



- To Protect Our Groundwater
- To Prevent Seawater Intrusion
- Now & For Our Future

Pajaro Valley Water Management Agency

Real-Time Water Use Data Acquisition for the Coastal Distribution System

**Pajaro Valley
Santa Cruz and Monterey Counties
State of California**

July 31, 2018



Water SMART Grants: Small-Scale Water Efficiency Projects for FY'18

Funding Opportunity Announcement No. BOR-DO-18-F009

Real-Time Water Use Data Acquisition for the Coastal Distribution System

Pajaro Valley
Santa Cruz and Monterey Counties
State of California

July 31, 2018

*Applicant/Project Manager: Pajaro Valley Water Management Agency
Brian Lockwood, General Manager
36th Brennan Street
Watsonville, CA 95076
Lockwood@PVwater.org
Phone: (831) 722-9292
Facsimile: (831) 722-3139*

*Submitted to: Bureau of Reclamation
Attn: Matthew Reichert
Denver Federal Center, Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225*

Funding Opportunity Announcement No. BOR-DO-18-F009

Water SMART Grants: Small-Scale Water Efficiency Projects for FY'18

Table of Contents

Executive Summary	3
Background Data.....	3
Project Location	5
Technical Project Description	5
Evaluation Criterion A—Project Benefits.....	7
Evaluation Criterion B—Planning Efforts Supporting the Project	8
Evaluation Criterion C—Project Implementation	9
Evaluation Criterion D— Nexus to Reclamation.....	10
Evaluation Criterion E— Department of the Interior Priorities	10
Project Budget	11
Budget Narrative	11
Equipment	14
Materials and Supplies	14
Contractual	14
Environmental and Regulatory Compliance Costs.....	14
Other Expenses.....	14
Indirect Costs.....	14
Total Costs.....	14
Environmental and Cultural Resources Compliance.....	15
Required Permits or Approvals	15
Official Resolution	15
Unique Entity Identifier and System for Award Management.....	15

Executive Summary

The Pajaro Valley Water Management Agency (PVWMA) is pleased to submit this proposal to the U.S. Bureau of Reclamation (Bureau) on July 31, 2018 for the addition of remote telemetry equipment at metered turnouts on the Coastal Distribution System which delivers recycled water from the Watsonville Area Water Recycling Project (WAWRP). The WAWRP is located in the Disadvantaged Community of Watsonville, in Santa Cruz County, California.

Bureau funds will be used to deploy remote telemetry equipment on fifty-three metered turnouts that supply recycled water to farms from the WAWRP. The Bureau provided Title XVI funds to help construct this facility, which became operational in 2009. Currently the turnout meters must be read manually. The ability to acquire real-time water use data will improve water conservation with the ability to detect and therefore stop large leaks as well as prevent unauthorized or excessive usage. Flow through turnouts is currently measured with mechanical propeller meters. The telemetry technology proposed would integrate remote telemetry equipment directly into the meter registry as well as replace the mechanical register with a digital display for greater dependability of operation and accuracy of delivered data. Communications technology will be either cellular or satellite. A web-based server will deliver the data directly to the agency as well as irrigators for irrigation water management purposes. This project will take place over a two-year time period. This project will not be located on a federal facility.

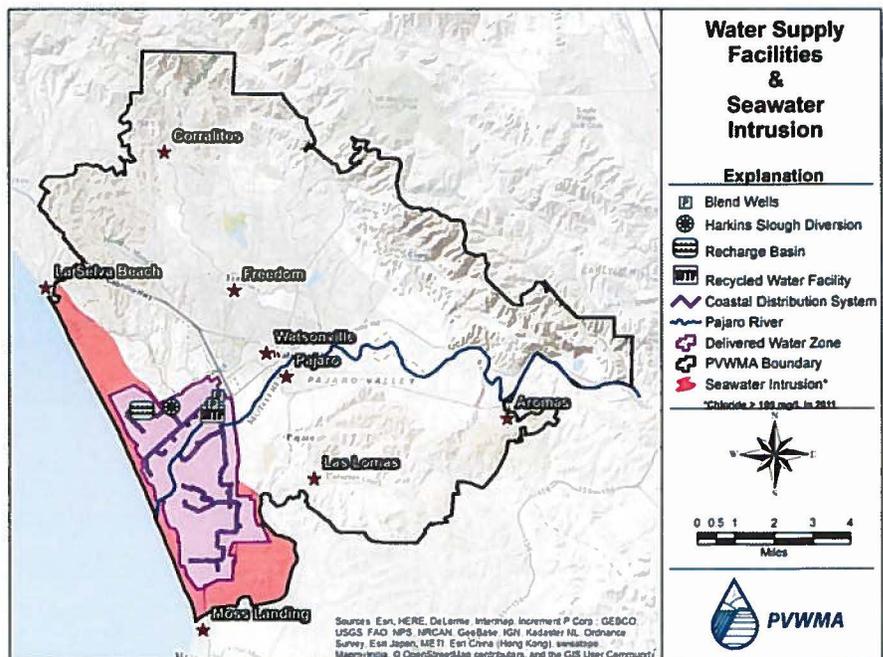
Background Data

The Pajaro Valley is a coastal valley that straddles southern Santa Cruz County and northern Monterey County. Located adjacent to Monterey Bay, the 120 square mile Pajaro Valley produces approximately \$900 million of conventional and organic, high-value fruit, vegetable, and flower crops annually on 28,000 irrigated acres. The Valley is bordered on the northeast by the coastal Santa Cruz Mountains and on the southwest by the Pacific Ocean. The northern boundary of the valley is generally considered to be the drainage divide between the Aptos Creek watershed and the Pajaro River watershed. The southern boundary of the valley is generally considered to be the drainage divide between Elkhorn Slough and Morro Coho Slough (Johnson et al., 1988). The PVWMA statutory boundary and the coastal area receiving deliveries of recycled water are shown on Figure 1.

Figure 1. PVWMA Boundary, Seawater Intrusion, and Delivered Water Zone

Seawater intrusion in the Pajaro Basin, a result of long-term groundwater overdraft, was first documented in 1953 (Bulletin 5, SWRCB). Since then, the problem has become more severe. The Pajaro Valley groundwater basin is in severe overdraft, causing groundwater elevations to drop below sea level. The lower groundwater elevations along the coast lead to seawater intrusion, further impacting the groundwater resources.

Seawater intrusion has caused chloride contamination of groundwater wells up to three miles inland as shown on Figure 1. Seawater intrusion is an immediate and direct threat to the



Pajaro Valley economy. The elevated chloride concentrations as shown on Figure 1 make the groundwater unusable for irrigation of the high value, salt sensitive crops in the coastal region of the Pajaro Valley. Lost agricultural production has an estimated annual value of approximately \$900 million and would result in the loss of approximately 12,000 jobs (BMP Update, PVWMA, 2014).

The Watsonville Area Water Recycling Project (WAWRP) was constructed with the support of Bureau of Reclamation Title XVI funds to produce up to 4,000 acre-feet per year (AFY) of recycled water for irrigation of high value food crops in the critically overdrafted Pajaro Valley. The project was constructed to help sustain the local high-value agricultural production and to help support over 12,000 jobs.

The Pajaro Valley Water Management Agency (PVWMA), in cooperation with the City of Watsonville, completed construction of the WAWRP in 2008. Facility operations began in 2009 with delivery of recycled water to agricultural water users in the coastal area of the Pajaro Valley. The WAWRP project consists of three primary components:

- Recycled Water Treatment Facility (RWTF) which provides high quality water from the City of Watsonville's wastewater treatment plant.
- Coastal Distribution System (CDS) which distributes the recycled water to farmers, allowing them to reduce groundwater pumping and thereby helping minimize seawater intrusion.
- Water Resources Center (WRC) which houses the staff and systems necessary to operate the RWTF.

The RWTF is designed to produce up to 4,000 AFY of recycled water every irrigation season. The recycled water is blended with up to 3,000 AFY of groundwater to increase the supply and meet water quality targets for irrigation of salt sensitive crops. Delivery of the blended recycled water to the coastal area allows agricultural water users to reduce pumping from the overdrafted groundwater basin and helps alleviate the seawater intrusion threatening the region's agricultural economy. Construction of a new 1.5 million gallon storage tank was completed in 2015 to improve system yield and operational flexibility.

The WAWRP is a completed cost-effective project that encompasses a watershed perspective to enhance regional water supply, improve environmental and water quality, promote energy efficiency, and provide benefits to this disadvantaged community. The RWTF and CDS work together to provide a sustainable water supply to the severely impacted coastal region of the Pajaro Valley and achieves multiple water supply objectives:

- Develops a reliable, drought tolerant, sustainable, local water supply;
- Reduces demand on the overdrafted groundwater basin;
- Helps protect the groundwater basin against seawater intrusion and protects the beneficial use of the groundwater;
- Reduces future dependence on CVP supplies; and
- Utilizes high efficiency equipment and renewable energy resources to treat and deliver the water supply.

The Coastal Distribution System delivers recycled water to agricultural water users through fifty-three (53) turnouts in the 8,000 acre CDS service area. The CDS consists of approximately 21 miles of transmission and distribution pipelines ranging in diameter from 8 to 42 inches. This area is home to what is considered one of the most fertile and ideal agricultural areas in the country and is well suited for a variety of crops. The trend has been an increase in growing the high value strawberries, vines, and bush berries, with a corresponding decrease in deciduous crops.

One shortfall of the current program is that PVWMA staff must manually read turnout meters in the CDS on a monthly basis. Water users are billed quarterly. When staff only visit a meter once a month and they find that a meter has malfunctioned, then staff must estimate water use which takes considerable staff time and can be inaccurate. This can be alleviated with the adoption of real-time telemetry. PVWMA plans to deploy telemetry equipment at each metered turnout to provide real-time water use data to the agency as well as the farmers. Real-time water use data will improve on-farm irrigation water management for farmers as well as management for the agency throughout the CDS. The delivery of real-time data will improve the accuracy of data received by the agency by eliminating human error and will streamline billing practices through improved record keeping. Real-time data will also alert the agency to meter issues which may be an indication of needed repairs or signal an on-farm line break and alert staff to shut off water to prevent leaks.

The PVWMA has had a successful working relationship with the Bureau of Reclamation in the past. Reclamation provided significant funding under the Title XVI Water Reclamation and Reuse Program in FY'15 to develop the WAWRP. This proposed project will build upon the success of the WAWRP by providing technology that will improve the water use efficiency in the PVWMA.

Project Location

As noted above, the Pajaro Valley is a coastal valley that straddles southern Santa Cruz County and northern Monterey County. The Valley covers approximately 120 square miles. The Valley is bordered on the northeast by the coastal Santa Cruz Mountains and on the southwest by the Pacific Ocean. The northern boundary of the valley is generally considered to be the drainage divide between the Aptos Creek watershed and the Pajaro River watershed. The southern boundary of the valley is generally considered to be the drainage divide between Elkhorn Slough and Morro Coho Slough (Johnson et al., 1988). The PVWMA agency boundary and the coastal area receiving deliveries of recycled water (Delivered Water Zone) are shown on Figure 1.

The Real-Time Water Use Data Acquisition for the Coastal Distribution System project will occur within the Delivered Water Zone (DWZ), which is illustrated in purple in Figure 1. The DWZ extends from approximately Sunset Beach, Santa Cruz County, CA in the north to Elkhorn Slough, Monterey County, CA in the south. The DWZ encompasses over 5,500 acres of irrigated agriculture. The DWZ is about 2 miles west of the City of Watsonville; Latitude: 36.910231 and Longitude: -121.7568946.

Technical Project Description

PVWMA Water System Operators deliver up to nearly 35 acre-feet per day (or over 11,000,000 gallons) on peak days at rates over 10,000 gallons per minute. Growers place water orders in advance, anticipating their needs, and operators match the demand with existing supply. Supplemental water delivered through the Coastal Distribution System reduces the volume of groundwater that growers extract to irrigate their crops in the areas most impacted by seawater intrusion.

Farm turnouts in the CDS, as noted in Figure 2, are currently metered with mechanical propeller flow meters. Existing propeller meters are Water Specialties vertical upflow meters. These meters will be upgraded with the addition of FlowConnect™ remote telemetry technology equipped with solar panels to operate free from commercial electricity. In addition, the FlowConnect™ remote telemetry units (RTUs) will be equipped with digital (rather than mechanical) registers. Digital registers have a decreased incidence of repairs which will provide more reliable data to the PVWMA and the water users of the CDS.

Figure 2. PVWMA Coastal Distribution System and Turnouts



The current metering program provides PVWMA with water measurement data, but presents a number of issues that can be resolved with this proposal:

- Manual meter reading is time consuming for agency staff and can create human errors.
- On-farm line breaks and unauthorized use can result in losses to the system, which can be addressed much faster and efficiently with real-time telemetry.
- Mechanical meter registers are more likely to malfunction than digital registers, which can and result in lost water use data
- Remote telemetry data can be used to streamline billing practices for the agency and stabilize revenue streams

FlowConnect also features ExactRead™ technology which ensures the flow reading on the meter’s register in the field and the data remotely viewed on the web are always the same. Flow data is generated and transmitted directly from the meter register which eliminates miscommunication of raw pulse data that can lead to confusion and result in poor data. With the data captured by these telemetry units, irrigators and

conservation partners will be able to use irrigation flow meters as wireless data collection tools for water conservation. Water managers can help reduce water consumption, optimize irrigation water applications, ensure water reporting accuracy, and meet scheduled allocations. The FlowConnect system provides battery operated wireless telemetry of flow data from McCrometer propeller meters as well as data from other sensors such as rain gages or pressure transducers. The FlowConnect system can be used with mechanical or digital registers and can be mounted on the meter or remotely. This project proposes the use of digital registers which will improve the data quality of the meter readings received by the agency. The FlowConnect system utilizes either cellular or satellite communication to transmit data to a web-based server where it can be accessed by the irrigator, PVWMA staff, or agency engineers for water management purposes. The FlowConnect system in PVWMA will operate with rechargeable batteries powered by a solar panel to facilitate more frequent communications.

Installation of the telemetry equipment will be conducted by local contractors and PVWMA staff. Estimates have been received by a local contractor (Maggiore Bros Well Drillers, Inc.) for the field work to install the equipment for this project. McCrometer technical support staff will provide training to the field installation staff prior to the deployment of equipment for this project. Installation will take place over a two year period. Roughly half of the RTUs will be installed each year over the two year span of the project primarily during the

“shoulder months” of the growing season. The peak water use months in the Pajaro Valley are May through September. The shoulder months are the months before and after (January, February, March, April, October, November and December) the peak water use months. During the shoulder months the irrigation demand is not as high as the peak months and consequently field staff will be able to incorporate the installation of the telemetry RTUs. December, January and February are the slowest months for water use in the PVWMA. At that time water demand comes from greenhouses and winter crops. The lower water demand in the winter allows staff time to conduct maintenance activities on the system.

The FlowConnect™ RTUs will be programmed to report water use data every 15 minutes, providing accurate and timely water use data to the valley for basin-wide distribution as well as farmers for on-farm irrigation management. Currently these meters must be read manually by PVWMA staff. This requires the dedication of a considerable amount of PVWMA staff time and resources including fuel and wear and tear on vehicles. In addition, when PVWMA staff reads meters and finds broken mechanical registers, this represents not only lost water use data and potentially lost revenue, but also additional time in the field to schedule work on the meter. As a result, staff needs to estimate water use based on average flow rates that the customer requested for each day. This is time-consuming and inaccurate for billing purposes. The addition of remote telemetry equipment will not only provide better data to the valley, but also provide an indicator of leaks, pipeline issues, or needed repairs to the meter.

Real-time water use data will be provided to the farmers via the web-based server to assist them with irrigation water management. Once the farmers have accurate real-time water use data, they will be able to match water use application to crop water use demands based on local evapotranspiration rates. Local evapotranspiration rates are available from CIMIS weather stations located within and near the CDS. Farmers also use the flow rate information from the meters to calibrate chemigation injectors. Real-time water use data will ensure to farmers that irrigation water as well as ag chemicals are being applied uniformly.

Evaluation Criterion A—Project Benefits

The addition of remote telemetry on farm turnouts will have several benefits to the distribution of recycled water in the WAWRP including improved water management on the farm as well as throughout the CDS, improved data accuracy on water use, and most importantly, reducing the reliance on local groundwater wells to reduce seawater intrusion in the Pajaro Valley.

The PVWMA is currently working with the Resource Conservation District of Santa Cruz County (RCD), the University of California Cooperative Extension, and independent consultants to implement a Basin Management Plan agricultural water conservation program and promote Irrigation Water Management (IWM) in the Pajaro Valley. PVWMA’s Basin Management Plan (BMP), contains a suite of projects and programs to bring the groundwater basin into balance and halt seawater intrusion. The PVWMA has partnered with the RCD and other partners to implement IWM Practices such as wireless soil moisture monitoring. PVWMA also provides technical support to growers to help them apply for funding through the NRCS EQIP to improve on-farm irrigation efficiency practices. The use of real-time water use data will assist with the implementation of these IWM practices once these priorities have been achieved.

Farmers are already using meters as irrigation management tools in the DWZ, however, real-time water use data will allow farmers to match water use application to crop water use demands based on local evapotranspiration rates. Local evapotranspiration rates are available from CIMIS weather stations located within the CDS. The PVWMA would like to improve the use of CIMIS data within the district for IWM and believes that real-time water use data will facilitate this. Farmers also use the flow rate information from the meters to calibrate chemigation injectors. Real-time water use data will ensure to farmers that irrigation water as well as ag chemicals are being applied uniformly.

Real time data will allow PVWMA to conserve supplemental water resources by providing water system operators (and the growers/irrigators themselves) the ability to identify, monitor, and stop large leaks or unauthorized or excessive use. On a few occasions tractors or other vehicles have broken pipelines on the farm which has resulted in significant water loss. Telemetry alarms will alert agency staff of such an event through increased flow rates or loss of pressure and enable them to respond quickly and to the correct location to close valves. This will not only conserve water, but also staff time that would be wasted driving the length of a lateral to find the break.

This proposal improves overall supply reliability of water from the WAWRP by improving distribution and application efficiency. The WAWRP produces up to 4,000 AFY of recycled water which is a reliable, drought tolerant, sustainable water supply. Since this project will improve the distribution of recycled water, it will continue to reduce groundwater pumping from an overdrafted groundwater basin. This project allows for conjunctive use and flexibility for improved groundwater management in the Pajaro Valley to limit further seawater intrusion in the Pajaro valley. Improved Irrigation Water Management also reduces future dependence on imported CVP supplies.

The implementation of real-time water use data will increase collaboration and information sharing among irrigators and water suppliers. Real-time data will improve the distribution of recycled water within the CDS to reduce groundwater pumping. Currently irrigators order water from the PVWMA which must be delivered by operations staff. Telemetry will provide visibility to what is actually used; excessive use, unscheduled use, or unused water, and provide water system operators the information they need in real-time to contact the user to resolve issues as they arise. More frequent water use data will alert PVWMA staff of lesser or greater demand sooner and they will be able to respond sooner to water demands. Water use data will also help with pump plant efficiency since unscheduled use, at times, requires the use of additional pumps that otherwise would not have been necessary. These applications of water use data will significantly reduce waste in the system improving supply reliability.

The project will have positive impacts on the local agricultural economy in the state-designated Disadvantaged Community of Watsonville, CA. It sustains high-value agricultural production with an estimated annual value of \$900 million on over 30,000 acres of agricultural land and maintains or supports regional agricultural employment of over 12,000 jobs.

The addition of water use data acquisition will modernize data collection for billing in the PVWMA. This will cut down on mistakes by eliminating human error. PVWMA currently bills by the acre foot. If the turnout meter is broken, then water use may continue without the knowledge of the agency for up to a month and therefore without billing for the usage. This project will improve the ability of the agency to capture water use records and seamlessly bill for usage thus supporting the operation and use of the RWTF.

Evaluation Criterion B—Planning Efforts Supporting the Project

The PVWMA Board of Directors adopted its first Basin Management Plan (BMP) and supporting Environmental Impact Report in 1999. The Board directed staff to revise the plan in 2002, and most recently, undertake a major update to the plan in 2010, which led to the adoption the BMP Update and certification of the BMP Update Environmental Impact Report in 2014. The most recent effort occurred over a four year period and was a stakeholder driven process. The Ad Hoc Basin Management Planning Committee (Committee) was composed of 21 stakeholders representing a wide variety of interests in the Valley including both the Monterey County and Santa Cruz County Farm Bureaus. Over a several year period, the Committee evaluated the state of the groundwater basin and 44 potential programs and projects to eliminate groundwater overdraft and halt seawater intrusion. Water conservation activities were at the forefront of these programs.

The Committee worked to address a 12,100 AFY shortfall in the water budget as determined by the Pajaro Valley Hydrologic Flow Model (Hanson et al., 2014). After two years of work, the Committee voted to save 5,000 AFY through a voluntary water conservation program, optimize existing water supply facilities to obtain 3,000 AFY, and develop 4,100 AFY of new supplemental water supplies. At just over 40% of the of the proposed solution, water conservation is the largest component of the plan. This project has been identified as a method that can achieve a significant portion of the water conservation needed in the Pajaro Valley.

Hydrologic modeling has shown that by reducing groundwater extractions in the coastal area, PVWMA can halt seawater intrusion. To keep farming viable in the coastal area while also working to reduce coastal groundwater extractions, PVWMA has been securing, producing, testing, and delivering supplemental water supplies for irrigation use.

PVWMA completed a Salt and Nutrient Management Plan (SNMP) in 2014 following a multi-year, stakeholder driven process. The SNMP evaluates the quality of water in the groundwater basin, the primary mechanisms for salt and nutrient flow into the basin, and strategies for managing salt and nutrient loading. The delivery and use of supplemental water resources is major component of the plan to stop seawater intrusion, and as a result, eliminate salt loading occurring through intruding seawater.

In 2014, Governor Jerry Brown signed into law the Sustainable Groundwater Management Act (SGMA), which requires that critically overdrafted groundwater basins such as the Pajaro Valley Groundwater Basin achieve sustainability by 2040. As a requirement of SGMA, Groundwater Sustainability Agencies (GSA) like PVWMA are required to work with stakeholders to develop Groundwater Sustainability Plans (GSP). SGMA allows for GSAs to submit an Alternative to a GSP, and the PVWMA Board of Directors provided direction to staff to submit the BMP, SNMP, and other supporting documents as an Alternative in 2016.

The Real-Time Water Use Data Acquisition for the Coastal Distribution System project will help staff achieve the goals set forth in the BMP, for the reasons below:

- Telemetry on meters supports BMP water conservation plans in that real-time data can be used as a tool by water users to increase irrigation efficiency, and leaks at turnouts or irrigation line breaks on farms can be detected immediately, preventing large amounts of water loss.
- Installing telemetry that reports real-time water usage will enable PVWMA operators to more efficiently deliver recycled water, which will help reduce need for groundwater pumping in the seawater intruded zone.
- Accumulation of accurate real-time data sets of irrigation events will be valuable resources for future basin management planning and conservation programs.

Evaluation Criterion C—Project Implementation

This project proposal will equip all of the mechanical flow meters at farm turnouts with the equipment necessary for real-time telemetry for remote monitoring of water use at each farm turnout. The agency has conducted an inventory of meters, line sizes, and serial numbers in order to develop a cost budget. The flow meter manufacturer has been contacted and a quote has been received for cost of the telemetry equipment to modify the existing meters for remote telemetry. No permits are required for this project. Prior to deployment of the RTUs, portions of the agency with poor cellular coverage will be evaluated through a site survey to determine needs for satellite placement or use of an external antenna.

Training will be conducted for installers by McCrometer Technical Support Staff to ensure the proper installation of the Flow Connect equipment. Field tests will be conducted at the beginning of installation to ensure accurate transmission of data. PVWMA staff will solicit bids from local contractors to perform the service of the flow meter telemetry equipment.

PVWMA staff plans to complete the upgrade of half of the meters in the first year (Spring, Fall and Winter of 2019), starting with the largest diversions in the CDS. The remaining meters will be upgraded for telemetry in the second year of the project (Spring, Fall and Winter of 2020). Installation will need to be scheduled with farmers during down-time. PVWMA staff plan to schedule installation in the 'shoulder months' of March, April, October and November and winter months of December through February.

Evaluation Criterion D— Nexus to Reclamation

The PVWMA has had success working with the Bureau in the past on water projects. The Watsonville Area Water Recycling Project (WAWRP) was approved for a \$20 million grant under the Bureau's Title XVI funding in P.L. 104-266. The PVWMA funded the construction of the WAWRP through a combination of a City of Watsonville loan and other state loans and grants. The PVWMA has demonstrated through past accomplishments the ability to cooperate with the Bureau as well as local partners such as the City of Watsonville and local irrigators to facilitate a successful federally-funded water project.

The WAWRP will reduce the PVWMA's future dependence on the Central Valley Project (CVP) entitlement by an equivalent 4,000 AFY. The PVWMA has a CVP entitlement of 19,900 AFY reserved for it by the Bureau. However, in 1992, Title 34 - CVP Improvement Act (CVPIA) (Public Law 102-575) became law. The CVPIA has several provisions that prohibit the USBR from entering into new water contracts until certain environmental goals are attained. It is expected to be several years before the Bureau fulfills these requirements. This has delayed negotiations with PVWMA for a new CVP contract for the 19,900 AFY entitlement. Due to the unmet CVP entitlement and the critical need to solve the groundwater basin overdraft and stop seawater intrusion, the PVWMA and the City of Watsonville collaborated on the WAWRP to deliver a local, sustainable 4,000 AFY water supply. The reduced future demand represents a 20% reduction (4,000/19,900 AFY).

Evaluation Criterion E— Department of the Interior Priorities

This project is an excellent example of utilizing science to have a positive effect on the management of natural resources - specifically water resources. The Watsonville Area Water Recycling Project (WAWRP) has proven over nearly ten years to be an effective method to meet irrigation water needs while addressing the serious problem of seawater intrusion in this coastal community. In recent years, remote telemetry technology has improved and become more economical to foster adoption in this application. The addition of remote telemetry equipment will improve the efficiency of the water management for the PVWMA as well as on-farm within the CDS.

The WAWRP has strived since its development to become and remain energy efficient. The Recycled water distribution pumps use premium efficiency motors (94.5 % efficient) driven by VFD's, and solar arrays provide up to 27% of the plant's total energy consumption. The telemetry equipment proposed for this project is 100% solar powered to represent no additional drain on the local power grid. This project may have the effect of reducing the consumption of electricity by further reductions of groundwater pumping in the Pajaro Valley.

Watsonville, CA is a state-designated disadvantaged community. This WAWRP has supported and maintained the water supply for 30,000 acres of irrigated land which supports over 12,000 local agricultural jobs. Maintaining the water recycling project by providing technology to water managers goes a long way to restoring trust between local communities and local, state, and federal agencies. Without the WAWRP

providing water to the valley, much of the agriculture and many associates jobs and families would be displaced.

Utilizing remote telemetry to acquire data from irrigation flow meters and other irrigation water management sensors will modernize the system. The PVWMA will enter into a public/private partnership with McCrometer, Inc. of Hemet, CA to upgrade existing water meters with remote data acquisition technology by providing technical support for the installation, troubleshooting field communications, and instructions with software and data management. The agency will no longer need to drive to irrigation turnouts to manually read water meters and then manually input data or management and billing purposes. Water users will have real-time access to water being applied to their fields. This will enable them to apply water as close as possible to the rate at which the crop uses it.

Project Budget

Budget Narrative

The projected budget for the proposed has total cost of \$169,016.25. The breakdown between Non-Federal funding and Federal funding is shown in Table 1, below.

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

Funding Sources		Funding Amount
Non-Federal Entities		
PVWMA		94,016.25
Other Federal Entities		
1. None		-
	Other Federal Subtotal	-
	Requested Reclamation Funding	75,000.00
	Total Study Funding	169,016.25

The budget detail is shown on Table 2, below. The proposed budget includes staff time for the General Manager, Brian Lockwood, and Water System Operator, Shinehah Bigham, for grant administration. The majority of staff time associated with this proposed project would be for the Water Meter Program Coordinator, Leonard Villanueva, who would have primary responsibilities pertaining to equipment procurement, contractor coordination, equipment installation, training, record keeping and diagnostics / data acquisition. Other personnel that would be involved in the project include Water System Operations Supervisor, Jesus Martinez, and Operations and Maintenance Technician, David Parra. They would participate in the equipment installation process and training activities. Table 4. below, provides the details pertaining to the tasks associated with each member of the team.

Table 2. Proposed Budget

Budget Item Description	Computation		Quantity Type	Total Cost
	\$/unit	Quantity	(hours/days)	
Salaries and Wages*				
General Manager	104.24	24	hours	2,501.67
Water System Operations Supervisor	66.37	24	hours	1,592.94
Water System Operator	63.32	52	hours	3,292.41
Water Meter Program Coordinator	49.28	235	hours	11,581.43
Maintenance & Operations Technician	47.73	48	hours	2,291.04
Subtotal				21,259.49
Fringe Benefits*				
General Manager	46.05	24	hours	1,105.14
Water System Operations Supervisor	33.77	24	hours	810.52
Water System Operator	20.58	52	hours	1,070.12
Water Meter Program Coordinator	28.40	235	hours	6,673.63
Maintenance & Operations Technician	29.80	48	hours	1,430.35
Subtotal				11,089.76
Travel				
None				0
Subtotal				-
Equipment				
Flow Connect Telemetry Modules	1,471.00	53	ea	77,963.00
Satellite Option*	185.00	6	ea	1,110.00
Subtotal				79,073.00
Supplies and Materials*				
Cellular Antennae Extension	105.00	6	ea	630.00
Masts	20.00	53		1,060.00
				-
Subtotal				1,690.00
Contractual/Construction*				
Diagnostics and Data Acquisition	152.00	26	Yr #1	3,952.00
Diagnostics and Data Acquisition	152.00	53	Yr #2	8,056.00
Training	1,350.00	2	days	2,700.00
Maggioria Bros Drilling, Inc. rig without crane	540.00	33	ea	17,820.00
Maggioria Bros Drilling, Inc. rig with crane	900.00	20	ea	18,000.00
Gutierrez Consultants, Inc. (Grant Admin)	224.00	24	hours	\$5,376
Subtotal				55,904.00
Total Project Costs				\$169,016.25

* Potential Matching Funds

PVWMA would utilize \$75,000 in grant funds to purchase 53 Flow Connect Telemetry Modules at a cost of \$1,471 each for a total of \$77,963. PVWMA would pay for the balance of the Flow Connect Telemetry Modules (\$2,963), the costs of supplies and materials (\$1,690), and contractual / construction costs (\$55,904) for a total \$61,667.00. PVWMA proposes to use staff time and in-kind match contribution. The projected

value of staff time salaries and wages is \$21,259.49, and fringe benefits is \$11,089.76, for a total in-kind contribution of \$32,349.25.

Of the total project cost, PVWMA would cover \$94,016.25, or 55.6% and the grant would cover \$75,000 or 44.4%.

PVWMA’s primary sources of revenue include an augmentation charge on groundwater production and delivered water sales. Other sources of revenue include management fees, interest income, grant income, and other income. Audited financial statements reflect the revenue as follows during fiscal year ending June 30, 2017 as shown in Table 3. Special revenue funds in combination with in-kind contributions through staff time will be used to meet the non-Federal share of costs.

Table 3. PVWMA Revenues from Audited Financial Statements

Fiscal Year Ended June 30, 2017	General Revenue	Special Revenue
Management Fee	\$383,998	
Augmentation Charges		\$9,080,219
Interest Income	\$10,630	\$42,424
Water Sales		\$1,371,994
Grant Income		\$3,327,582
Other Income		\$56,618
Total Revenues	\$394,628	\$13,788,837

Table 4a. Proposed Staff Hours and Tasks

	General Manager (GM)	Water Systems Operations Supervisor (WSOS)	Water System Operator (WSO)	Water Meter Program Coordinator (WMPC)	Operations and Maintenance Technician (OMT)
Grant Administration	16		16		
Equipment Procurement/Tracking				8	
Contractor Coordination (McCrometer/Maggiora)			8	4	20
McCrometer Training			8	8	16
Equipment Installation*			8	8	159
Meter Record Keeping				8	
Diagnostics and Data Acquisition	8		16	24	
Total Hours for two-year project	24	24	52	235	48

PVWMA's contribution to the cost-share requirement will come from the augmentation charge and water sales (special revenue fund) as noted above. Grant administration and compliance with reporting requirement will be overseen by the General Manager and completed by a combination of the Water System Operator and Gutierrez Consultants, Inc., PVWMA's long-time grant administrator. Gutierrez Consultants, Inc., supported PVWMA with the \$20 million Title XVI grant that was awarded to help fund the construction of the Recycled Water Facility.

Certification of Labor Rates The labor rates provided above are taken from the Board of Directors approved and adopted budget for the fiscal year ending June 30, 2019. The rates for fringe benefits are pulled from the same Board adopted budget.

Equipment

The equipment necessary for this project includes 53 Flow Connect Telemetry Modules at a cost of \$1,471 each for a total of \$77,963, and 6 devices that allow for a satellite option (if cellular service is not available at some sites) at a unit cost of \$185 for a total of \$1,110.

Materials and Supplies

The materials and supplies needed included 53 masts at \$20 each for a total of \$1,060, and 6 cellular antenna extensions at a unit cost of \$105 each for a total of \$630.

Contractual

As shown on the Table 2, above, Contractual work accounts for \$55,904.00 in the proposed budget. Diagnostics and Data Acquisition provide the real-time service and allow for data to be stored and accessed on the cloud. Two days worth of training are budgeted at a total cost of \$2,700 and is a necessary component of the project. While staff will oversee and assist with the activities necessary to replace the existing meters with the telemetry meters, additional support is required. Staff have requested a quote from a local well and pump contractor, Maggioria Bros. Drilling, Inc. to assist the work at 53 sites. Staff have determined that 20 sites will require a rig with a small crane that will be used to lift the meter from the turnout. The total estimated cost for Maggioria Bros. Drilling, Inc. is \$35,820. Staff also utilize the support of Gutierrez Consultants, Inc. for grant administration professional services. Staff projects 24 hours of support from Gutierrez Consultants, Inc. to complete a minimum of two annual reports and one final report (8 hours each).

Environmental and Regulatory Compliance Costs

The WAWRP and CDS construction is complete and the project is operational. The PVWMA obtained all environmental compliance documentation as required and the CEQA and NEPA compliance is complete.

The Environmental Impact Report (EIR) for the project was completed in October 2001. A copy of the completed EIR is available on the PVWMA website at www.pywater.org. The Environmental Impact Statement (EIS) for the project was completed in August 2003. A copy of the completed EIS is also available on the PVWMA website. No additional environmental documentation is required for the installation of telemetry units at the turnouts.

Other Expenses & Indirect Costs No other expenses are anticipated.

Total Costs The total estimated cost for this project is \$169,016.25, with \$75,000 or 44.4 % coming from the Federal cost share, and \$94,016.25 or 55.6% coming from the non-Federal (PVWMA) cost share.

Environmental and Cultural Resources Compliance

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

The WAWRP and CDS construction is complete and the project is operational. The PVWMA obtained all environmental compliance documentation as required and the CEQA and NEPA compliance is complete.

The Environmental Impact Report (EIR) for the project was completed in October 2001. A copy of the completed EIR is available on the PVWMA website at www.pvwater.org. The Environmental Impact Statement (EIS) for the project was completed in August 2003. A copy of the completed EIS is also available on the PVWMA website.

Staff and contractors will utilize existing farm roads to access the turnouts. Minor dust disturbance may occur when driving on dirt roads. The work does not include earth-disturbance.

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? The project area where the meters are located is regularly accessed by tractors and other heavy equipment used for farming operations. There are no anticipated impacts to any endangered or threatened species, wetlands, archaeological sites, low income or minority populations, or Indian sacred sites as the meters are located in agricultural fields.

The meters are located in agricultural fields. No work will take place in wetlands.

When was the water delivery system constructed? Most sections of the CDS were constructed between 2000 and 2009, with an additional branch completed in 2015.

There are no proposed modifications or anticipated impacts to irrigation systems, buildings, historic places archeological sites. The will not affect high and adverse effect on low income or minority populations, nor will it limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands

Required Permits or Approvals

The permitting tasks associated with construction and operation of the WAWRP and CDS are complete. Permits obtained include the Santa Cruz County permits, Department of Public Health (DPH) permits, and Regional Water Quality Control Board (RWQCB) permits. No new permits or other approvals are necessary for this project. PVWMA owns the appurtenances and the meters. No ground disturbance is necessary to complete the proposed project.

Official Resolution

The PVWMA Board of Directors is aware and in support of this grant proposal and resolution requirement. The Board is scheduled to meet on August 22, 2018 to approve a resolution that meets the grant proposal requirements.

Unique Entity Identifier and System for Award Management

The SAM number will be provided within 30 days of the proposal deadline.