WaterSMART Water and Energy Efficiency Grants for FY 2018

San Gabriel Valley Municipal Water District Regional Smart Meter AMI/AMR Project for 2018

Bureau of Reclamation FOA No. BOR-DO-18-F006

May 10, 2018

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List of Acronyms

AF	Acre-feet
AFY	Acre-feet per year
AMI	Automated Metering Infrastructure
AMR	Automated Meter Reading
AWWA	American Water Works Association
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CIS	Customer Information System
CO2	Carbon dioxide
CVP	Central Valley Project
CWC	California Water Code
Delta	Sacramento-San Joaquin Delta
District	San Gabriel Valley Municipal Water District
DMM	Demand Management Measures
DWR	Department of Water Resources
FCC	Federal Communications Commission
FOA	Funding Area Announcement
GLAC	Greater Los Angeles County
GPCD	Gallons per capita per day
IRP	Integrated Resources Plan
kWh	Kilowatt hour

MDMS	Meter Data Management Software
MWD	Metropolitan Water District of Southern California
MWh	Megawatt hour
NEPA	National Environmental Policy Act
Reclamation	Bureau of Reclamation
RFP	Request for Proposal
SGVMWD	San Gabriel Valley Municipal Water District
SWP	State Water Project
UWMP	Urban Water Management Plan

Appendices

Section 1: Technical Proposal

1.1 Executive Summary

Date: May 10, 2018

Applicant Name: San Gabriel Valley Municipal Water District

Applicant City, County, State: City of Azusa, Los Angeles County, California

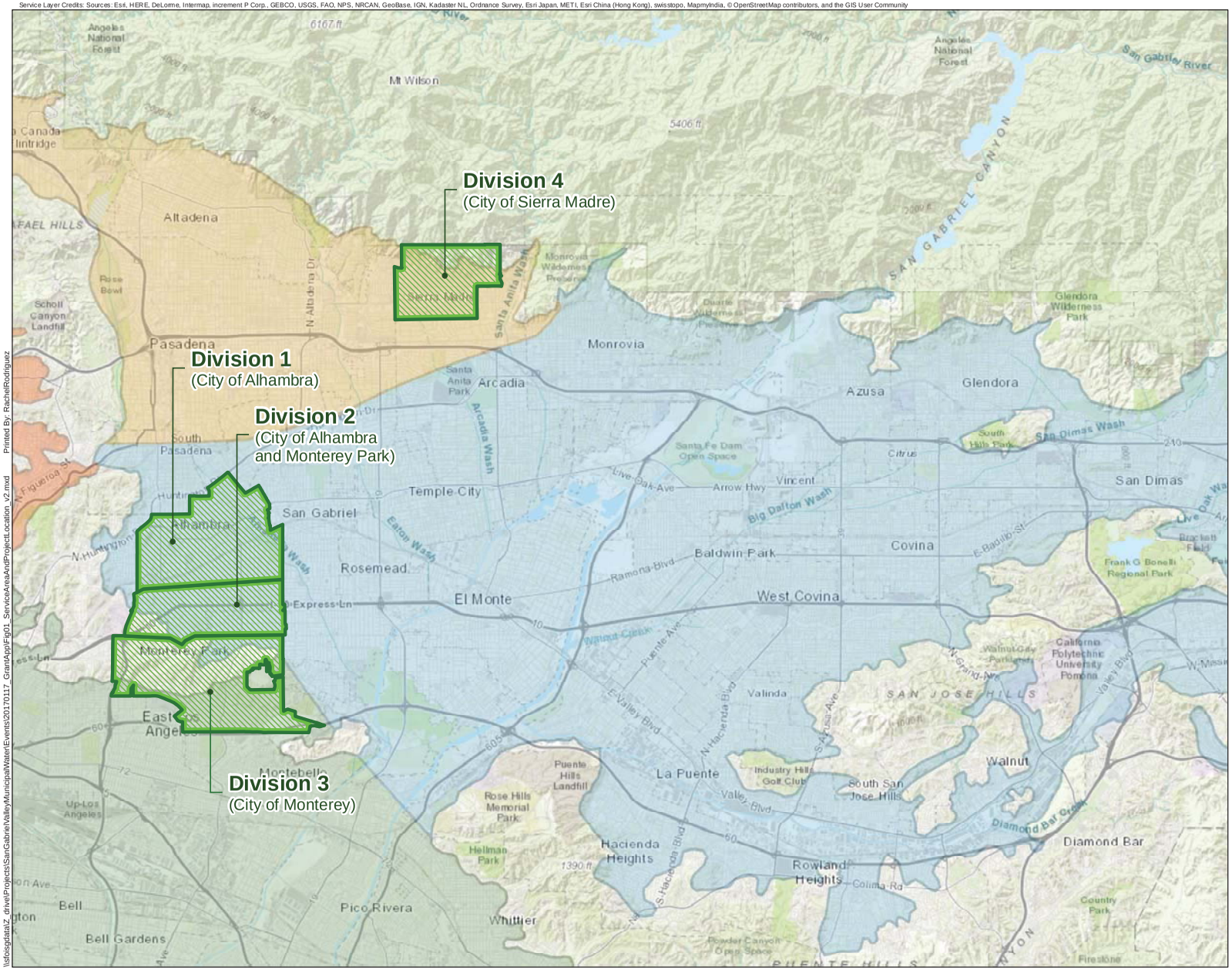
Project Title: Regional Smart Meter AMI/AMR Project

The San Gabriel Valley Municipal Water District (SGVMWD, District) is seeking grant funding for the San Gabriel Valley Municipal Water District Regional Smart Meter Advanced Metering Infrastructure (AMI)/Automatic Meter Reading (AMR) Project (Project) to assist three of SGVMWD's retail member agencies: the Cities of Alhambra, Monterey Park, and Sierra Madre in upgrading water meter infrastructure with AMR and/or AMI technology. This regional effort will help improve water supply reliability by reducing overall demand, increasing water use efficiency and improving overall water management on a large scale by providing highly accurate, real-time meter reading capabilities and enhanced customer awareness. Implementation of this project will enable leaks and unusual water usage to be immediately identified and addressed. Individual customers will have access to a secure portal where they can view and track their demand to further improve water conservation and water use awareness. Funding will be used by participating agencies to upgrade/replace a total of 2,975 water meters at residential, commercial, and landscape sites, which is expected to result in water savings of 166 acre-feet per year (AFY), associated energy savings of 596,517 kilowatt hours (kWh) per year, and will avoid greenhouse gas emissions of approximately 194 tons of CO2 per year. The project will significantly contribute to conservation of the region's limited water supplies and help improve local supply reliability. With the recent drought conditions and decreased reliability of imported water supplies, conservation and water use efficiency are key factors for improving water sustainability within the region.

This project is consistent with, and contributes to, the WaterSMART Water and Energy Efficiency Program goal of producing quantifiable and sustained water savings to support broader water reliability benefits. It is specifically a 'municipal metering' project as identified on page 9 of the Funding Opportunity Announcement (FOA).

The project will be completed within 2 years of grant award.

The Project will not be located on a Federal facility. Figure 1 provides an overview of the project location within the District's service area.



Legend

- SanGabriel Valley Municipal District Boundary

Groundwater Basin

- Coastal Plain Of Los Angeles
- Raymond Basin
- San Fernando Valley
- San Gabriel Valley

N

0 1 2
Miles

Kennedy/Jenks Consultants

San Gabriel Valley Municipal Water District
Azusa, California

San Gabriel Valley Municipal Water District Service Area and Project Location

K/J 1644240.00
May 2018
Figure 1

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1.2 Background Data

1.2.1 Description of Applicant

SGVMWD is a wholesale water supplier that imports water from the State Water Project (SWP) to meet the supplemental water needs of its four retail agencies: the cities of Alhambra, Azusa, Monterey Park, and Sierra Madre. SGVMWD's service area extends over 27 square miles within the San Gabriel Valley, located in southeastern Los Angeles County. As of 2015, the combined population of its member agencies was estimated at 262,741 persons.

The project will be implemented across the service areas of three of the District's retail agencies: Alhambra, Monterey Park and Sierra Madre. Figure 1 shows the boundary of SGVMWD and project location.

1.2.2 Water Supplies and Demands

SGVMWD's sole source of water supply is SWP water, which it recharges to the Main San Gabriel Basin on behalf of its member agencies. SGVMWD supplies water for groundwater replenishment to fulfill Replenishment Water obligations under the 1959 Long Beach Judgment and Main Basin Judgment. Per the Main Basin Judgment, water extracted in excess of the operating safe yield (established by the Watermaster) incurs a replenishment obligation. When District member agencies extract groundwater from the Main Basin in excess of their annual right this becomes a demand that the District must meet using imported water. SGVMWD's SWP allocation is 28,800 AFY, however availability is highly dependent on hydrologic conditions, among other factors and SWP supplies vary from year to year. Between 2010 and 2015, the amount of SWP water purchased by SGVMWD averaged 13,500 AFY.

In 2015, the total volume of SWP supplies purchased and recharged by SGVMWD was 5,753 AF. Based on the SWP Delivery Capability Report, the availability of supplies to SGVMWD is projected to range from 11 to 62 percent of its SWP allocation. In drought years the allocation from the SWP can drop dramatically requiring the member agencies to rely on their other local supplies and curtail demand. Water use efficiency is crucial for sustainably using existing supplies and ensuring that SGVMWD and its member agencies will be able to continue reliably meeting demands.

Projected water demands on SGVMWD are based on member agencies' supplemental water requirements. Supplemental water requirements are in turn based on estimates for projected water use less each member agency's annual groundwater production rights and rights to other sources. Table 1 shows projected water supplies available to SGVMWD and demands on the District through 2040.

TABLE 1. PROJECTED WATER SUPPLIES AND DEMANDS

	2020	2025	2030	2035	2040
SGVMWD Supplies [(a)]	17,856	17,856	17,856	17,856	17,856
SGVMWD Demands [(b)]					
City of Alhambra	1,110	1,110	1,433	1,776	2,121
City of Monterey Park	2,172	2,204	2,655	3,127	3,620
City of Sierra Madre	5,000	5,000	5,000	5,000	5,000
Total Demand	**8,282**	**8,314**	**9,088**	**9,903**	**10,741**

Notes:
a) Based on average year SWP reliability projections.
b) Supply and demand data from 2015 Urban Water Management Plans. Alhambra demands also include 1,110 AFY from the Alhambra Cooperative Water Exchange Agreement with SGVMWD.

Within the SGVMWD service area there are approximately 60,700 service connections, which are maintained by its member agencies. All connections are currently metered. Information on the member agencies participating in the proposed project is provided in the following.

The two main factors of concern for SGVMWD in providing water for its member agencies are climate and population. As a region that uses groundwater as its primary source, less rainfall combined with an increased population means less natural replenishment, less SWP reliability, and increased demand on groundwater. As a result, SGVMWD works closely with its member agencies to keep up to date on population statistics, to support water conservation efforts in their respective service areas, and also with DWR with regard to SWP reliability.

City of Alhambra

The City of Alhambra currently serves 18,558 service connections, of which residential connections make up nearly 90%, with some commercial, industrial and institutional demand. Total demand in 2015 was 9,972 AFY. The City meters all service connections in its distribution system and maintains them through its computerized billing system. The computerized billing system will flag any meter which registers a variation from its normal demand, thereby helping to identify leaks or faulty meters. To date, the City of Alhambra has replaced the majority of its meters with electronic touch-

read meters, which increases meter reading efficiency and accuracy, in addition to facilitating water consumption monitoring.

The City of Alhambra's water supply consists of groundwater pumped from the Main San Gabriel Basin and water delivered from the Metropolitan Water District of Southern California (MWD) through an exchange agreement.

City water losses have been estimated at 6% of total water use, on average.

City of Monterey Park

The City of Monterey Park serves approximately 95% of the residents of the City of Monterey Park. The City serves 15,230 connections. In 2016, the City supplied 2,447 AFY of potable water, nearly 90% of which was for residential purposes. All accounts are metered and the City has been implementing a program to replace manual read meters with AMR meters. To date, the City has replaced all meters of 2 inches and smaller with AMR meters. This replacement program has already proven to have significant potential for water savings.

The City's primary source of water supply is groundwater pumped from the Main San Gabriel Basin.

City water losses were 20% in 2016, or 405 AF.

City of Sierra Madre

The City of Sierra Madre provides water to 3,969 metered connections, 95% of which are residential and the remainder being commercial, institutional, industrial. In 2016, the City provided 2,058 AF. The City meters all customer connections.

Sierra Madre water supplies consist of local groundwater, surface water from the Little Santa Anita Canyon, and imported water from MWD, through an agreement with SGVMWD. For every 1 AF Sierra Madre obtains from MWD, SGVMWD must replenish 2 AF to the Main Basin.

City water losses were 6% in 2016, or 140 AF.

1.2.3 Water Rights

The management of water resources in the Main San Gabriel Basin is governed by a Watermaster and two separate court judgments: The Long Beach Judgment and the Main Basin Judgment. The Long Beach Judgment established the River Watermaster, and the Main Basin Judgment established the Basin Watermaster. Through the Long Beach Judgment and the Main Basin Judgment, operations of the Main Basin are optimized to conserve local water to meet the needs of the parties of the Main Basin Judgment.

Under the terms of the Long Beach Judgment, the water supply of the San Gabriel River system was divided at Whittier Narrow. The area downstream of the narrows (e.g., Long Beach, Compton, Torrance) was defined as the “Lower Area” and the area upstream (including the SGVMWD area) defined as the “Upper Area.” Per the Long Beach Judgment, the Lower Area is to receive, annual a specified amount of water made up of surface flow, subsurface flow and imported water provided from the Upper Area. This annual entitlement is guaranteed by the “Upper Area” entities (including SGVMWD) and when river flow and subsurface flows are insufficient to meet the guaranteed entitlement SGVMWD must provide “make-up” water.

Under the terms of the Main Basin Judgment all rights to the diversion of surface water and production of groundwater within the Main Basin and its Relevant Watershed were adjudicated. The Main Basin Judgment does not restrict the quantity of water which Parties may extract from the Basin. Rather, it provides a means for replacing all annual extractions in excess of a Party's annual right to extract water with Supplemental Water. The Main Basin Watermaster annually establishes an Operating Safe Yield for the Main Basin, which is then used to allocate to each Party its portion of the Operating Safe Yield which can be produced free of a Replacement Water Assessment. If a producer extracts water in excess of its right under the annual Operating Safe Yield, it must pay an assessment for Replacement Water sufficient to purchase 1 AF of Supplemental Water to be spread in the Main Basin for each AF of excess production.

SGVMWD is one of the Responsible Agencies from which the Main Basin Watermaster purchases supplemental water. The supplemental water purchased from SGVMWD is for groundwater replenishment purposes (Replacement Water for excess production by a Producer) or Make-up Water for delivery to the Lower Area under the terms of the Long Beach Judgment.

1.2.4 Water Delivery System

SGVMWD provides untreated SWP water to recharge the Main San Gabriel Basin on behalf of its member agencies. Water is delivered via the SWP East Branch through the 38-mile Devil-Canyon-Azusa Pipeline, which has five separate turnouts ranging in capacities from 6 to 55 cubic feet per second. The Pipeline was constructed in 1969 and began delivery of SWP water in mid-1974.

Alhambra’s water delivery system includes 18,558 metered connections, 8 active groundwater wells, six reservoir sites, five booster pump stations, one MWD supply point administered with the Upper SGVMWD, and an interconnection with San Gabriel County Water District.

Monterey Park’s water delivery system includes 15,230 metered connections, 5 treatment facilities, 11 pumping stations, 7 groundwater wells, 14 storage reservoirs, 134 miles of water main, 1,000 fire hydrants, and 15,230 water meters.

Sierra Madre's water delivery system includes 3,969 metered connections, 46 miles of water mains to deliver groundwater to its 3,969 metered connections and four groundwater wells. The City also owns two tunnels located one on either side of the Sierra Madre Dam, owned and maintained by Los Angeles County Department of Public Works. The tunnels act as horizontal wells and produce water by gravity flow. Currently, water is only taken directly into the City's distribution system from the West Tunnel, which has a maximum capacity of approximately 500 gallons per minute.

1.2.5 Energy Efficiency Elements

Implementation of the proposed project will result in energy savings through a reduction in vehicle miles driven for meter reading and energy savings associated with water savings (reduction of pumping from the SWP), as described in further detail in Section 1.4.3.

1.2.6 Past Working Relationship with Reclamation

SGVMWD and the participating member agencies have not had a past working relationship with Reclamation. The City of Azusa, one of the District's retail agencies, was awarded a Fiscal Year 2017 WaterSMART Water and Energy Efficiency Grant in 2017, for the amount of $1 million. The funded project is an AMI project across the Azusa service area.

1.3 Technical Project Description

1.3.1 Project Need and Background

Increasingly frequent and intense dry-weather conditions and uncertain reliability of imported water supplies, compounded with growing populations make improving local supply reliability and increasing water use efficiency more and more crucial. Water agencies across California are seeking means to improve efficiency so as to extend existing supplies. In addition, statewide water use reduction targets are making water use efficiency even more imperative. As a wholesale supplier, SGVMWD supports and encourages its member agencies to implement demand management measures to the extent possible.

As described under Section 1.2, all SGVMWD's member agency connections are metered. The majority are metered with analog meters that require direct readings at the meter. Numerous inefficiencies are common with these types of meters, including an inability to automatically detect leaks, erroneous meter readings, and the use of substantial resources to conduct on-site meter readings and data analysis. Unless customers personally monitor their water use and record their meter readings, leaks may go undetected until the next meter reading or until a customer receives an unusually high water bill. Many low flow leaks may still go undetected under normal circumstances as they will not be apparent from water billing data. Further, it is difficult

for customers to gauge whether or not their water conservation efforts have been effective until meter reading data has been collected and they receive their bill. The proposed project addresses these metering issues and is part of SGVMWD's and its member agency efforts to increase water use efficiency and improve water management in its service area. In addition to the project, the member agencies have been testing the accuracy of their meters over the past year to ensure they are providing accurate data. The project will consist of upgrading a total of 2,975 existing meters with a combination of AMR/AMI technology across three member agencies.

1.3.2 Project Description, Activities and Implementation Schedule

SGVMWD proposes implementing and expanding AMR/AMI within the service areas of three of its member agencies: Alhambra, Sierra Madre and Monterey Park. The AMR/AMI systems will enable water use data to be wirelessly transmitted, and remotely collected. Upgrading the meter system with AMR/AMI will provide numerous water management benefits. Water savings will result by (a) improved accuracy of water metering, (b) facilitated leak detection and more transparency of water meter data, as well as (c) enhanced customer awareness.

Smart meters have exceptional accuracy at low to high flow conditions and transmit water usage data automatically, thereby enabling agencies to more easily detect leaks, improve customer billing accuracy, and avoid erroneous manual readings. In addition, the automation will reduce use of resources, including staff time and fuel for vehicles related to manual meter readings. User-friendly data portals will provide customers and agencies the ability to view water use in real time, identify low and high flow leaks, and track individual water use.

A total of 2,975 meters will be retrofitted with the AMR and/or AMI technology.

AMR/AMI systems generally consist of the following major components, which will also be components of the systems implemented with the proposed project:

1. Smart meters/smart endpoints: smart endpoints are installed on existing meters to collect and store water interval data, event alarms, and other usage data. The endpoint interfaces with, collects, stores, and transmits data from other devices. Two-way communication from the utility to the endpoint enables true on-demand consumption data.

2. Data collection network: A data collection network enables the communication of data sets between the endpoint and the utility at specified intervals or on demand.

3. Application software: This software manages the flow of communication and data being transmitted over the network. It retrieves data stored in each endpoint, consistently reports interval and consumption data, and stores it in a long-term database.

4. Meter data management software (MDMS): This software provides a repository for meter data and allows analysis of the collected data for usage profiling, leak detection, and other advanced functions. Customer Information Systems (CIS) can process data from MDMS to connection with customer billing systems.

Qualified agency staff or a qualified contractor selected by each agency will conduct meter replacements and/or upgrades with appropriate equipment, as well as procure and set up the related software for each participating member agency.

The maximum grant amount for Funding Group I, $300,000 per agreement, is being requested with this application. The grant amount would be split between San Gabriel District's three participating member agencies as shown in the budget information below.

Participating SGVMWD member agencies have already taken steps to investigate AMI options for their individual service areas and some have already begun implementing AMR/AMI programs. The status of each agency and details of proposed implementation activities are described in the following.

City of Alhambra

The City of Alhambra has started a meter replacement program to update conventional, manually read meters to AMR meters. Currently, the City is replacing meters according to meter reading routes and meter age, giving higher priority to older meters. Grant funds made available through the WaterSMART program would provide valuable financial assistance to implement the City's meter upgrade program and allow for domestic and business use meters to be upgraded more quickly. The City plans to upgrade a total of 668 meters as part of this project.

The City will continue to work with its current vendor, National Meter and Automation, using Badger meters. The City has had a number of meetings with this vendor to ensure this is the right product and to work within the City's budget.

City of Monterey Park

As noted above, the City of Monterey Park has already begun implementing a meter replacement program and has changed out all meters 2 inches and smaller with AMR meters. This amounts to approximately 13,000 meters that have been installed to date. With funding provided under this WaterSMART program, the City will fund two aspects of its ongoing AMR/AMI meter program. First, the City will replace a portion of its 3 inches and larger meters with single jet meters with AMI/AMR standards. Approximately 6 large meters will be replaced in the process. The specific type of register (AMR or AMI) would be determined by the customer class and application for which it serves. Remaining funds will be used to upgrade newly installed AMR registered meters to a retrofit AMI register. These upgrades will be done on specific meters that the City keeps on a close watch list due to the drought, such as irrigation

meters and excessive users. The funding will also allow for the City to retrofit the larger meters more quickly.

The City will continue to work with its existing meter vendor, Metron Farnier, and buy directly from the manufacturer.

City of Sierra Madre

This grant would allow the City of Sierra Madre to implement an AMI program to reach 2,028 water accounts, including residential, commercial, industrial and institutional meters. The City of Sierra Madre has evaluated several AMI solutions including those from Sensus, Neptune and Transparent Technologies of Metron Farnier, and has chosen to proceed with Metron Farnier. Selected meters will be equipped with electronic registers and endpoints that will transmit data via the Verizon Wireless cellular network. Grant funds received through this WaterSMART program will be used to cover meter purchase costs for 1,780 residential and 248 commercial meters. The City plans to continue to expand the AMI program to include every metered account in its service area as funding allow.

Proposed Activities

Task 1. Project Management, Administration and Reporting

Project management will be provided by appropriate agency staff to ensure successful project implementation. Activities will include project administrative oversight, working with vendors to manage meter purchases, managing consultants, and conducting meetings as necessary to discuss project progress. The cities will also outreach to customers with schedules for meter replacements and educate them about the important system upgrades and provide user-friendly materials/information about the use and benefits of the new technology.

In addition, grant administration will be performed to execute the grant agreement, ensure compliance with grant requirements, prepare and submit necessary supporting grant documents and provide coordination with the grantee, project partners and the Reclamation grant manager. Assistance will be prepared and submitted regularly in accordance to the grant agreement.

Task 2. Environmental Documentation/Permitting

SGVMWD has determined that activities of the AMI/AMR project do not constitute a “project” under the California Environmental Quality Act (CEQA). Based on review of Reclamation’s NEPA Handbook (February 2012), this project will qualify for a categorical exclusion under the National Environmental Policy Act (NEPA). SGVMWD also evaluated potential permits needed for the project and determined that replacing water meters with a similar piece of equipment did not require permits.

Task 3. Vendor Procurement

This task includes the activities necessary to select a qualified vendor and secure a contract for the AMI/AMR system. Some of the cities have already identified vendors that they would like to contract with; however additional tasks such as contracting and formal bid reviews may still occur. The member agencies will only approve the use of equipment, technologies, and capabilities that are currently commercially available, have been implemented in other agencies, and have a proven history of success. Member agencies will follow their procurement policy protocols to select a qualified vendor and to purchase equipment for their AMI/AMR system needs.

Task 4. AMI/AMR Equipment and Software Installation

This task includes the purchase and installation of AMI/AMR equipment and software, including transmitters and meter retrofits, network set up and data management system software. Activities implemented under this task may include the following:

- Purchase of AMR/AMI equipment
- Remove and replace existing meters with AMR
- Upgrade existing AMR meters with AMI technology
- Installation of communication systems to support the AMR/AMI systems
- Final testing and implementation
- Staff training
- Community outreach
- Data management

Implementation Schedule

Below is the project implementation schedule by task. The project will be completed by September 1, 2020, or within 2 years of project award, however full implementation is anticipated to occur sooner.

TABLE 2. PROJECT SCHEDULE

	Task	Start Date	End Date
1	Project Management, Administration and Reporting	September 1, 2018	September 1, 2020
2	Environmental Documentation/Permitting	Not Applicable	
3	Vendor Procurement	April 1, 2018	September 1, 2018
4	AMI/AMR Equipment and Software Installation	September 1, 2018	September 1, 2020

1.4 Evaluation Criteria

Descriptive narratives addressing how the proposed project meets grant criteria are provided in the following subsections. The evaluation criteria, as described in the Funding Opportunity Announcement, are presented first in *italics*, followed by specific information on the proposed project.

1.4.1 Evaluation Criterion A: Quantifiable Water Savings

Describe the amount of estimated water savings. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

The proposed project is expected to conserve 166 AFY of water. Please see below for calculations.

Describe current losses: *Please explain where the water that will be conserved is currently going.*

The participating agencies are currently experiencing losses of between 6% to 20% of total water supply, as described in detail in the following section. A large portion of these estimated water losses are considered to be a result of undetected leaks, which could be identified and repaired in a timelier manner with implementation of the proposed project. The leaking water would be lost to the system in part upon seeping into the ground, evaporating, and/or flowing into drainage systems. It is important to note that the source of the water that SGVMWD imports and then eventually recharges into the groundwater basin for use by the member agencies is SWP water from the Delta where instream flows are vital to the ecosystem. Any water that is in essence saved from water conservation efforts through leak detection would result in less water needed to be brought in from the Delta. Water also left in the groundwater basin itself would remain to enhance the reliability and sustainability of the groundwater resource, thus water savings would also be a direct benefit to the groundwater basin.

Another portion of water that would be saved through this project is being used inefficiently in household and landscaping settings. Therefore, water that will be conserved with implementation of the project would remain in the distribution system and would be available for additional beneficial uses.

Estimated amounts of water savings and details on estimated losses are described in the following.

Describe the support/documentation of estimated water savings: *Provide sufficient detail supporting how the estimate was determined, including all supporting calculations.*

Please see response to ***Municipal Metering***, Question *(a)* below.

Municipal Metering: *To receive credit for water savings for a municipal metering project, an applicant must provide a detailed description of the method used to estimate savings, including references to documented savings from similar previously implemented projects. Applicants proposing municipal metering projects should address the following:*

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

The participating agencies are currently experiencing losses of between 6% to 20% of total water supply. Water audits were conducted by each SGVMWD agency using the American Water Works Association (AWWA) water audit software, as part of the preparation of 2015 Urban Water Management Plans, or more recently. These audits provided information on system water losses, which is the difference between the volume of water supplied and the volume of authorized consumption (billed and unbilled). The table below shows the average distribution losses determined for each agency participating in the proposed project.

TABLE 3. DISTRIBUTION WATER LOSSES BY AGENCY

Agency	Distribution Water Loss (% of water supply)	Distribution Water Loss (AFY)
City of Alhambra[1]	6%	613
City of Monterey Park[2]	6%	140
City of Sierra Madre[3]	20%	405

Notes:
[1]Average water loss between 2011 and 2015; City of Alhambra 2015 Urban Water Management Plan
[2]Average water loss in 2016; City of Monterey Park AWWA Validated Water Audit
[3]Average water loss in 2016; City of Sierra Madre AWWA Validated Water Audit. In 2016 the City experienced over 400 leaks with very old meter inventory.

A large portion of these estimated water losses are considered to be a result of undetected leaks and meter inaccuracies. The proposed AMI/AMR system can provide notification to both agency staff and customers of major and minor leaks and atypical patters of use with high accuracy, thereby helping to reduce water losses. In addition, general water use efficiency can also be improved through heightened customer awareness with user-friendly web portals and billing statements, allowing customers to more easily track their use as well and view a comparison to other customers.

As noted previously, the City of Monterey Park, which is a participating agency in the proposed project, has been performing substantial work within its service area to upgrade its water meters. To date, the City has replaced all meters 2 inches and smaller with AMR meters. With those upgrades, the City observed that distribution water losses

documented for the City decreased from 15 percent prior to implementation down to 5 percent upon completion (City of Monterey Park 2016). That signifies a 67 percent ([15-10]/15 = .67 x 100 = 67%]) decrease in water losses, resulting from those meter upgrades.

Similar reductions in water losses have been documented in other studies. For example, the City of Santa Maria, which was profiled in WaterWorld Magazine in 2011, experienced reductions in water losses from 6% to 2% one year after implementing an AMI program (Godwin 2011). These reductions also translate into a 67 percent ([6-2]/6 = .67 x 100 = 67%]) reduction in water losses. A higher end estimate of loss reductions was gathered from a 2013 EPA report, which stated that up to 75 percent of average water system losses are recoverable.

For purposes of estimating water savings with implementation of this project, it was conservatively assumed that water losses for each SGVMWD member agency could be reduced by 67 percent, which is in-line with reductions experienced in the City of Monterey Park service area. Depending on the level of inefficiencies existing within the service areas and based on other success stories of AMI implementation, it is likely that total water savings may be greater.

Water savings resulting from implementation of the proposed project were calculated therefore, assuming 67 percent reduction in water losses, taking into account the average water losses shown above, and also taking into account the number of meters to be replaced compared to the total number of metered connections, as shown in the table below.

TABLE 4. ESTIMATED WATER SAVINGS BY AGENCY

Agency	Distribution Water Loss (AFY) (a)	67% Reduction of Distribution Water Loss (AFY) (b) [(a) x 67%]	Proportion of New Upgrades to Existing Meters (c)	Projected Water Savings (AFY) (b)*(c)
City of Alhambra	613	411	668/18,588=0.04	15
City of Sierra Madre	405	271	2,028/3,969=0.58	139
City of Monterey Park	See explanation below for City of Monterey Park water savings calculations			12
Total (Alhambra, Monterey Park, and Sierra Madre)				**166**

Since the City of Monterey Park has already reduced water losses from previous meter replacements, water savings for the City of Monterey Park are calculated based on water use for 6 large meters that have not yet been upgraded[1]. Total water use for those accounts is 122 AFY, based on City records. For the water savings estimates, it was assumed that pre-project water losses of the 6 large meters are 15% which was experienced system-wide in Monterey Park. Further, it was assumed that these water losses could be reduced by 67%, as discussed above. Accordingly, the water savings from the City of Monterey Park are estimated at 12 AFY (122 AFY x 0.15 x 0.67).

As shown in Table 3, in total, project implementation is expected to result in 166 AFY of water savings across the participating SGVMWD member agencies.

(b) How have current distribution system losses and/or the potential for reductions in water use by individual users been determined?

As required by the California Urban Water Management Act, and as described above, each participating agency completed an Urban Water Management Plan (UWMP) in July 2016 which included evaluation of water loss using AWWA methodology. A large portion of those losses can be attributed to undetected leaks and meter reading inaccuracies. The AMI/AMR meters will reduce these water losses, as described above, primarily by facilitating early leak detection and by providing highly accurate meter reading.

(c) For installing individual water user meters, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use.

See discussion in (a) above. Water savings are assumed to be similar to savings observed in the City of Monterey Park, where meter upgrades implemented to date have shown water loss reductions of 67%. The City of Monterey Park is a member agency of SGVMWD and a participating agency in this application. As a result, those savings are considered to be highly applicable to the potential water savings estimated for the proposed project. Further, that level of savings is in-line with other available studies on water savings form AMR/AMI implementation, including in the City

(d) If installing distribution main meters will result in conserved water, please provide support for this determination (including, but not limited to leakage studies, previous leakage reduction projects, etc.). Please provide details underlying any assumptions being made in support of

[1] The savings calculated for the City of Monterey Park are conservative in that they only address the 6 large meters being retrofitted. Additional savings are anticipated from the conversion of approximately 50 meters from AMR to AMI technology (as mentioned in Section 1.3.2). However, estimates of these savings were unknown and therefore omitted from the analysis.

water savings estimates (e.g., how leakage will be reduced once identified with improved meter data).

This Project does not include installation of distribution main meters.

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

The proposed project will include installation of AMR/AMI meters from vendors selected by each individual agency. The agencies are working with a variety of meter and AMR/AMI manufacturers. Meters will be selected to meet each agency's performance standards and system requirements. Preliminary information on devices to be installed by agency is provided below:

The Orion AMR System is what is used in Alhambra to read the water meters on a bi-monthly basis. The City of Alhambra is working with National Meter and Automation to install AMI meters from Badger Meter, Inc, ranging in size from ¾" to 4", which will use Orion® Cellular endpoint technology. The City expects to install 668 AMR meters.

The City of Monterey Park is working with Metron Farnier to install single jet meters with AMI/AMR standards. The specific type of register will be determined by customer class and application. The City of Monterey Park expects to install 6 large AMR meters and retrofit 50 AMI meters.

The City of Sierra Madre has selected Sensus, a Xylem Company as the vendor. The devices to be installed are the Innov8 VN Register with the Verizon Solution, to be installed on Sensus SRII. The City of Sierra Madre expects to install 2,028 AMR meters.

(f) How will actual water savings be verified upon completion of the project?

Water savings will be verified by comparing water meter consumption data from each newly installed AMI/AMR meter, with historical water meter data for the same customers. Historic water use data will be normalized by taking into account historical water use trends and temporary water conservation measures implemented during the assessment timeframe.

1.4.2 Evaluation Criterion B: Water Supply Reliability

Please address how the project will increase water supply reliability. Proposals that will address more significant water supply shortfalls benefitting multiple sectors and multiple water users, will be prioritized. General water supply reliability benefits (e.g., proposals that will increase resiliency to drought) will also be considered. Please provide sufficient explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

- *Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?*

The project highly promotes collaboration as a method for increasing regional water supply reliability. The Project is a regional collaboration among SGVMWD and three of its member agencies to enhance water conservation and improve overall water management in the region. SGVMWD and its member agencies recognize that optimizing water use efficiency is critical for increasing water supply reliability, in order to reliably meet projected water demands, reduce dependence on energy-intensive and increasingly unreliable imported water supplies, and improving reliability of local water supplies. As the wholesale agency, SGVMWD has taken the lead to coordinate this funding proposal in order to advance the implementation of AMR/AMI within its service area.

In addition, implementation of the project also requires collaboration and cooperation with customers and results in increased customer awareness of water usage, which will help increase water use efficiency and in turn water supply reliability.

- *Is there widespread support for the project?*

Yes, there is widespread support for the proposed project. Each member agency is fully supportive of project and will contribute matching funds to implement their portion. Support letters are provided in Appendix B.

In addition, it is anticipated that the project will be highly supported by agency customers, as water savings, improved leak detection and reduced metering inaccuracies can all result in lower water bills.

- *What is the significance of the collaboration/support?*

Each participating member agency will be implementing a portion of the proposed project in their respective service area. SGVMWD has taken the lead to promote this project and coordinate this funding proposal, and each agency will lead implementation within their service areas and contribute necessary project funds.

Further, the collaboration with agency customers provides a valuable opportunity for outreach and heightened awareness on the need for improved water use efficiency.

- *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes. The project's AMI/AMR capabilities will allow the cities to alert customers to their own water use on a much more frequent basis. This sort of feedback can be very powerful. A study conducted by IBM and the City of Dubuque, IA, using an AMI system from Neptune, looked at how access to daily consumption data affected water usage habits. It found that the group that had access to daily usage data was much more likely to change their consumption habits than the control group that did not.

- *Will the project make water available to address a specific water reliability concern?*

    - *Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries.*

The SGVMWD service area is dependent on limited water resources, but is facing steady population growth, compounded by climate variability which are impacting reliability of water supplies. SGVMWD and its retail agencies recognize that it is imperative that water resource management focus on optimizing water use efficiency.

SGVMWD's sole source of water supply is SWP water, which it recharges to the Main San Gabriel Basin on behalf of its member agencies. The availability of SGVMWD's SWP supplies is highly dependent on hydrologic conditions, among other factors and SWP supplies vary from year to year. Based on the SWP Delivery Capability Report, the availability of supplies to SGVMWD is projected to range from 11 to 62 percent of its total Table A Amount allocation.

The Main San Gabriel Basin continues to experience near historic low levels due to recent drought conditions. Therefore, any water that is saved through the detection of leaks, allowing such water to remain in the groundwater basin, ultimately benefits the basin.

In wet or normal years, SGVMWD projects meeting member agency demands through 2040, and its member agencies also project being able to meet demands with existing supplies. In drought years however, the reduced SWP allocation, and fluctuations in groundwater levels, could require member agencies to find other local supplies and curtail demand.

Water use efficiency is crucial for sustainably using existing supplies and ensuring that SGVMWD and its member agencies will be able to continue reliably meeting demands.

    - *Describe where the conserved water will go/how it will be used. Will the project directly address a heightened competition for finite water supplies and over-allocation? Will it be left in the river system?*

The water conserved by implementation of this project is water that would have been lost via leaks, unaccounted for, and otherwise used inefficiently. Therefore, water conserved with the project will remain in the distribution system and will be available for meeting other water demands within agency service areas. As the water supplies primarily come from local groundwater, which is replenished with imported SWP water, we assume that the water saved would reduce the need for imported replenishment water in equal amounts. High demands for SWP water combined with changing environmental conditions and increased environmental demands are increasing stresses on the Delta. By reducing demands on SWP supplies, the conserved water

would essentially remain at its source, in the Sacramento-San Joaquin Delta (Delta), thereby making more water available for other beneficial uses.

Water conserved will also result in greater basin groundwater retention and recharge; this project is vital at this time due to historically low elevations of groundwater.

- *Describe how the project will address the water reliability concern?*

As described above, the SGVMWD service area is dependent on limited water resources, but is at the same time facing steady population growth and therefore increased demands. These conditions are compounded by changing climate conditions that are also impacting reliability of water supplies. SGVMWD and its agencies realize that water use efficiency is crucial for reliably meeting demands into the future while sustainably using available supplies.

This project signifies an important step toward long-term water use efficiency, thereby helping to extend existing supplies and improving overall water reliability.

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

Competing demands for SWP supplies creates tensions related to the Delta system from which SGVMWD receives its water supplies. Implementation of this Project will help reduce overall demands, including the amount of water needed to be imported via the SWP.

Further, the SGVMWD service area is dependent on limited water resources, but is facing steady population growth, compounded by climate change impacts that are also impacting reliability of water supplies. It is imperative that water resource management focus on optimizing water use efficiency. This project will improve local water supply reliability thereby helping to prevent local water-related crisis or conflict.

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

Water conserved will result in greater basin groundwater retention and recharge; this project is vital at this time due to historically low elevations of groundwater. Some water conserved by implementation of this project will remain in the distribution system and will be available for meeting other existing water demands within agency service areas. The saved water can be immediately put to beneficial use.

- *Describe the roles of any partners in the process. Please attach any relevant supporting documents.*

The Project is a regional collaboration among SGVMWD and three of its member agencies to enhance water conservation and improve overall water management in the

region. SGVMWD has taken the lead to coordinate this funding proposal in order to advance the implementation of AMR/AMI across agency service areas. Each participating agency is fully supportive of the project and will lead implementation within their service areas as well as contribute necessary project funds. Support letters are provided in Appendix B.

- *Indicate the quantity of conserved water that will be used for the intended purpose.*

The project will save a total of 166 AFY. The water saved can be immediately available for meeting other existing water demands within agency service areas.

- *Will the project benefit Indian tribes?*

The project will equally benefit all potable water customers within the agency service areas. While there are no direct benefits to Indian tribes as they are not specifically served by the agencies, the project may help Reclamation meet trust responsibilities to Indian tribes to the extent that by reducing demands on SWP imports the project will help improve conditions on water resources that could benefit Reclamation projects.

- *Will the project benefit rural or economically disadvantaged communities?*

The proposed project will increase potable water availability in the SGVMWD service area by improving water use efficiency and facilitating water conservation. The additional water made available will equally benefit all potable water customers within the agency service area, which include economically disadvantaged communities within those boundaries. The proposed project has the potential to benefit economically disadvantaged customers most, as the project may result in lower water bills through facilitated leak detection and increased water use efficiency.

- *Will the project benefit species?*

The water conserved with this project will remain in the distribution system, which will reduce the need for imported replenishment water in equal amounts. By reducing demands on SWP supplies, the conserved water would essentially remain at its source, the Delta which would help maintain instream flows and ecosystem health. The Delta is the largest wetland ecosystem on the Pacific Coast of the United States and provides habitat to highly diverse plant and animal life. Therefore, by reducing demands on the Delta, the project could also benefit species dependent on the Delta.

- *Will the project address water supply reliability in other ways not described above?*

The proposed project will result in long-term water use efficiency improvements within the agency service areas. In addition to improved meter accuracy and facilitated leak detection, the heightened visibility of water usage with user-friendly portals will also promote increased water use efficiency from customers. These demand-side measures

are a critical component of water supply reliability that will be addressed with the proposed project. In addition, implementation of the proposed project enabled through the federal funding leverage will facilitate additional implementation needed to cover remaining areas within the agency boundaries. As a result, implementation of the proposed project is likely to contribute to additional savings in the future. Lastly, water conserved will alleviate the severity of cyclic drought conditions over time and result in greater basin groundwater retention and recharge; this project is vital at this time due to historically low elevations of groundwater.

1.4.3 Evaluation Criterion C: Implementing Hydropower

The proposed project does not include construction or installation of renewable energy components but will have water savings benefits as a result of reducing water use and by reducing vehicles miles driven associated with conducting manual meter reading.

1.4.4 Evaluation Criterion D: Complimenting On-Farm Irrigation Improvements

This criterion is not applicable to this project.

1.4.5 Evaluation Criterion E: Department of the Interior Priorities

- *Address those priorities that are applicable to your project.*
    - *Creating a conservation stewardship legacy second only to Teddy Roosevelt*
- *Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;*
- *Examine land use planning processes and land use designations that govern public use and access;*
- *Revise and streamline the environmental and regulatory review process while maintaining environmental standards.*
- *Review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;*
- *Foster relationships with conservation organizations advocating for balanced stewardship and use of public lands;*
- *Identify and implement initiatives to expand access to DOI lands for hunting and fishing;*
- *Shift the balance towards providing greater public access to public lands over restrictions to access.*

The proposed project is the result of long-term, rigorous water resources planning using best available science to identify best practices for managing water resources. SGVMWD and its member agencies have worked for decades to manage water resources effectively and sustainably to reliably meet the growing demands of their service areas. The agencies continuously undertake methodological planning efforts, including assessments of available and potential future supplies, and demand

forecasting. Those planning efforts are highly dependent on best available science, which is developed on a local, regional and statewide level to identify best practices for managing water resources and adapting to changes in the environment.

Among the planning efforts of these agencies is the preparation of Urban Water Management Plans. As required by the Urban Water Management Planning Act, California Water Code (CWC) Division 6, Part 2.6, urban water suppliers are required to prepare and adopt Urban Water Management Plans at least once every five years in recognition that, among other factors, water resources are a limited resource subject to ever increasing demands, and conservation and efficient use of water is a high priority whose planning can be best accomplished at the local level. The UWMP outlines demand management measures common to the industry and those used or planned for implementation in the agency service areas. Metering programs are among the recognized demand management measures to achieve effective water conservation.

Due to the source of water to SGVMWD, the DWR SWP Delivery Capability Report is one of many highly important resources based on science utilized for SGVMWD's water resources planning efforts. The Report, prepared by DWR every 2 years, identifies estimated availability of SWP supplies under a range of hydrologic conditions based on robust modeling. Estimates also take into account all regulations governing SWP and CVP operations. These estimates are the basis of SGVMWD supply projections.

SGVMWD and its member agencies will continue to rely highly on science combined with the experience and knowledge of expert water resource managers to identify best practices for effectively managing water resources adapting to changes in the environment.

- *Utilizing our natural resources*

- *Ensure American Energy is available to meet our security and economic needs;*
- *Ensure access to mineral resources, especially the critical and rare earth minerals needed for scientific, technological, or military applications;*
- *Refocus timber programs to embrace the entire 'healthy forests' lifecycle;*
- *Manage competition for grazing resources.*

Demands within SGVMWD's and its member agencies service areas are forecasted to increase by approximately 30 percent by 2040. While ongoing drought conditions and associated water conservation efforts have resulted in demand decreases in recent years, demand is anticipated to display a rebound effect when the drought subsides and as the population increases. Efficient management of this local resource is paramount to meeting future demands and providing a reliable supply. Water conserved will alleviate the severity of cyclic drought conditions over time and result in greater basin groundwater retention and recharge; this project is vital at this time due to historically low elevations of groundwater.

- *Restoring trust with local communities*

- *Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;*
- *Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.*

SGVMWD receives imported water from the SWP and distributes it for the broader needs of its member agencies. As the wholesale agency, the District cannot enforce water use restrictions at the local level. However, the District encourages water conservation within its service area and works regularly with the member agencies to support their own conservation efforts and assist in infrastructure maintenance and repair where possible and appropriate. In this way the demands on SWP are also reduced.

- *Striking a regulatory balance*

- *Reduce the administrative and regulatory burden imposed on U.S. industry and the public;*
- *Ensure that Endangered Species Act decisions are based on strong science and thorough analysis*

This DOI priority is not applicable to the project.

- *Modernizing our infrastructure*

- *Support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;*
- *Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;*
- *Prioritize DOl infrastructure needs to highlight:*
  - *Construction of infrastructure;*
  - *Cyclical maintenance;*
  - *Deferred maintenance*

SGVMWD and the member agencies service area dates to the mid-1920s. The water meters targeted for replacement or retrofit are typically less than 15 years old. Cities recognize that modernizing their existing system with AMI/AMR smart meters benefits the whole region through advanced leak detection, ultimately resulting in better management of the infrastructure. Each member agency has chosen a vendor, all private companies, that provides solutions for energy and water management and for accelerating innovations.

1.4.6 Evaluation Criterion F: Implementation and Results

1.4.6.1 Subcriterion F.1 – Project Planning

- *Does the applicant have a Water Conservation Plan and/or System Optimization Review in place?*
    - *Identify any district-wide, or system-wide, planning that provides support for the proposed project.*

SGVMWD, along with each member agency submitted 2015 UWMPs to DWR, in compliance with the Urban Water Management Planning Act in California Water Code. Each agency updates its UWMP every five years. The 2015 UWMP guidelines require a specific set of demand management measures (DMMs) to be reported on in the 2015 UWMPs, including Water Waste Prevention Ordinances, Metering, Conservation Pricing, Public Education and Outreach, Programs to Assess and Manage Distribution System Real Loss, and Water Conservation Program Coordination and Staffing Support.

The UWMP section on DMMs of each of the agencies describes how each DMM is being implemented. Further, the UWMPs lay out agency goals for reducing or maintaining per capita water use to comply with water use targets required by the California Water Conservation Act of 2009, SBx7-7. This project is among the measures needed for optimizing water use efficiency.

Although SGVMWD, as a wholesale agency, has no legal authority to require its member agencies to implement the DMMs, SGVMWD supports and encourages its member agencies in implementing the DMMs.

Links to each agency's 2015 UWMP are provided below:

- SGVMWD: http://sgvmwd.org/Portals/0/FlexEvents/664/BoardMeeting/SGVMWD_2015%20Final%20UWMP%20(wAppendix)_2016-06-29.pdf

- City of Alhambra: https://wuedata.water.ca.gov/public/uwmp_attachments/9916196525/ALHAMBRA%202015%20FINAL%20UWMP%20%28wAppendix%29_2016-06-29.pdf

- City of Monterey Park: https://wuedata.water.ca.gov/public/uwmp_attachments/5038678824/Volume%20I%20-%202015%20UWMP%20City%20of%20Monterey%20Park.pdf

- City of Sierra Madre: https://wuedata.water.ca.gov/public/uwmp_attachments/4559125602/Sierra%20Madre%202015%20FINAL%20UWMP%20%28wAppendix%29_2016-06-28.pdf

In addition, to the UWMPs, SGVMWD completed an Integrated Resources Plan (IRP) in 2015, which emphasizes the importance of water conservation for managing water use. (The IRP is included as Appendix O in the SGVMWD 2015 UWMP.)

Lastly, the Water Plan is the State of California's strategic plan for managing and developing water resources statewide for current and future generations. It provides a collaborative planning framework for elected officials, agencies, tribes, water and resource managers, businesses, academia, stakeholders, and the public to develop findings and recommendations and make informed decisions for California's water future. The plan is updated every five years.

The 2013 State of California Water Plan outlines smart metering as a top Best Management Practice (BMP), see Section 3: Urban Water Use Efficiency. Due to the large size of the Plan is not included in this application, but can be found here: http://www.waterplan.water.ca.gov/docs/cwpu2013/2013prd/Vol3_Ch03_UrbanWUE_PubRev iewDraft_Final_PDFed_co.pdf.

- *Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan.*

SGVMWD and the member agencies are stakeholders in the subregional Upper San Gabriel River and Rio Hondo Subregional Plan; one of five subregional plans that comprise the Greater Los Angeles County (GLAC) Integrated Regional Water Management Plan (IRWMP). The GLAC IRWMP subregional plan describes the region's physical setting, sources of water supply, water quality, environmental resources, planning objectives and targets, and partnership and multi-benefit opportunities. The Project will help attain objectives of GLAC IRWMP, including to Improve Water Supply and Address Climate Change. The IRWMP Objective to Improve Water Supply focuses on optimizing local water resources to reduce the Region's reliance on imported water. The targets include conserving water through water use efficiency and conservation measures. The Project will increase water use efficiency and reduce loss of potable supplies. This reduction in potable water demands will also contribute to lower demands on imported supplies for groundwater replenishment.

The objective to Address Climate Change focuses on adapting to and mitigating against climate change vulnerability with targets of increasing local supplies, implementing "no regret" adaptation strategies, and implementing mitigation strategies that decrease emissions of greenhouse gases. The proposed Project will help improve local supply reliability by reducing demands and will result in reductions in energy use and greenhouse gas emissions.

As the project will reduce water demand and consumption within each City's service area, it also contributes to the DMMs identified within each UWMP.

Lastly, the reduced water consumption that results from the proposed project aligns with the State's objective for reducing per capita water consumption by 20 percent by the year 2020. The Plan indicates that AMI systems are Best Management Practices that assist in providing water conservation. The Plan cites the Pacific Institute and Single Family Water Use Study to show the significance of water loss due to residential leaks (averaging 7 to 10 gallons per capita per day [GPCD]). This study showed that if residential leaks could be identified and repaired earlier, the savings would be 6-7.5 GPCD.

1.4.6.2 Subcriterion F.2 – Performance Measures

- *Provide a brief summary describing the performance measures that will be used to quantify actual benefits upon completion of the project.*

The primary objective of the proposed project is to increase water use efficiency and improve water management by reducing water waste resulting from leaks, inaccurate meter readings, and inefficient water use. SGVMWD will compile data from its member agencies to report on water savings as a direct result of project implementation. Performance measures will consist of the following:

Overall Water Savings

With the implementation of AMI/AMR, SGVMWD member agencies will be able to monitor real time water use and collect and store data with the AMI/AMR data management system. Total water savings resulting from project implementation will be quantified by comparing water meter consumption data from each newly installed AMI/AMR meter, with historical water meter data for the same customers. Post-implementation water savings will be based on average water use over a one-year period upon implementation. Historic water use data will be appropriately normalized by accounting for water use trends over the past 5-year period and accounting for conservation measures implemented in response to ongoing drought conditions and statewide water use reduction mandates of 2015. Water use savings data will also be compared to control groups of customers that did not receive AMI/AMR meter upgrades to increase robustness of results.

Water Savings from Leak Detection

Agencies will also compile and analyze data related to water savings from early leak detection. One of the important benefits of AMI/AMR systems is that they can provide real time data in combination with high accuracy of high and low flows, thereby facilitating early leak detection. Alarms are triggered by unusual water usage that may indicate leaks. The majority, if not all, of these leaks would be unaccounted-for water losses and are generally difficult to quantify. Agencies will track alarms triggered and related leak fixes. Using the AMI/AMR data, agencies will estimate what portion of unaccounted-for water losses resulted from leaks and will be able to quantify how much

early leak detection savings account for total water savings calculated in pre-/post-water use comparisons.

Water Savings from Consumer-Side Conservation

Another important benefit of AMI in particular, is a user-friendly water use data portal, allowing water customers to more easily view and track water usage. This accessibility of water use data can result in self-leak detection and water use behavioral changes. Agencies will analyze water use reductions to estimate customer-side conservation as a portion of total water savings. The member agencies can track this behavior by comparing a 'before and after' average gallons per capita per day using 2017-2018 data as the baseline and comparing it to average gallons per capita per day using 2020 data post-project implementation.

Quantification of Meter Installations/Upgrades

In addition to water savings measurements, all agencies will produce statistics on meter installations completed, including the following information:

- Number of AMI/AMR meters installed
- Whether meters were upgraded from manual read meters or AMR meters, or replaced altogether
- Account types for which meters were installed

1.4.7 Evaluation Criterion G: Nexus to Reclamation Project

- *Is the proposed project connected to Reclamation project activities?*

The proposed project is connected to Reclamation project activities, because it benefits the same Delta region as the Central Valley Project (CVP), a federal project, managed by Reclamation, and the largest surface water storage/delivery in California. The applicant, SGVMWD, receives all its water from the SWP, which in turn is closely connected to the CVP. The SWP and CVP each draw water from the Delta, where the Sacramento and San Joaquin Rivers meet, and the two projects share responsibility for in-basin use as well as for sharing surplus flows.

By improving local water use efficiency, demands may be reduced on SWP supplies, thereby contributing to improved conditions in the Sacramento-San Joaquin Delta. Improvements to the overall health of the Delta also benefit Reclamation project activities that depend on the Delta.

- *Does the applicant receive Reclamation project water?*

The applicant, SGVMWD, does not receive Reclamation project water. SGVMWD's sole source of water is the SWP. SGVMWD member agencies depend primarily on local water supplies, including groundwater supplies that are replenished with SWP water provided by SGVMWD, however they also receive Colorado River water in some instances. Some supplies are provided by MWD, a portion of which come from the Colorado River, which is a Reclamation Project. The City of Alhambra receives a portion of its supplies from MWD as part of an exchange agreement. In addition, the cities of Monterey Park and Sierra Madre both have emergency connections with the Upper San Gabriel Valley Municipal Water District which receives MWD supplies.

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

No, the Project is neither on Reclamation lands nor does it involve Reclamation facilities.

- *Is the project in the same basin as a Reclamation project or activity?*

No, the Project is not located in the same basin as a Reclamation project or activity.

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

Yes, the Project will help reduce water demands locally which would result in reduced needs for SWP water imported from the Sacramento-San Joaquin Delta. Multiple Reclamation projects are located within the Delta watershed and often closely interlinked with the SWP system, such as the CVP. By reducing the amount of water imported, this water remains in the Delta watershed, thereby also benefitting Reclamation projects.

The project is also associated with Reclamation's Sacramento and San Joaquin Basin's Study. While SGVMWD is not a direct participant in the Basin Study, it is a SWP contractor and benefits directly from the Sacramento and San Joaquin Rivers Basin Study. In 2015, SGVMWD purchased and recharged nearly 6,000 AFY of water imported from the SWP. The Sacramento and San Joaquin rivers both flow into the Sacramento-San Joaquin Delta, which is the source of SWP supplies. In March 2016, the Sacramento and San Joaquin Rivers Basin Study was completed. The Study identifies adaptation portfolios each comprised of a unique set of water management actions to address anticipated climate change impacts on water supplies, demands, infrastructure and endangered species.

Increasing Municipal and Industrial Water Use Efficiency is one of the water management actions identified to address the overarching objective of Reducing Water Demand. In fact, the Basin Study concluded that actions to increase water supplies and

improve water use efficiencies, among other things, were particularly effective in addressing anticipated impacts to water deliveries[2]. The proposed Project will reduce water demands and improve water use efficiency, and thereby directly aligns with the identified Basin Study objective of reducing water demand.

- *Will the project help Reclamation meet trust responsibilities to Tribes?*

The project may help Reclamation meet trust responsibilities to Tribes to the extent that by reducing demands on SWP imports the project will help improve conditions on water resources that could benefit Reclamation projects.

1.4.8 Evaluation Criterion H: Additional Non-Federal Funding

State the percentage of non-Federal funding provided.

$$\frac{\$1{,}063{,}004 \text{ [Non-Federal Funding]}}{\$1{,}363{,}004 \text{ [Total Project Cost]}} = 78\% \text{ cost share}$$

The percentage of non-Federal funding will be 78%. This is greater than the required 50% match.

[2] Reclamation, Sacramento and San Joaquin Basins Study, Report to Congress 2015. Prepared for: U.S. Department of the Interior, Bureau of Reclamation, Mid Pacific Region. Prepared By: CH2M Hill under Contract No. R12PD80946; https://www.usbr.gov/watersmart/bsp/docs/finalreport/sacramento-sj/Sacramento_SanJoaquin_TechnicalReport.pdf

Section 2: Project Budget

2.1 Funding Plan and Letters of Commitment

- *[Describe] How the non-Federal share of project costs will be obtained.*

Monetary contributions will come from agency capital improvement program funds. The source of SGVMWD funds are unrestricted water revenues, power revenue sales, and SWP restricted revenues. A portion of agency cost share will also come from in-kind contributions in the form of agency staff time, as described further below.

- *Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:*

    a. *The project expenditure and amount*

    b. *The date of cost incurrence*

    c. *How the expenditure benefits the Project*

As described previously, the SGVMWD agencies have already completed preliminary planning efforts to evaluate and/or select meter vendors. These costs are not being included as project costs. The project budget shown below encompasses costs that will be incurred upon award of funding.

    d. *The identify and amount of funding to be provided by funding partners*

With this proposal, SGVMWD is requesting the maximum grant amount available for Funding Group I, which is $300,000. The grant amount would be split between San Gabriel District's three member agencies. All remaining costs, $1,048,390, will be provided by the member agencies in the amounts shown in the Table 4 below and specified in their funding commitment letters.

- *Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment*

No funding will be provided by a third party.

- *Describe any funding requested or received from other Federal partners*

No funding has been requested or received from other Federal partners for the project.

- *Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.*

There are no other outstanding funding requests for the project.

Table 5 below summarizes all funding sources (non-Federal and Federal) for the proposed project.

TABLE 5. SUMMARY OF NON-FEDERAL AND FEDERAL FUNDING SOURCES

Funding Sources	Percent of project cost	Funding Amount
Non-Federal Entities		
1. SGVMWD	2%	$29,625
2. City of Alhambra	14%	$184,104
3. City of Monterey Park	5%	$20,563
4. City of Sierra Madre	61%	$828,712
Non Federal Subtotal:	***78%***	***$1,063,004***
Other Federal Entities		**$0**
NA		
Requested Reclamation Funding:	***22%***	***$300,000***
Total Project Funding:		**$1,363,004**

2.2 Budget Proposal

The Project Budget consists of costs associated with the implementation of the proposed project and fall within various budget categories, including equipment, supplies, materials, contractual and/or implementation, among others. The budget proposal is provided in Table 6, which is set up to reflect all budget categories listed in the FOA. The budget items included in the table are detailed by task (Task 1 Project Management, Administration, and Reporting; Task 2 Environmental Compliance/Permitting; Task 3 Vender Procurement, and Task 4 AMI/AMR Equipment and Software Installations) and are described in detail below. It is important to note that each participating agency has chosen to seek reimbursement and provide matching funds under select categories.

TABLE 6. BUDGET PROPOSAL

Budget Item Description	Computation		Quantity Type	Total Cost
	$/Unit	Quantity		
Salaries and Wages				
SGVMWD: Task 1 Grant Admin	$125	60	Hrs	$7,500
Alhambra: Task 1 Grant Admin	$100	50	Hrs	$5,000
Alhambra: Task 1 Project Mgmt	$100	40	Hrs	$4,000
Monterey Park: Task 1 Project Mgmt	$52.37	100	Hrs	$5,237
Monterey Park: Task 1 Grant Admin	$69.16	50	Hrs	$3,458
Monterey Park: Task 4 AMI Installation	$39.67	400	Hrs	$15,868
			Salaries and Wages Subtotal:	*$41,063*
Fringe Benefits				
Not Applicable				
Travel				
Not Applicable				
Equipment				
Not Applicable				
Supplies and Materials				
Alhambra: Task 3 – AMI Equipment	$302	668	Meters	$201,736
Monterey Park: Task 3 – AMI Equipment	$7,000	6	Lrg. Meters	$42,000
Sierra Madre: Task 3 – AMI Equipment	See Budget Detail	2,028	Meters	$899,657
			Supplies and Materials Subtotal:	*$1,143,393*
Contractual/Construction				
SGVMWD: Task 1 Program Mgmt	$295	75	Hrs	$22,125
Alhambra: Task 1 Grant Admin	2.5% of total construction costs			$7,368
Alhambra: Task 4 AMI Installation	Consultant cost estimate			$86,000
Alhambra: Task 4 AMI Software, MDMS	Consultant cost estimate			$7,000
Sierra Madre: Task 1 Project Mgmt	2.5 % of total construction costs			$23,310
Sierra Madre: Task 3 AMI Installation	Consultant cost estimate			$32,745
			Contractual/Construction Subtotal:	*$178,548*
Other				
Not Applicable				
Total Direct Costs				**$1,363,004**
Indirect Costs				
Total Project Costs				**$1,363,004**

2.2.1 Salaries, Wages, and Fringe Benefits

A portion of project work will be conducted by agency staff, including vendor procurement, meter installations, project management and grant administration and reporting activities. Related costs to be included as project costs are described below by agency.

SGVMWD is providing matching funds to cover a portion of Task 1 costs, to be performed in part by the General Manager and in part by a consultant who will be the acting Program Manager. Consultant cost details are described under 2.2.5. It is anticipated that the General Manager will contribute on average 2.5 hours per month over the 24-month project period, as shown below.

ENTITY	BUDGET ITEM DESCRIPTION	$/hr	Hrs	Costs
SGVMWD	Task 1 (General Manager), Grant Administration and Reporting	125	60	$7,500

The City of Alhambra is contributing staff time for grant management and reporting and project management (Task 1), as shown below.

ENTITY	BUDGET ITEM DESCRIPTION	$/hr	Hrs	Costs
Alhambra	Task 1 (Deputy Director), Grant Administration and Reporting	100	50	$5,000
Alhambra	Task 1 (Utility Maintenance Supervisor), Project Management	100	40	$4,000

The City of Monterey Park is contributing staff time for activities under Tasks 1 and Task 4, as shown below.

ENTITY	BUDGET ITEM DESCRIPTION	$/hr	Hrs	Costs
Monterey Park	Task 1 (Customer Service Representative), Project Management	52.37	100	$5,237
Monterey Park	Task 1 (Water Distribution Crew Leader), Grant Administration and Reporting	69.16	50	$3,458
Monterey Park	Task 4 (Water Distribution Maintenance Worker) – AMI Equipment and Software Installation	39.67	400	$15,868

Agency staff costs shown above are based on hourly rates. Fringe Benefits are assumed in labor rates provided in the salaries and wages and therefore are not provided separately in the overall project budget.

The bulk of project management and regular grant administration activities, including reporting will be performed within the agencies' regular operations and practice.

Therefore, these costs are not being included for all agencies as part of the proposed budget.

2.2.2 Travel

Consultant costs for travel are included in the line item for “Contractual”. SGVMWD and project partners anticipate visiting the project sites periodically during implementation, but travel within SGVMWD service areas is a part of normal staff activity and no reimbursement or match for staff travel is being sought.

2.2.3 Equipment

SGVMWD and the participating agencies are not requesting reimbursement for equipment usage for this project.

2.2.4 Supplies and Materials

Materials and supplies costs make up the largest portion of project cost and consist of meter equipment for implementation of the AMI/AMR system. The majority of meter installations will be performed by agency staff. Installations performed by contractors are described under 2.2.5. Meter equipment costs are described by agency below.

The City of Alhambra has estimated the cost of meter equipment based on quotes from its current vendor, National Meter and Automation.

ENTITY	BUDGET ITEM DESCRIPTION	$/unit	# of Meters	Costs
Alhambra	Task 4 (AMI Meter Equipment Purchase)	302	668	$201,736

The City of Monterey Park has estimated the cost of meter equipment based on quotes from Metron Farnier and agency experience in prior meter installation. Cost estimates are based on meter sizes and assume upgrades to 6 large meters with AMI.

ENTITY	BUDGET ITEM DESCRIPTION	$/unit	# of Meters	Costs
Monterey Park	Task 4 (AMI Meter Equipment Purchase)	$7,000	6	$42,000

The City of Sierra Madre has estimated the cost of meter equipment based on a quote (provided in Appendix C) from Metron Farnier for the purchase of 1,780 residential meters and 248 commercial meters. Costs shown below exclude shipping and taxes; the total project cost for the City is $899,657.

ENTITY	BUDGET ITEM DESCRIPTION	$/unit	# of Meters	Costs
Sierra Madre	Task 3 (AMI Meter Equipment Purchase)	NA	2,028	$899,657

2.2.5 Contractual/Construction

Contractual/Implementation work to be performed by contractors is includes work related to Tasks 1 and 4, described in Section 1.3.2 of this application. Cost estimates for contractors are based on ongoing contracts, such as with SGVMWD, or similar projects in the same geographic area and are considered fair and reasonable.

SGVMWD is providing matching funds to cover a portion of Task 1 costs, to be performed in part by the General Manager and in part by a consultant who will be the acting Program Manager. The consultant will contribute on average 3 hours per month over the 24-month period, as shown below.

ENTITY	BUDGET ITEM DESCRIPTION	$/hr	Hours	Costs
SGVMWD	Task 1 (Consultant/Program Manager)	$295	75	$22,125

The City of Alhambra will be contracting out the work for its share of grant administration and reporting (Task 1), and AMI installation and software set up (Task 4). Task 1 costs have been estimated based on consultant costs for similar projects and were calculated as 2.5 percent of Alhambra's total project costs. Task 4 costs have been estimated based on quotes from the City's current vendor, National Meter and Automation.

ENTITY	BUDGET ITEM DESCRIPTION	Computation	Costs
Alhambra	Task 1 (Grant Administration and Reporting - Consultant)	2.5% of total project costs	$7,368
Alhambra	Task 4 (AMI Installation)	Consultant cost estimate	$86,000
Alhambra	Task 4 (AMI software, meter data management system)	Consultant cost estimate	$7,000

The City of Sierra Madre intends to utilize a consultant for project management activities (Task 1). The City will also be contracting out the work for AMI installation and software set up (Task 4). Task 4 costs have been estimated based on quotes from the City's current vendor, Sensus.

ENTITY	BUDGET ITEM DESCRIPTION	Computation	Costs
Sierra Madre	Task 1. Project Management	2.5% of construction costs	$23,310
Sierra Madre	Task 4 (AMI Installation)	Consultant cost estimate	$32,745

All estimates are considered fair and reasonable.

2.2.6 Environmental and Regulatory Compliance Costs/Permitting

As described previously, the proposed project is anticipated to be exempt from CEQA and categorically excluded from NEPA and will therefore require minimal effort for filing applicable documentation. SGVMWD will not be seeking reimbursement for staff time related to this effort. No permits are required for implementation of the project. Therefore, no budget is included for this category.

2.2.7 Other Expenses

No other costs are included in the proposed budget.

2.2.8 Indirect Costs

No indirect costs are included in the proposed budget.

2.3 Total Cost

The total cost of the proposed project is **$1,363,004**. Funding sources for the proposed project currently include funding from SGVMWD and its three participating member agencies, and the requested funding from Reclamation. SGVMWD is requesting $300,000 in funding from Reclamation to fund the proposed project. This represents 22 percent of the total project costs. No other Federal funding has been requested or received for the proposed Project.

Section 3: Environmental and Cultural Resources Compliance

The project is Categorically Exempt from the California Environmental Quality Act (CEQA) and Categorically Excluded from National Environmental Policy Act (NEPA). The CEQA Categorical Exemption reference is Section 15301. Existing Facilities, part (b). The project is a Class I project which consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public and private structures, facilities, mechanical equipment, etc. The types of "existing facilities" is consistent with part (b) of Section 15301 which states "existing facilities of both investor and publicly-owned utilities used to provide electric power, natural gas, sewage, or other public utility services." For NEPA, the project meets the following categorical exclusion definitions: "minor construction activities associated with authorized projects which....merely augment or supplement..." and "maintenance, rehabilitation, and replacement of existing facilities which may involve a minor change in size, location, and/or operation."

1) Will the 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 project will consist of replacing, upgrading and/or retrofitting existing water service meters, which will not result in ground-disturbing work. As a result, the project will not impact the surrounding environment.

2) 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?

Work will be performed within already developed, urbanized areas where there is limited potential for critical habitat or otherwise suitable for sensitive species. Project activities, which do not include ground-disturbance, will not impact sensitive species or their habitat.

3) Are there wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.

The SGVMWD service area falls within the San Gabriel River and Rio Hondo watersheds. Project work will occur within already developed areas and will not involve

earth-disturbing work. As a result, the project will not have any impacts on any nearby wetlands or surface waters.

4) When was the water delivery system constructed?

The Devil Canyon-Azusa Pipeline, which delivers SWP water to the Main San Gabriel Basin, was constructed in 1969. Outlets and an extension to the pipeline were constructed in 1981, 1995, and 1998.

The City of Alhambra's water delivery system was constructed between 1924 and 1929, consisting of a Cast Iron grid system. The approximate age of meters within the system is 15 years.

The City of Monterey Park's water delivery system dates back to the 1929s. Approximately 72 percent of the transmission and distribution infrastructure was constructed before 1960.

Portions of the Sierra Madre system date back to past 1927. 50% of meters in the system range between 6 to 15 years of age, the remainder has been replaced within the last 6 years.

5) Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., head gates, 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 proposed project will not result in any modification of or effects to individual features of an irrigation system. The project will involve upgrades to water meters and will not involve irrigation systems.

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

Yes, buildings and features listed on the National Register for Historic Places are found within SGVMWD service area boundaries. However, the proposed project will not impact these sites and exact locations of meter upgrades are yet to be determined.

7) Are there any known archeological sites in the proposed project area?

Based on a review of the California Office of Historic Preservation list of historical resources, there are no known archaeological sites within the proposed project area. Additionally, the proposed project will occur within already developed areas and would not affect potential archeological sites.

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

The project will not have a disproportionately high or adverse effect on low income or minority populations. In fact, the project may provide financial benefits to customers receiving upgrades through timely leak detection and water conservation and reduced water bills.

9) Will the project limit access or ceremonial use of Indian sacred sites or result in other impacts on Tribal lands?

No, the project will not limit access to or ceremonial use of Indian sacred sites or result in other impacts on tribal lands. The project will involve meter upgrades or replacements of existing meters which would not result in adverse impacts on tribal lands.

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

The proposed project is not anticipated to contribute to the introduction, continued existence, or spread of, noxious weeds or non-native invasive species. No earth-disturbing work will occur as part of the project, which could contribute to spreading invasive species. As a matter of fact, this project may enhance customer engagement in agency conservation programs which include native plant landscaping, thereby resulting in benefits related to non-native and invasive species.

Section 4: Required Permits or Approvals

No permits or special approvals will be needed for implementation of the project. Project work will be conducted at existing meter locations that are fully within the respective Cities' authority.

Section 5: Letters of Support

Letters of support/commitment have been provided by the following agencies:

- City of Alhambra
- City of Monterey Park
- City of Sierra Madre

All letters can be found in Appendix B.

Section 6: Official Board Resolution

The Board of Directors of the San Gabriel Valley Municipal Water District will adopt a resolution authorizing the District to apply for a WaterSMART grant, to execute a cooperative agreement with Reclamation for implementation of the project and verifying the District's funding capability at its Board meeting on May 21, 2018. A draft of the resolution is provided in Appendix A. The final executed copy will be submitted to Reclamation within 30 days of the application submittal, or by June 10, 2018.

Section 7: Unique Entity Identifier, SAM and ASAP

7.1 Unique Entity Identifier

SGVMWD's DUNS No. is 081101941.

7.2 System for Award Management Registration

SGVMWD is registered in the System for Award Management (SAM) and will maintain an active SAM registration during the period of any federal assistance agreement.

7.3 Automated System Application for Payment Registration

SGVMWD has an active an account in the Automated System Application for Payment (ASAP) registration system with current information. The District will maintain an active ASAP account during the period of any federal assistance agreement.

Section 8: References

California Energy Commission (CEC). 2005. *California's Water - Energy Relationship.* www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

City of Alhambra. 2015 Urban Water Management Plan. Available at: https://wuedata.water.ca.gov/public/uwmp_attachments/9916196525/ALHAMBRA%202015%20FINAL%20UWMP%20%28wAppendix%29_2016-06-29.pdf

City of Monterey Park. 2016. Personal Communication, January 12, 2017.

City of Monterey Park. 2015 Urban Water Management Plan. Available at: https://wuedata.water.ca.gov/public/uwmp_attachments/5038678824/Volume%20I%20-%202015%20UWMP%20City%20of%20Monterey%20Park.pdf

City of Sierra Madre: https://wuedata.water.ca.gov/public/uwmp_attachments/4559125602/Sierra%20Madre%202015%20FINAL%20UWMP%20%28wAppendix%29_2016-06-28.pdf

Godwin, A. 2011. Advanced Metering Infrastructure: Drivers and Benefits in the Water Industry. http://www.waterworld.com/articles/print/volume-27/issue-8/editorial-features/special-section-advanced-metering-infrastructure/advanced-metering-infrastructure-drivers-and-benefits-in-the-water-industry.html

Reclamation, Sacramento and San Joaquin Basins Study, Report to Congress 2015. Prepared for: U.S. Department of the Interior, Bureau of Reclamation, Mid Pacific Region. Prepared By: CH2M Hill under Contract No. R12PD80946. https://www.usbr.gov/watersmart/bsp/docs/finalreport/sacramento-sj/Sacramento_SanJoaquin_TechnicalReport.pdf

SGVMWD 2015 Urban Water Management Plan. Available at: http://sgvmwd.org/Portals/0/FlexEvents/664/BoardMeeting/SGVMWD_2015%20Final%20UWMP%20(wAppendix)_2016-06-29.pdf

United States Environmental Protection Agency (EPA). 2013. Water Audits and Water Loss Control for Public Water Systems. https://www.epa.gov/sites/production/files/2015-04/documents/epa816f13002.pdf

US EPA (EPA). 2015. *eGRID2012 Summary Tables.* https://www.epa.gov/sites/production/files/2015-10/documents/egrid2012_summarytables_0.pdf

APPENDIX A

Draft Resolution to Execute Cooperative Agreement with the United States Bureau of Reclamation

RESOLUTION NO. XXX DRAFT

RESOLUTION OF THE BOARD OF DIRECTORS OF SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT AUTHORIZING THE DISTRICT'S APPLICATION, AND APPROVING NEGOTIATION AND EXECUTION OF A COOPERATIVE AGREEMENT WITH THE UNITED STATES BUREAU OF RECLAMATION FOR A WATERSMART: WATER AND ENERGY EFFICIENCY GRANT (FUNDING OPPORTUNITY NO. BOR-DO-18-F006)

WHEREAS, the San Gabriel Valley Municipal Water District ("District") is organized and operates pursuant to the Municipal Water District Act of 1911 commencing with Section 71000 of the California Water Code; and

WHEREAS, the District seeks to match local funds with federal funds provided by the United States Department of the Interior Bureau of Reclamation to increase efficient use of water, reduce energy demands; and

WHEREAS, the Board of Directors of the District has reviewed and approves of the application for the Department of the Interior Policy and Administration, Bureau of Reclamation WaterSMART: Water and Energy Efficiency Grants for Fiscal Year 2018, Funding Opportunity Announcement # BOR-DO-18-F006; and

WHEREAS, the District agrees to the administration and cost sharing requirements of the WaterSMART Grant criteria,

NOW, THEREFORE, be it resolved, determined and ordered by the Board of Directors of the San Gabriel Valley Municipal Water District, as follows:

Section 1. The District is hereby authorized to receive, if awarded, the WaterSMART: Water and Energy Efficiency Grant funding in the amount of $300,000 and to enter into an agreement with the Bureau of Reclamation for the receipt and administration of said grant funds.

Section 2. If awarded, the above-referenced grant, the General Manager, or his designee, is hereby authorized to take any and all action which may be necessary for the completion and execution of the project agreement and to take any and all other action which may be necessary for the receipt and administration of the grant funding in accordance with the requirements of the Bureau of Reclamation.

Section 3. This resolution officially becomes a component part of the District's grant application.

Section 4. If any section, subsection, clause or phrase in this Resolution is for any reason held invalid, the validity of the remainder of this Resolution shall not be affected thereby. The Board of Directors hereby declares that it would have passed this Resolution and each section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof be held invalid.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the San Gabriel Valley Municipal Water District held on May 21, 2018.

_____
President

ATTEST:

_____
Secretary

APPENDIX B

Letters of Support

City of Alhambra
Department of Utilities

May 1, 2018

Bureau of Reclamation
Financial Assistance Support Section
Attn: Mr. Darren Olson
Mail Code: 84-27814
PO Box 25007
Denver, CO 80225

Subject: Support for the San Gabriel Valley Municipal Water District Regional AMI/AMR Project

To Whom It May Concern:

On behalf of the City of Alhambra we would like to express our strong support for the San Gabriel Valley Municipal Water District (SGVMWD) Regional Advanced Metering Infrastructure/Automatic Meter Reading (AMI/AMR) Project, and the application for funding through the Bureau of Reclamation's FY2018 Water and Energy Efficiency Grant Program BOR-DO-18-F006.

The SGVMWD Regional AMI/AMR Project is a regional effort to assist the SGVMWD's retail member agencies, Alhambra, Azusa, Monterey Park, and Sierra Madre increase water use efficiency and reduce water loss through the purchase and installation of new water meters for their service areas. The SGVMWD imports State Water Project (SWP) which it provides to the member agencies by groundwater recharge. The member agencies then distribute water directly to customers. As a region reliant on groundwater as its primary source, and given recent drought conditions, there is a vital need for the agencies to manage their resources as efficiently as possible.

Specifically, The City of Alhambra, is looking to implement an AMI program which includes the purchase and installation of 668 new water meters for residential, commercial, and irrigation users, along with new smart meter software. The purpose of the AMI program is to increase water conservation and water use efficiency by providing real-time water consumption data to the City and its customers. This new meter system will improve the City's ability to detect leaks, audit water usage, and accurately meter usage at each connection.

Gateway to the San Gabriel Valley

111 South First Street Alhambra California 91801-3704

Project Benefits
Specific benefits of the Project include the following:

- Water conservation will be improved by increasing customer understanding of their water uses compared to neighbors, leak detection enabled by real-time water consumption data, and public education through water audits.

- The project addresses the water-energy nexus through reduced water use through conservation which provides a linear reduction in energy use associated with source production, conveyance, and treatment requirements.

- The project provides benefits to endangered species as endangered species recovery is maintained by reducing water consumption.

The SGVMWD is the project applicant, and as the regional water wholesale agency, supports and encourages its member agencies in implementing demand management measures such as metering and is committed to use good-faith efforts to help implement such measures as demonstrated by this regional application. The City of Alhambra is pleased to participate with SGVMWD in this effort. The City of Alhambra is willing to commit $250,000.00 in local city funding to more than match the city's $125,000.00 share of the grant, should the grant be awarded for the SGVMWD Regional AMI/AMR Project.

Thank you for the opportunity to express our support for the SGVMWD Regional AMI/AMR Project. We strongly urge your thoughtful consideration of the Project.

Sincerely,

Martin Ray
Director of Utilities
City of Alhambra

CITY OF MONTEREY PARK
320 West Newmark Avenue • Monterey Park • California 91754-2896
www.montereypark.ca.gov

4/26/18

Bureau of Reclamation
Financial Assistance Support Section
Attn: Mr. Darren Olson
Mail Code: 84-27814
PO Box 25007
Denver, CO 80225

Subject: Support for the San Gabriel Valley Municipal Water District Regional AMI/AMR Project

To Whom It May Concern:

On behalf of The City Of Monterey Park, we would like to express our strong support for the San Gabriel Valley Municipal Water District (SGVMWD) Regional Advanced Metering Infrastructure/Automatic Meter Reading (AMI/AMR) Project, and the application for funding through the Bureau of Reclamation's FY2018 Water and Energy Efficiency Grant Program BOR-DO-18-F006.

The SGVMWD Regional AMI/AMR Project is a regional effort to assist the SGVMWD's retail member agencies, Alhambra, Monterey Park, and Sierra Madre increase water use efficiency and reduce water loss through the purchase and installation of new water meters for their service areas. The SGVMWD imports State Water Project (SWP) which it provides to the member agencies by groundwater recharge. The member agencies then distribute water directly to customers. As a region reliant on groundwater as its primary source, and given recent drought conditions, there is a vital need for the agencies to manage their resources as efficiently as possible.

Specifically, Monterey Park, is looking to implement an AMR program which includes the purchase and installation of 6 new large water meters for residential, commercial, and irrigation users, along with current smart meter software. The purpose of the AMR program is to increase water conservation and water use efficiency by providing real-time water consumption data to the City and its customers. This new meter system will improve the agencies' ability to detect leaks, audit water usage, and accurately meter usage at each connection.

The results for installing AMR/AMI meters into our water system has proven to have a significant potential for water savings. We have been able to identify and address extremely small leaks that would have gone undetected with the old style of meter. The low flow accuracy of these meters have

helped our unaccounted water totals to drop down significantly. This grant money will help to complete a AMR meter replacement program that has already taken place in our City so far we have changed out all meters 2" and lower.

Project Benefits
Specific benefits of the Project include the following:

- Water conservation will be improved by increasing customer understanding of their water uses compared to neighbors, leak detection enabled by real-time water consumption data, and public education through water audits.

- The project addresses the water-energy nexus through reduced water use through conservation which provides a linear reduction in energy use associated with source production, conveyance, and treatment requirements.

The SGVMWD is the project applicant, and as the regional water wholesale agency, supports and encourages its member agencies in implementing demand management measures such as metering and is committed to use good-faith efforts to help implement such measures as demonstrated by this regional application. Monterey Park is pleased to participate with SGVMWD in this effort. Monterey Park is willing to commit $50k in local city funding to match the city's $50k share of the grant, should the grant be awarded for the SGVMWD Regional AMI/AMR Project.

Thank you for the opportunity to express our support for the SGVMWD Regional AMI/AMR Project. We strongly urge your thoughtful consideration of the Project.

Sincerely,

George Noriega
Consumer Service Supervisor
City Of Monterey Park

City of Sierra Madre

Office of the Mayor

May 1, 2018

Bureau of Reclamation
Financial Assistance Support Section
Attn: Mr. Darren Olson
Mail Code: 84-27814
PO Box 25007
Denver, CO 80225

Subject: Support for the San Gabriel Valley Municipal Water District Regional AMI/AMR Project

To Whom It May Concern:

On behalf of the City of Sierra Madre, we would like to express our strong support for the San Gabriel Valley Municipal Water District (SGVMWD) Regional Advanced Metering Infrastructure/Automatic Meter Reading (AMI/AMR) Project, and the application for funding through the Bureau of Reclamation's FY2018 Water and Energy Efficiency Grant Program BOR-DO-18-F006.

The SGVMWD Regional AMI/AMR Project is a regional effort to assist the SGVMWD's retail member agencies, Alhambra, Monterey Park, and Sierra Madre increase water use efficiency and reduce water loss through the purchase and installation of new water meters for their service areas. The SGVMWD imports State Water Project (SWP) which it provides to the member agencies by groundwater recharge. The member agencies then distribute water directly to customers. As a region reliant on groundwater as its primary source, and given recent drought conditions, there is a vital need for the agencies to manage their resources as efficiently as possible.

Specifically, Sierra Madre, is looking to implement an AMI program which includes the purchase and installation of 2,028 new water meters for residential, commercial, institutional and irrigation users, along with new smart meter software. The purpose of the AMI program is to increase water conservation and water use efficiency by providing real-time water consumption data to the City and its customers. This new meter system will improve the agencies' ability to detect leaks, audit water usage, and accurately meter usage at each connection.

232 West Sierra Madre Boulevard, Sierra Madre, CA 91024
Telephone (626) 355-7135

Sierra Madre historically produced its entire water supply from the Santa Anita Subarea of the East Raymond Basin. The historic drought of the last decade has caused our primary water source to become depleted. The City of Sierra Madre now must import over 50% of its needed water supply from the State Water Project and the Colorado River. To the extent that water conservation can be improved through the use of AMI, the City's impact on the State Water project and Colorado River resources can be reduced. Additionally, the reduced demand on the Basin could allow for the restoration of the basin to healthy water levels.

Project Benefits
Specific benefits of the Project include the following:

- Water conservation will be improved by increasing customer understanding of their water uses compared to neighbors, leak detection enabled by real-time water consumption data, and public education through water audits.

- The project addresses the water-energy nexus through reduced water use through conservation which provides a linear reduction in energy use associated with source production, conveyance, and treatment requirements.

The SGVMWD is the project applicant, and as the regional water wholesale agency, supports and encourages its member agencies in implementing demand management measures such as metering and is committed to use good-faith efforts to help implement such measures as demonstrated by this regional application. The City of Sierra Madre is pleased to participate with SGVMWD in this effort. Sierra Madre City Council is willing to commit $125,000 in local city funding to match the city's $125,000 share of the grant, should the grant be awarded for the SGVMWD Regional AMI/AMR Project.

Thank you for the opportunity to express our support for the SGVMWD Regional AMI/AMR Project. We strongly urge your thoughtful consideration of the Project.

Sincerely,

Denise Delmar

Denise Delmar
Mayor
City of Sierra Madre

232 West Sierra Madre Boulevard, Sierra Madre, CA 91024
Telephone (626) 355-7135

APPENDIX C

Vendor Quotes

NATIONAL METER & AUTOMATION

QUOTE

3 Faraday, Suite A
Irvine, California 92618
Phone: 949-445-7171
Fax: 949-595-0958

QUOTE NUMBER: 042618LE-CAB
DATE: Thursday, April 26, 2018
QUOTED BY: Lisa Engstrom
REQUESTED BY: David Dolphin
PHONE: 626-300-1571
EMAIL: ddolphin@cityofalhambra.org

BILL TO:
CITY OF ALHAMBRA WATER DEPT
111 South First Street
Alhambra, CA 91801

SHIP TO:
CITY OF ALHAMBRA WATER DEPT

SALESPERSON	PAYMENT TERMS	SHIPPING METHOD	SHIPPING TERMS	Subject to Review After:
Lisa Engstrom	Net 30 Days	TBD	FOB Factory	Sunday, June 30, 2019

QTY	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
361	5/8" X 3/4" Badger Meter M25 Meter (NSF 61-G), HRE Register (8 Dial) Cubic Feet, Plastic Lid & Shroud, With Nicor Connector & 6 Ft. Wire	$ 125.00	$ 45,125.00
265	1" Badger Meter M55 Meter (NSF 61-G), HRE Register (8 Dial) Cubic Feet, Plastic Lid & Shroud, With Nicor Connector & 6 Ft. Wire	$ 208.00	$ 55,120.00
31	1 1/2" Badger Meter M120 Meter (NSF 61-G), Elliptical Long, HRE Register (8 Dial) Cubic Feet, Plastic Lid & Shroud, With Nicor Connector & 6 Ft. Wire	$ 439.00	$ 13,609.00
9	2" Badger Meter M170 Meter (NSF 61-G), Elliptical Long, HRE Register (8 Dial) Cubic Feet, Plastic Lid & Shroud, With Nicor Connector & 6 Ft. Wire	$ 618.00	$ 5,562.00
2	4" Badger Meter Turbo Meter (NSF 61-G), Round With Test Plug Without Integral Strainer, HRE Register (8 Dial) Cubic Feet, Plastic Lid & Shroud, With Nicor Connector & 6 Ft. Wire	$ 1,382.00	$ 2,764.00
TBD	Registration Only for Sizes 5/8"- 1" Badger Postive Displacement Meters, HRE Register (8 Dial) Cubic Feet, With Nicor Connector & 6 Ft. Wire (Register Only, No Meter Body)*	$ 64.00	

NATIONAL METER & AUTOMATION

QUOTE

3 Faraday, Suite A
Irvine, California 92618
Phone: 949-445-7171
Fax: 949-595-0958

QUOTE NUMBER: 042618LE-CAB
DATE: Thursday, April 26, 2018
QUOTED BY: Lisa Engstrom
REQUESTED BY: David Dolphin
PHONE: 626-300-1571
EMAIL: ddolphin@cityofalhambra.org

BILL TO:
CITY OF ALHAMBRA WATER DEPT
111 South First Street
Alhambra, CA 91801

SHIP TO:
CITY OF ALHAMBRA WATER DEPT

SALESPERSON	PAYMENT TERMS	SHIPPING METHOD	SHIPPING TERMS	Subject to Review After:
Lisa Engstrom	Net 30 Days	TBD	FOB Factory	Sunday, June 30, 2019

TBD	Registration Only for Sizes 1 1/2" & 2" Badger Postive Displacement Meters, HRE Register (8 Dial) Cubic Feet, With Nicor Connector & 6 Ft. Wire (Register Only, No Meter Body)*	$ 70.00	
TBD	Registration Only for Sizes 2"- 10" Badger Turbo Meters, HRE Register (8 Dial) Cubic Feet, With Nicor Connector & 6 Ft. Wire (Register Only, No Meter Body)*	$ 88.00	
668	LTE Orion Cellular Endpoint With Nicor Connector (Add 1 Per Meter)	$ 120.00	$ 80,160.00
668	Beacon Cellular (15 Min Interval) Reads & Data, Fully Hosted Beacon Software/ Webportal For Utility Access and "Eye On Water" For End-User Portal Access (All Inclusive- No Other Annual Or Maintenace Fees Applicable)	$ .89*/ per service, per month	$ 594.52 /per month or $ 7,134.24 /annually
1	Beacon Engagement Fee for Software Set Up- **Loyalty Customer** (One Time Fee Only For Up To 25,000 Services)	$ 4,465.00	$ 4,465.00
1	Training for all Software and Services (One Time Fee Only)	$ 2,300.00	$ 2,300.00

NATIONAL METER & AUTOMATION

QUOTE

3 Faraday, Suite A
Irvine, California 92618
Phone: 949-445-7171
Fax: 949-595-0958

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	Freight included on orders of $25,000 or more.		
		SUBTOTAL*	$ 209,105.00
Notes:		**TAX (9.5%)**	
***Monthly/annual ongoing software fees not added into total and will be billed separately.**		**FREIGHT**	add
		TOTAL	

THANK YOU FOR YOUR BUSINESS!

Standard Terms & Conditions www.nationalmeter.com/legal

April 25, 2018

To: Jose Reynoso

Thank you for considering a Water FlexNet solution from Sensus.

Recently, City of Sierra Madre W.D. personnel conducted internal tests and completed an input form to determine the financial benefits of a system-wide Smart Metering program. Using that information and software specifically developed for this purpose we projected the financial impact to your utility over a 20 year period.

This report is a comprehensive summary of the analysis. Also available are reports and graphs that allow you to review how we arrived at our conclusions. All estimates of revenue enhancements and cost reductions apply exclusively to the use of Sensus and its approved partners products and services.

Additionally, the proposed system will allow your utility to optimize other potential benefits such as:

- Empower end users with timely information to reduce water and energy usage
- Consideration of different rate structures based on "Time of Use"
- Effective preventative maintenance measures
- Numerous leak detection alternatives
- Reduction of carbon footprints
- Enhanced customer service
- Demand reads
- Backflow monitoring
- Tamper Detection

To this end the application of Sensus Smart Metering Technologies will engage the utility's desire to overcome the hurdles associated with aging infrastructure, compliance with today's and future regulatory requirements, and preserve vital natural resources.

Your local Sensus representative is available to discuss the details of this analysis. We very much look forward to the opportunity of working with your utility.

Sincerely,

William Boyd

Sr Account Development Manager

Sensus, a Xylem Company

Financial Benefits Analysis

City of Sierra Madre W.D.

Table of Contents

Financial Benefits Analysis

City of Sierra Madre W.D.

The following projection is based upon a 12-month Replacement Program

Total Number of Residential Water Meters to be Replaced:	1,780
Total Number of Commercial Water Meters to be Replaced:	248

Summary of Financial Improvement over 20 Years

		Present Value at 0.00 %
Meter Revenue Increase	$10,137,022	$10,137,024
Operating Cost Savings	$532,031	$532,031
Total Benefits	$10,669,053	$10,669,055
Net Outlay for Equipment	$899,657	$899,657
Installation Costs	$32,745	$32,745
Total Costs	$932,402	$932,402
Total Net Benefits	**$9,736,652**	**$9,736,653**

It is estimated that the **cash flow** from the replacement program will be positive beginning in **Year 1**.

The **payback** on all equipment and installations, totaling $932,402, is estimated at **2 years and 11 months**.

The above increased revenue and savings estimates are based on a 20 year projection. We calculated present value of the benefits received in order to convert the cash flow into its equivalent in today's dollars. For a more detailed summary please review the "Summary of Benefits" reports and graphs.

Financial Benefits Analysis

City of Sierra Madre W.D.

Estimated Water Meter Replacement Revenue Improvement

Average Accuracy of Present Water Meters:	91.64 %
Current Annual Water Revenue Loss:	$345,150
Increased Revenue over a 20-year water meter Change-out to Sensus Meters:	$10,137,022

Water meter inaccuracy is estimated to be costing the utility approximately $345,150 per year. In addition, deterioration can be expected as the meters currently in the system continue to age. The analysis indicates that your system could recognize an estimated $10,137,022 in increased water revenues over the next 20 years when replaced with Sensus meters.

An estimate of 91.64 % was used for current meter accuracy. This estimate is based on either a statistical sampling of your utilities current meter population or tests conducted by utilities around the country on meters being considered for replacement. The accuracy of the systems current meters is compared to the performance of new Sensus meters. Performance projections are based on tests of our meters that are in service around the country and supported by engineering endurance testing.

These performance projections apply exclusively to Sensus meters due to the unique long-life and low-flow accuracy features engineered into our products.

For further information on increased revenue projections, please review the "Increased Revenue" report and graphs.

Financial Benefits Analysis

City of Sierra Madre W.D.

Operating Cost Savings

Current System Operating Costs over 20 years:	
Meter Reading Costs (includes personnel costs)	$668,420
Repair Costs	$200,000
Testing Costs	$0
Office Costs	$0
Maintenance Costs	$0
Total Current Operating Costs	**$868,420**
Proposed System Operating Costs over 20 years:	
Meter Reading Costs	$0
Repair Costs	$8,389
Testing Costs	$0
Office Costs	$0
Communications, Rental, Maintenance, Support Fees	$0
Hosting Fees	$328,000
Total Proposed Operating Costs	**$336,389**
Operating Cost Savings over 20-year Program from Change-out to Sensus Meters	**$532,031**

The costs of the present method of meter reading and billing were provided as input. Meter Reading Cost reductions are a result of improvement in meter reading efficiency, reduction of callbacks and elimination of any manual data processing.

Current average annual meter shop and field service costs were used to project 20-year Repair Costs of $200,000 if the current system is left in place. Because of the unique design of the iPERL, OMNI and accuMAG meters, a change-out to Sensus meters, with the possible exception of vandalism, will dramatically reduce or eliminate the number of meters requiring maintenance over the next 20 years.

Accuracy testing of industrial and commercial meters is recommended per AWWA M6 manual and Sensus. The cost of the recommended interval testing has been accounted for in both the current and proposed system projected operating costs. If, historically, the utility chose not to follow recommended testing for commercial and industrial meters the analysis did not adjust for costs that would have been incurred. Therefore most likely the costs of maintaining the current system have been understated.

It is important to note that the system being considered allows for customer service improvements less tangible but no less important. Elimination of intrusive demand and final reads, estimated bills and the reduction of response time to customer inquiries will result in substantially fewer complaints and higher customer satisfaction.

For further information, please refer to the "Current Annual Operating Costs" and "Proposed Annual Operating Costs" detail reports and graphs.

Financial Benefits Analysis

City of Sierra Madre W.D.

Equipment Investment

Financing Method Proposed	Third Party Financing
Total Meter Costs	$339,631
Total Water Meter Conversion Costs	$0
Cost of FlexNet Infrastructure	$155,872
Cost of SmartPoints	$346,500
Cost of Ancillary Equipment	$0
Scrap Value of Meters to be Replaced	$11,300
Net Outlay for Total Program	**$899,657**

The initial purchase price of Sensus equipment reflects current pricing based on the program upgrade timing and quantity of product required.

For further information, please refer to the "Equipment Investment" detail report and graphs.

Financial Benefits Analysis

City of Sierra Madre W.D.

Installation Costs

Financing Method Proposed	Third Party Financing
Total Water Meter Installation Cost	$0
Total Water Meter Conversion Installation Cost	$0
Cost of FlexNet Infrastructure Installation	$30,000
Cost of SmartPoint Installation	$0
Cost of Ancillary Equipment Installation	$0
Total Installation Cost for program	**$32,745**

The estimated costs for all installed or converted equipment is based on the timing of the project when presented.

For further information, please refer to the "Outlay for Installation" detail report and graphs.

Conclusion

It is important to remember that the results projected in this report are estimates based on input provided or national averages. Whether you used your own accumulated data or the suggested national averages, you could find that the cost of your current system is higher than that represented here.

It is also important to note that there are areas of benefit that have not been considered but are no less important. The Sensus system has been designed to support your utility's "Green Initiatives" such as but not limited to water and energy conservation and reduction of greenhouse gases.

Finally, implementation of this type of system allows your utility to offer their customers "the consumer" improved options for conservation, bill payment, leak detection, security, and ultimately improved relations with your utility.

Sensus thanks you for the opportunity to present our system. If you have any questions on the Financial Analysis please contact:

Steve Kamiyama

Aqua-Metric Sales Company

4050 Flat Rock Drive

Riverside CA 92505

951-233-9545

Steve.Kamiyama@aqua-metric.com

APPENDIX D

Mandatory Federal Forms

Uploaded to Grants.gov via webform

San Gabriel Valley Municipal Water District serves the following:

Alhambra, CA

Monterey Park, CA

Sierra Madre, CA