWD's Board of Directors can be immediately provided to the USBR upon request.

No funding will be requested or received from other Federal partners.

The Project's non-Reclamation share of project costs will be provided by three state grants. DWD received a state grant from DWR's 2021 Urban and Multibenefit Drought Relief Grant Program; it was awarded by the WS IRWM program. The grant agreement became effective June 11, 2022, and extends through March 2026. Additionally, DWD received a state grant from DWR's Sustainable Groundwater Management (SGM) Grant Program. An executed grant agreement is expected between November 2023 and January 2024 and extend through December 2026. Additionally, CCWD received a state grant under DWR's Round 2, Cycle 2 of

the Proposition 1 Implementation Grant Program; it was selected for funding by the NSV IRWM program. The executed grant agreement is expected to be completed Fall 2023 and extend through December 2027.

A summary of non-federal and federal funding sources is provided in Table 1. Per USBR guidelines a budget narrative was submitted with this application package. The total project cost is $1,145,950. A detailed budget is available in Attachment A.

Table 1. Summary of Non-Federal and Federal Funding Sources.

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. California DWR - DWR's 2021 Urban and Multibenefit Drought Relief grant (grant agreement term from June 11, 2022, to March 2026)	$100,000*
2. California DWR - DWD's SGM Round 2 Grant (executed grant agreement expected Nov. 2023 to Jan. 2024)	$427,950
3. California DWR - CCWD's Proposition 1 Grant (executed agreement expected Fall 2023)	$218,000
Non-Federal Subtotal	$745,950
REQUESTED RECLAMATION FUNDING	$400,000

*The anticipated amount of remaining budget at the time this grant is awarded by USBR.

7 Environmental and Cultural Resources Compliance

- **Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.**

The Project does not include any earth-disturbing work that will affect the air, water, or animal habitat in the project area.

- **Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?**

A Mitigated Negative Declaration and Initial Study was prepared for Reclamation District 108 in 2018 for a project. The report stated that the following threatened or endangered species or designated critical habitat are at risk: Elderberry Shrubs, Western Pond Turtle, Giant Garter Snake, Swainson's Hawk (and loss of habitat), special-status and non-special status birds (and loss of habitat), and Tree-Roosting Bats. The Project will have no impact on the threatened or endangered species or designated critical habitat.

- **Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States"? If so, describe and estimate any impacts the proposed project may have.**

There are no known wetlands or other surface waters inside the project boundaries that fall under CWA jurisdiction as "Waters of the United States".

- **When was the water delivery system constructed?**

The water delivery systems within RD108, DWD, and CCWD were constructed/formed in 1870, 1982, and 1954, respectively.

- **Will the proposed project result in any modification of, or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.**

No, the Project will not result in any modifications of, or effects to, individual features of an existing irrigation system. All existing features impacted by the Project are located on private property.

- **Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.**

No buildings, structures, or features in the District impacted by this project are listed or eligible for listing on the National Register of Historic Places.

- **Are there any known archeological sites in the proposed project area?**

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

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

The Project will not have a disproportionately high and adverse effect on low income or minority populations. The Project will benefit the disadvantaged communities near Dunnigan and Arbuckle, California.

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

No, the proposed Project will not limit access to and ceremonial use of Indian scared sites or result in other impacts on Tribal lands.

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

No, the proposed Project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

8 Required Permits or Approvals

Required permits and approvals for the proposed project are summarized in Table 6, along with a summary of the plan for obtaining permits and approvals.

Table 2. Required Permits and Approvals and Compliance Plan.

Agency/Permit	Applicability	Compliance Plan
U.S. Army Corps of Engineers Section 404 Permits	Not Applicable	N/A
Regional Water Quality Control Board Section 401 Water Quality Certification	Not required if exempt from USACE Section 404.	N/A
California Department of Fish and Game Section 1600 Streambed Alteration Permit	Not applicable. Project does not include modifications of natural waterways.	N/A
Regional Water Quality Control Board Waste Discharge Requirements and National Pollution Discharge Elimination System Permits	Not applicable. Project does not discharge wastewater.	N/A
State Water Resources Control Board Construction General Permit and Storm Water Pollution Prevention Plan (SWPPP)	Not Applicable.	N/A
State Historic Preservation Office (SHPO) and National Historic Preservation Act (NHPA) Section 106 Coordination	Required.	1. Support Reclamation staff in preparation of cultural resources report and SHPO consultation. 2. If necessary, hire consultant to complete study (not anticipated).
California Endangered Species Act (CESA) Consultation	Not Applicable.	N/A
Endangered Species Act (ESA) Compliance	Required.	1. Consult with Reclamation staff to determine need for study.

Agency/Permit	Applicability	Compliance Plan
Endangered Species Act (ESA) Compliance		2. If necessary, complete biological assessment. 3. Biological opinion not anticipated to be required.
National Environmental Policy Act (NEPA) Compliance	Required.	1. Identify Federal lead agency (likely Reclamation). 2. Prepare categorical exclusion or complete Environmental Assessment and FONSI.
California Environmental Quality Act (CEQA)	Not Applicable	N/A
California Department of Transportation or Local County or City Public Works Department	Not Applicable	N/A
Division of Dam Safety - Department of Water Resources	Not Applicable	N/A

9 Overlap or Duplication of Effort Statement

There is no overlap between this Project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel.

10 Conflict of Interest Disclosure

No actual or potential conflict of interest exists at the time of submission.

Attachment B: Letter of Support

Arbuckle Public Utility District

104 Fifth Street P.O. Box 796 or P.O. Box 207 Arbuckle, Ca 95912

Kevin Wood – Board President
John Lauppe – Board Secretary
Juan Diaz – Board Director

Office: (530) 476 – 2054
Fax: (530) 476 – 2761
apud@frontiernet.net

September 19, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Arbuckle Public Utility District is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. Groundwater levels in the Project area continue to decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

Financial assistance from the WaterSMART Applied Science Grant will improve accessibility and usability of water resources data and improve hydrologic models to forecast future scenarios and increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological values and is being developed as part of a collaborative planning process with the Westside-Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs. It will also enhance cross basin coordination between the Colusa Subbasin and Yolo Subbasin.

The Arbuckle Public Utility District asks that you approve this funding request.

Sincerely,

Plant Manager - A.P.U.D.

Arbuckle Public Utility District

WESTSIDE SAC IRWM
Integrated Regional Water Management Plan

September 13, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Westside Sacramento Integrated Regional Water Management Coordinating Committee (CC) is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. Groundwater levels in this area continue to decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

The WaterSMART-Applied Science Grant will be used to improve access to and use of water resources data and to improve hydrologic models to increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological values and is being developed as part of a collaborative planning process including with local groundwater sustainability agencies and the Westside Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs.

The CC prioritized the Dunnigan pilot groundwater recharge project for funding through California's Department of Water Resources and is committed to assisting this effort to build drought resiliency through groundwater recharge. The CC will continue to assist by identifying project collaborators, providing technical support, offering input throughout implementation of the Project, and seeking other areas where similar projects can be performed.

The Westside Sacramento IRWM CC asks that you approve this funding request.

Sincerely,

Christopher Silke

Chris Silke, Chair

County of Lake, State of California
Napa County Flood Control and Water Conservation District
Solano County Water Agency
WRA

DUNNIGAN WATER DISTRICT
P.O. BOX 84, DUNNIGAN, CA. 95937
530-437-2221
dunniganwater@gmail.com

October 12, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

Dear Grant Review Committee Members,

Dunnigan Water District is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. Groundwater levels in our and the other Districts service areas have continued to decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

Financial assistance from the WaterSMART Applied Science Grant will improve accessibility and usability of water resources data and improve hydrologic models to forecast future scenarios and increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological areas dependent upon groundwater and is being developed as part of a collaborative planning process with the Westside-Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs. It will also enhance cross basin coordination between the Colusa Subbasin and Yolo Subbasin.

Dunnigan Water District respectfully requests that you support this funding request that will help over 100,000 acres of farmland and several disadvantaged communities.

Thank you,

William Vanderwaal
General Manager
Dunnigan Water District

COLUSA COUNTY WATER DISTRICT

October 11, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Colusa County Water District (CCWD) is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. During the recent drought period groundwater levels in the Project area experienced a dramatic decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

Financial assistance from the WaterSMART Applied Science Grant will improve accessibility and usability of water resources data and improve hydrologic models to forecast future scenarios to increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological values and is being developed as part of a collaborative planning process with the Westside-Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs. It will also enhance cross basin coordination between the Colusa Sub basin and Yolo Sub basin creating opportunities to provide significant benefits to the region.

As a participating applicant, Colusa County Water District appreciates your consideration in approving funding of this Project that is vital not only to our local communities but region as a whole.

Sincerely,

Lawrence Rominger

Lawrence Rominger
Board President

SM

Post Office Box 337, Arbuckle, California 95912 • (530) 476-2669 or (530) 476-2784

Executive Officer

Yolo Subbasin Groundwater Agency
Groundwater Sustainability Agency

34274 State Highway 16 ▪ Woodland, CA 95695 ▪ 530.662.3211 ▪ www.yologroundwater.org

September 19, 2023

U.S. Bureau of Reclamation
Attn: NOFO Team, Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Yolo Subbasin Groundwater Agency (YSGA) is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. Groundwater levels in the Dunnigan Area continue to decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

Financial assistance from the WaterSMART Applied Science Grant will improve accessibility and usability of water resources data and improve hydrologic models to forecast future scenarios and increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological values and is being developed as part of a collaborative planning process with the Westside-Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs, the Colusa Groundwater Authority, and the YSGA. We are pleased that it will enhance interbasin coordination between the Colusa and Yolo Subbasins.

The YSGA respectfully requests your consideration of funding this important community Project.

Sincerely,

Kristin Sicke

Colusa Groundwater Authority

Groundwater Sustainability Agency

P.O. Box 475 | Colusa, CA 95932 | colusagroundwater.org

September 26, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Colusa Groundwater Authority is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. Groundwater levels in this area continue to decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

The WaterSMART-Applied Science Grant will be used to improve access to and use of water resources data and to improve hydrologic models to increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological values and is being developed as part of a collaborative planning process including with local groundwater sustainability agencies and the Westside Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs. It will also enhance cross basin coordination between the Colusa Subbasin and Yolo Subbasin.

The Colusa Groundwater Authority asks that you approve this funding request.

Sincerely,

Darrin Williams
Chairman

Glenn Groundwater Authority

Groundwater Sustainability Agency

225 North Tehama Street, Willows, CA 95988 | 530.934.6540

October 9, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Glenn Groundwater Authority is pleased to provide this letter of support for the combined Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods followed by extremely wet years. Groundwater levels in the Project area continue to decline, threatening water supply for domestic and agricultural groundwater users and causing ecological and watershed health concerns.

Financial assistance from the WaterSMART Applied Science Grant will improve accessibility and usability of water resources data and improve hydrologic models to forecast future scenarios and increase water supply reliability and flexibility in water operations. The Project will support existing programs to increase water supply reliability for ecological values and is being developed as part of a collaborative planning process with the Westside-Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs. It will also enhance cross-basin coordination between the Colusa Subbasin and Yolo Subbasin.

The Glenn Groundwater Authority asks that you approve this funding request.

Sincerely,

Gary Hansen
Chairman, Glenn Groundwater Authority

Tehama-Colusa Canal Authority

P.O. BOX 1025 • 5513 HWY 162, WILLOWS, CA 95988 • Phone: (530) 934-2125 • Fax: (530) 934-2355

October 4, 2023

Bureau of Reclamation
Attn: NOFO Team
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

RE: Support of the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District WaterSMART – Applied Science Grant Application

To Whom It May Concern:

The Tehama Colusa Canal Authority (TCCA) hereby provides its strong support for the Reclamation District No. 108, Colusa County Water District, and Dunnigan Water District - Groundwater Recharge Data Sharing and Modeling Improvements (Project). Climate variability has resulted in prolonged dry periods, followed by extremely wet years. Groundwater levels in our area have experienced a dramatic decline throughout recent drought cycles, threatening water supply for both domestic and agricultural groundwater users, while also causing ecological and watershed health concerns.

The aforementioned applicants for the WaterSMART-Applied Science Grant wish to utilize this opportunity to improve access to, and the use of, water resource data for the purpose of improving hydrologic models. Which in turn, can inform and shape improved water management actions to increase water supply reliability and operational flexibility. The Project is being developed in concert with other local and regional collaborative planning processes, including coordination with local groundwater sustainability agencies' efforts, as well as the Westside Sacramento and Northern Sacramento Valley Integrated Regional Water Management programs. Moreover, the Project will serve to enhance cross basin coordination between the Colusa Subbasin and Yolo Subbasin, creating opportunities to provide significant water supply and ecological benefits to the region.

In closing, the TCCA respectfully requests that this funding request be approved.

Sincerely,

Jeffrey P. Sutton,
General Manager
Tehama-Colusa Canal Authority