Advanced Meter Infrastructure Conversion, Phase III

March 19, 2019

2019 WaterSmart Water and Energy Efficiency Grant
U.S. Bureau of Reclamation

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List of Acronyms

AMI	Advanced Metering Infrastructure
AF	Acre-feet
AFY	Acre-feet per year
BA	Biological Assessment
BMP	Best Management Practices
CEQA	California Environmental Quality Act
CIP	Capital Improvement Plan
CMWD	Casitas Municipal Water District
CUWCC	California Urban Water Conservation Council
EPA	U.S. Environmental Protection Agency
IRWMP	Integrated Regional Water Management Plan
MFR	Multi-Family Residential
mg	million gallons
MIU	Meter Interface Unit
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NOAA Fisheries	National Oceanic Administration, National Marine Fisheries
SFR	Single Family Residential
UWMP	Urban Water Management Plan

Section 1: Technical Proposal and Evaluation Criteria

1.1 Executive Summary

Date: March 19, 2019

Applicant: Ventura Water (aka City of San Buenaventura)

Applicant City, County, State: Ventura, County of Ventura, California

Project Location: Ventura Water Service Area, Ventura, CA

Project Name: Advanced Meter Infrastructure (AMI) Conversion, Phase III

Project Duration: 18 months

Estimated Project Completion Date: May 31, 2021

Funding Group: I

Project Summary:

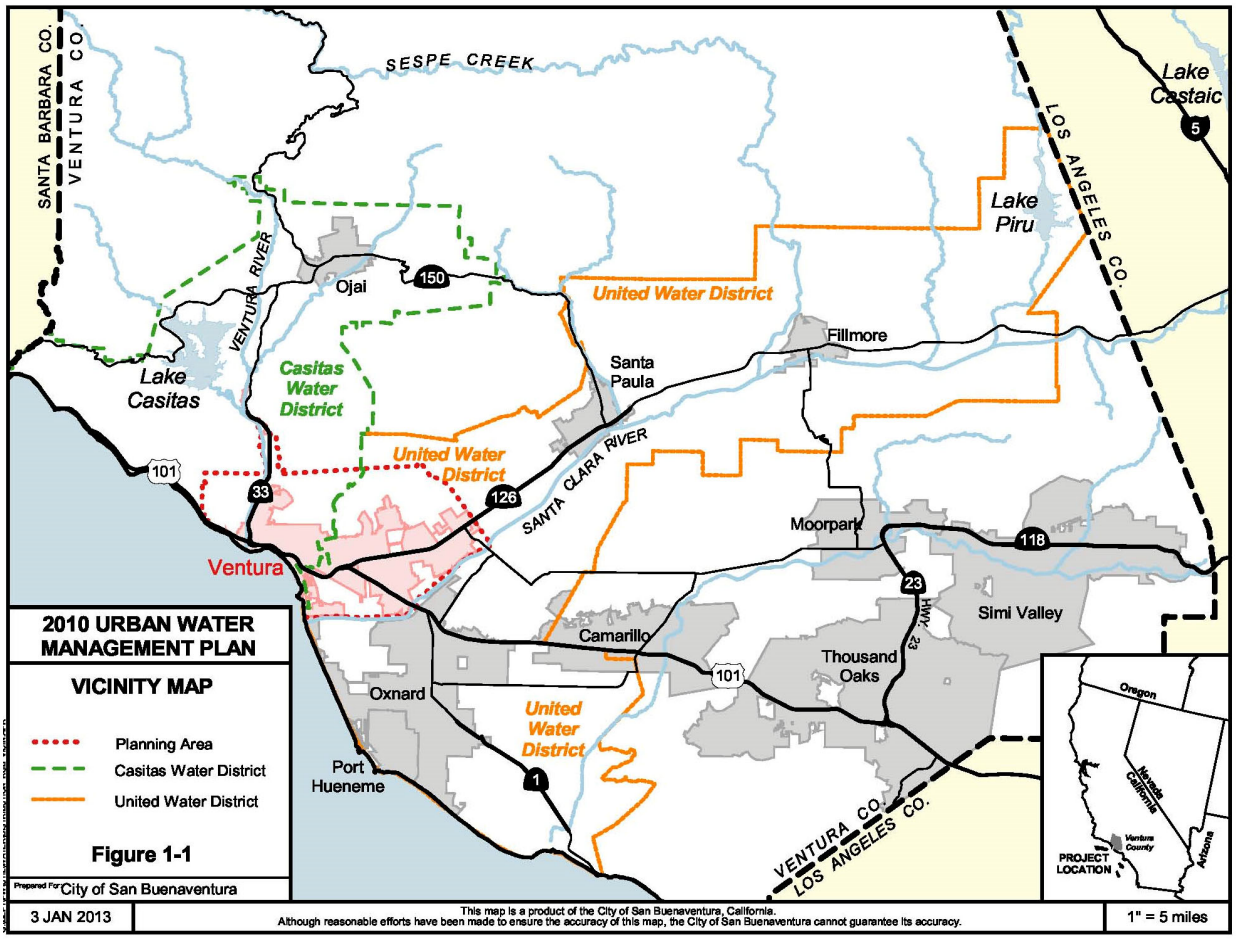
The City of Ventura is seeking grant funding assistance to complete the final phase of the of the Ventura AMI meter conversion project. The proposed project will result in the installation of 10,112 new AMI meters to replace the existing manually read meters, many of which are twelve or more years old. Upon completion of this phase, 100 percent of the city's customer connections will have been converted to AMI. This project will allow Ventura Water to save an estimated 258.69 AF of water per year and approximately 168,665.88 kWh of electricity annually.

These improvements support Reclamations objectives to leverage local funds and resources to conserve and use water more efficiently, improves energy efficiency, benefits the endangered southern California Steelhead, reduces greenhouse gases.

This project is not located on a Federal facility.

1.2 Background Data

The City of Ventura is located 62 miles north of Los Angeles and 30 miles south of Santa Barbara along the California coastline. The City's planning area is bounded by the Ventura River on the west, Foster Park and the Ojai Valley to the north, Franklin Barranca and the Santa Clara River to the east, with the Pacific Ocean as the southern boundary. The total planning area encompasses approximately 40 square miles.



In 1923, the City acquired the water system, along with its water rights from the Ventura River, from the Southern California Edison Company and assumed the responsibility of providing water to City residents.

In 1960, the City began to purchase surface water from Casitas Municipal Water District to supplement its water supplies. As development quickly expanded to the east, the existing water systems and groundwater rights of the Saticoy and Mound Water Companies were purchased to accommodate this growing water demand. Since then, the City has worked to join the systems to improve the reliability of the overall water infrastructure and operations. Groundwater supplies are from three groundwater basins—Mound, Oxnard Plain, and the Santa Paula. Water from these sources' accounts for approximately 9,700 AFY, or approximately half of the City's total supply.

In 1964, Ventura County Flood Control District contracted with the State of California for future delivery of up to 20,000 AFY of California State Water Project (SWP) water to Ventura County. In 1971, administration of the contract for SWP water was assigned to the Casitas Municipal Water District. The City executed an agreement with the Casitas Municipal Water District (CMWD) and the Department of Water Resources (DWR) to allocate 10,000 AFY of the entitlement to the City of Ventura. This obligation extends to 2035.

In the contract with CMWD, Ventura retains full authority and responsibility for advance scheduling of its SWP water and for determining the point and method of delivery. To date, the City has not received delivery of its annual SWP allocations. In 1999, the City became a signatory to the SWP Monterey Amendment Settlement Agreement, which allows the City and other SWP contractors to sell surplus allocated water back to the SWP pool of supplies.

The Monterey Amendment Settlement Agreement to the SWP contracts in 1999 provided the City a formal mechanism to allow it to place its annual SWP water allocation into a "turn back" pool to be purchased by other SWP contractors. The City has taken part in the "turn back" pool over the past several years, which has allowed the City to recoup a small part of its annual SWP payment obligation. The City has also worked with the United Water Conservation District (United), which requests (depending on local hydrologic conditions and percent of SWP water available each year) some portion of the City's annual allocation at the "turn back" pool rate. This provides water recharge benefits to the County area as a whole.

The City, CMWD, and United (referred to as the Joint Agencies) pay annual contractual fees to DWR, which cover construction costs for SWP facilities and administration to deliver allocations of water throughout the state.

There are presently three (3) distinct water sources providing water to the City water system:

1) Casitas Municipal Water District (Lake Casitas),
2) Ventura River Foster Park Area via surface water intake and the Upper Ventura River Groundwater Basin/Subsurface intake and wells,
3) Groundwater
    a. Mound Groundwater Basin (United)
    b. Oxnard Plain Groundwater Basin (Fox Canyon Aquifer), and
    c. The Santa Paula Groundwater Basin.

The City currently purchases water from Casitas through an agreement that requires a minimum purchase of 6,000 AFY and permits the purchase of up to 8,000 AFY. In a typical year, the City purchases 6,000 AF of water annually.

The United Water Conservation District is primarily a groundwater recharger in central Ventura County. The City owns 13 groundwater wells located within the UWCD boundaries and are therefore subject to semi-annual extraction fees.

The balance of City's water is from the Ventura River. Water from this source accounts for approximately 20 percent the City's water supply. However, this amount fluctuates from as low as 1,298 AFY to 6,700 AFY depending on local hydrology and operational constraints.

The City water system is a complex system of 16 pressure zones, 13 wells, 21 booster stations, approximately 380 miles of pipelines ranging from 4-inches to 36-inches in diameter, and a total storage capacity of approximately 52 million gallons (mg) in 32 tanks and reservoirs serving an estimated population of 113,500 and 31,835 water service connections, inclusive of the population of Ventura plus several

unincorporated County areas. The system delivers water from sea level to a maximum elevation of over 1,000 feet. The City operates three purification facilities, including one membrane filtration treatment plant for surface water sources on the west side of the City, and two iron/manganese removal treatment plants for groundwater sources on the east side. The City also maintains and operates the Ventura Water Reclamation Facility, which discharges tertiary treated for recycled water distribution for large landscape irrigation and direct discharge to wetlands and to the Santa Clara River Estuary.

Water service is provided to all residential, commercial, industrial and irrigation customers; including fire protection users. The City's water use is summarized below.

Table 1: Water Demand by Customer Type

Customer Type	Average Connections*	Average Water Consumption (AFY)**
Residential	23,072 – Single-Family 2,741 – Multi-Family	8,507.46
Commercial	2,602	3,048.25
Industrial	8	335.01
Institutional/Government	184	464.75
Large Landscape	252	407.08
Other/Miscellaneous[1]	3,179	91.20
Water Loss		882.97
Subtotal		13,736.72
Recycled Water	15	600
Total		14,336.53

* Connection data based on the three-year average (Fiscal Years 2016 to 2018) with adjustments.

** Average based on three years of actual consumption from calendar years 2016 through 2018.

1.2.1 Past Working Relationship with Reclamation

The City of Ventura recently completed Title XVI grant funded Recycled Water Delivery Project Expansion Feasibility Study; agreement number R12AC35349. This was a facility planning study for expanding recycled water deliveries to the Santa Clara River estuary. This study was successfully completed in May 2014 and accepted by Reclamation.

The City was also awarded two (2) Water and Energy Efficiency Grants for the 2015 funding cycles. These agreement numbers are R15AP0097 for a System Optimization Improvements and R15AP0095 for the Ventra Be Water Wise Incentive Program. The System Optimization Improvement Project scope includes the replacement of production meters and the rehabilitation of a failing well; resulting in an estimated savings of 516.66 AFY and 373,253 kWh annually. The Water Wise Incentive Program is a water conservation rebate program that provides rebates to customers

[1] Temporary construction, (in 2016 only), fire line meters, water rights, and Alta Mutual Water Company customers (in 2016 only).

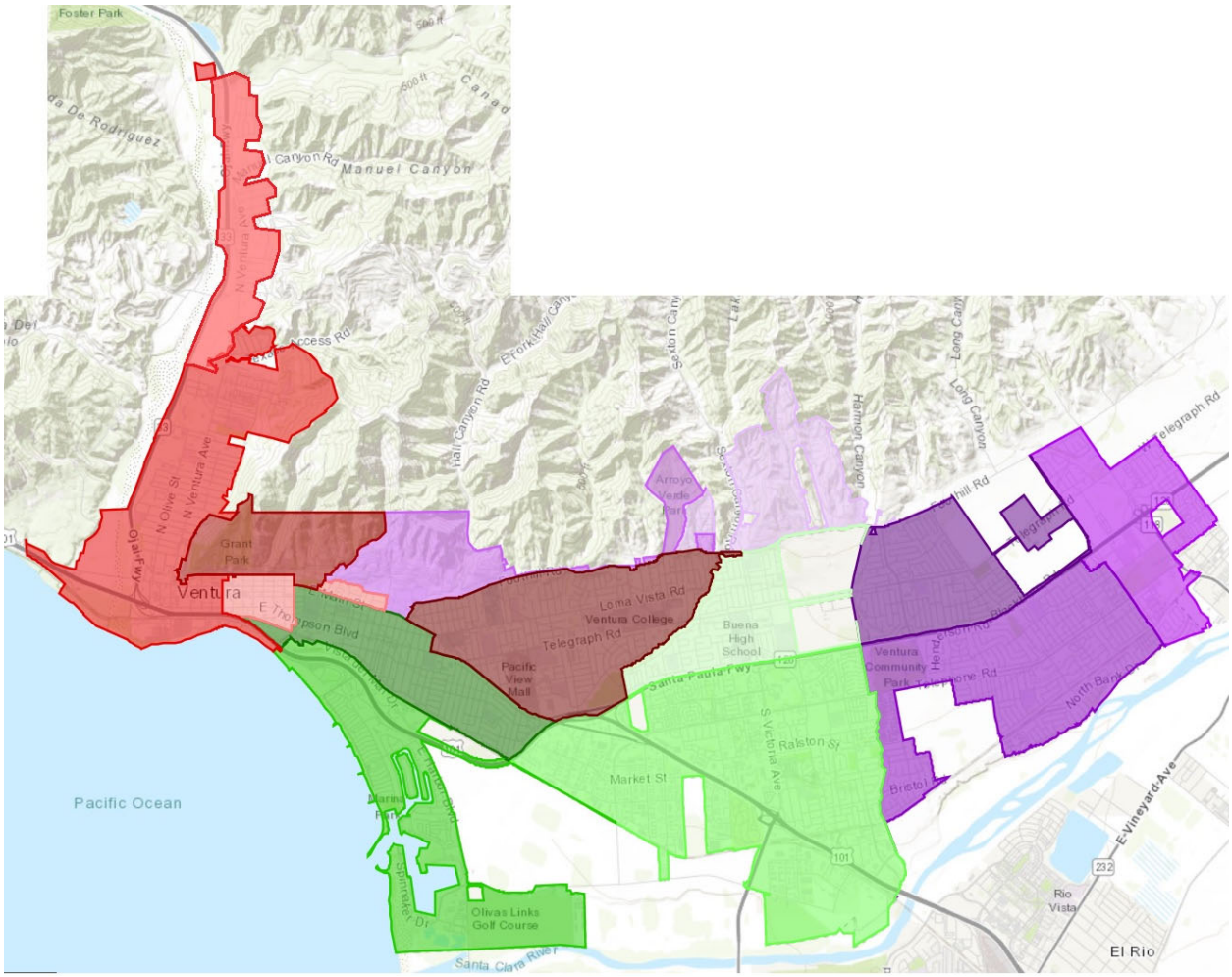
for turf removal, smart irrigation controllers, low-flow sprinklers, and HE clothes washers. The System Optimization Improvement Project is complete, and the final report is being prepared and the Ventura "Be Water wise Incentive Program" was completed in the fall of 2018 and the final report has been accepted by Reclamation.

An additional Water and Energy Efficiency Grant was awarded under the 2017 funding cycle for phase II of the AMI Implementation under agreement number R17AP00123. This project is in progress and planned to be completed in the summer 2019.

1.3 Technical Project Description

The project site for this third phase are in green. The red shaded areas are currently in progress and the purple area will be a future phase.

Figure 2: Project Site



Ventura Water relies heavily on accurate and timely meter reading for the collection of approximately $60 million budgeted in annual revenue that is needed to pay for the water and wastewater systems. The Advanced Metering Infrastructure (AMI) Project consists of replacing manually-read water meters with meters that will automatically relay readings utilizing a system of radio antennas or "fixed network". The new meters will automatically relay data on water usage to the City's water billing system. The meters can also be read by driving by them with special radio equipment in case the fixed network system is malfunctioning (i.e. after a major earthquake).

This project represents the final phase to convert the residential water meters to AMI; 10,112 meters will be replaced in this phase. The proposed project is to replace both

single-family and multi-family residential customer meters, which range in size from ¾-inch through 1-inch, plus small commercial meters up to 2 inches. It is suspected that several of these meters are not registering accurately due to their age and the new AMI meters will also be able to detect leaks, resulting in reduced water losses. It is estimated that a 7% reduction in water use will be achieved due to quick identification of water leaks and increased awareness by customers on water use with an AMI system in place. Other water utilities have reported water savings of 10 percent or greater, however, we estimate that 7 percent is a more accurate savings for our community.

Over the course of the past several years, staff has been investigating the potential benefits of AMI and subsequently developed specifications and requested price proposals from vendors that could furnish an AMI system. The proposal included supplying the meters and installing a fixed network antenna system throughout the City that is necessary for relaying data from the meters. A total of four competitive proposals were received, ranging from $9.4 million to $10.9 million. On December 8, 2016, an agreement was executed for the purchase of AMI meters and the installation of a fixed network system. An additional contractor for the installation of the AMI meters, encoders/registers, and radio endpoints/antennae at the meters will be procured under a separate competitive solicitation.

The AMI meter specifications are as follows:

Meter Size: ¾-inch through 2-inch cold water meters for residential connections. The meters shall be positive displacement type meters and shall be complete with incremental digital registers and automatic meter reading radio endpoints/antennae. Ultrasonic meters or meters that rely on a battery to measure flows are not permitted except for limited locations.

The selected AMI meters for sizes ¾ inch through 2" are the Neptune T-10 meter Nutating Disc type meter and alternate meters the Neptune Mach-10 Ultrasonic These meters exceed the latest C700 Standard. The Neptune nutating disc, positive displacement meter has been time-proven for accuracy and dependability since 1892. These meters consist of three major assemblies: an R900i register/MIU, a lead-free high copper alloy main case, and a nutating disc measuring chamber. This corrosion resistant, lead-free, high copper alloy main case can withstand almost every service condition; internal water pressure, rough handling, and inline piping stress. The innovative floating chamber design of the nutating disc measuring elements protects the chamber from frost damage, while the unique chamber seal extends the low-flow accuracy by sealing the chamber outlet port to the main case outlet port. The nutating disc measuring element utilizes corrosion resistant materials throughout and a thrust roller to minimize wear.

Meter Warranty: Neptune provides a limited warranty with respect to these meters for performance materials and workmanship; however, the main cases are warrantied for the life of the product.

The phase prior to the installation of the meters described included the installation of a fixed network signal transmission system. This stand-alone fixed network, complete with software and materials and equipment, has been completed; however, the description of the network equipment and features are included in this description to provide a

more complete technical understanding of the AMI system. This Network system interfaces with the City's existing billing system and new Meter Data Management (MDM) software and included a Propagation Study and Proof of Concept to verify that there will be no detrimental interferences with other radio transmissions, including but not limited to the City's SCADA system.

The Neptune AMI endpoint is a full 2-way radio which allows for daily time synchronization and over-the-air programming. The AMI endpoint sends a single transmission per day which includes an exact midnight read, hourly consumption data, leak/tamper information, and other endpoint diagnostics which arms City personnel with all the information they would ever need and want. The AMI endpoint has an auto-detect feature and does not need to be programmed during installation, regardless of which encoded register to which it is attached.

The Neptune R900 AMI Data Collectors {DC's) will be permanently mounted in strategic areas around the City's distribution system and can be AC powered or solar. These DC's in the field receive the transmissions directly from the AMI endpoints, as the Neptune system does not utilize repeaters which are a potential weakness in other fixed-network offerings. These DC's can transmit the information back to the host software via GPRS, Ethernet, and/or WiFi backhaul. The Contractor's RF Propagation team will use a propagation map that positions Neptune DC's at various points around the City with 100% of them utilizing a cellular backhaul to relay meter data to the host server. Fifteen (15) DC's will be used to ensure redundancy throughout the City and maximum read-rate success.

The Neptune R900 Software has been installed on a host server on the City's network. The DC's communicates with this software to populate the database with meter reading information being transmitted from the AMI endpoint radios in the field. This database is capable of storing millions of records and City personnel are able to access it via a user-friendly web interface from computers on the City's network. The host software is very user-friendly and can be customized by each user to generate reports specific to each of their needs. The AMI software assists Customer Support personnel in successfully resolving water usage disputes between Billing staff and City customers, by providing reports that pinpoint specific dates, times, and levels of consumption.

Neptune Radio Endpoint:

The E-Coder R900i combines the high-power, two-way radio frequency (RF) R900 meter interface unit (MIU) and the E-Coder solid state absolute encoder into one integrated package to provide easier installation, requires no field programming, and does not have an external wiring due to the integrated design. Designed to collect meter usage date and remotely transmit the information to collectors at pre-determined intervals, allowing for hour consumption profiling to help address consumption disputes, detect leaks, and reverse flow occurrences and notify Ventura Water of priority alarms via email or text message. The R900i also comes with a 20-year warranty.

R900 Data Collector (R900 DC)

This collector features two-way communications which allow for over-the-air programming, 24-hour usage/consumption profiling, and priority alarms for leak

detection, reverse flow, no flow, and other value-added features. As a tower-based system, the cell size is optimized, which allows for small number of collectors to confidently cover the system and provide maximum redundancy.

Highly secure RSA encryption over a proprietary communications protocol for all commands and data transfers affords enhanced protection. Furthermore, the firmware is coded with security to ensure unauthorized access is not allowed at any level. For data storage on collectors, AES encryption is used to ensure that even if access to the database is gained, sensitive information cannot be extracted from it.

A radio wave propagation study was completed in 2017 to identify the locations for the antennas that will make up the fixed network system using a spectrum analyzer to identify the best frequencies available for the City's AMI System will be used. The Contractor installed Gateway/Data Collectors at suitable locations chosen by the City for Proof of Concept and testing of the initial 100 AMI meters with a few of the antennas to verify the system for a period of up to I year.

After the verification period was completed, the next phase (Phase II) to procure and install of the remaining antennas and approximately 11,000 residential meter replacements. Residential meters quantities are approximated due to the fact that 400 homes were destroyed by the Thomas Fire and those homes are in various stages of reconstruction.

The installation of the Phase II AMI meters and the new meter lids is currently in progress and will be completed this summer of 2019. This proposal is for the next phase to replace 10,112 meters and for residential and small commercial customers.

1.4 Evaluation Criteria

The replacement of the existing water meters with automated meters will conserve water and improve overall water management.

1.4.1 Evaluation Criterion A: Quantifiable Water Savings

1) 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.

Table 2: Estimated Water Savings

Customer Type	Connections	Average Water Consumption (AFY)*	Estimated Water Savings (AFY)
Residential	8,441 – SFR	2781.78	194.72
	989 – MFR	325.955	22.82
Commercial	682	587.88	41.1516
Total	**10,112**	**3695.615**	258.6916

*Average water demand 2016-2018.

It is estimated that the replacement of the existing meters with automated meters for the proposed phase will conserve approximately 258.69 AFY. This calculation is based on an estimated savings of 7 percent of the averaged water demand for 2016 through 2018, which includes water restrictions due to an ongoing multi-year drought., This level of savings is less than the typical degree of water savings that has been repeatedly reported by other water utilities; however, the City staff considers this estimation is more accurate for our service area. When compared to a normal year which would have water demands equaling 22 percent greater that is being currently consumed, the water savings would likely meet or exceed the typical 10 percent water conservation experienced by other utilities.

While water demand has reduced in response to the recent 7-year drought in the Ventura County area, it is anticipated consumption will return to higher levels when restrictions are lifted if permanent systems are not implemented. In Phase II, approximately 11,000 single-family residential meters are being replaced currently; therefore, the number of residential meters has been reduced for this last phase scope of work. AMI is expected to yield a 7 percent savings from the 3-year averaged water demand of 3695.62 for customers (see Table 2). This savings will be

achieved by AMI meters rapidly detecting leaks that occur in homes that would otherwise remain undetected for months with current manually-read meters. Also, with the customer interface component of AMI, customers will gain greater awareness of their day-to-day (even hour to hour) water use, which will help them to find more ways to conserve.

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

Ventura Water's system losses are approximately 6.5 to 10 percent annually, based on the comparison of billing records versus production records since 2005. Using the California Department of Water Resources Water Audit Method for 2015, meter inaccuracies account for about one percent of the unaccounted water.[2] It is suspected that water losses are occurring at the existing customer meters in the form of under reporting water usage and leaks/losses that may be occurring at the meters due to mechanical defects/failures and/or tampering. The proposed project will help the City to reduce such water losses by providing more accurate usage data and reveal leaks sooner so they can be repaired quickly.

It is known that as meters age they under-report volumes, therefore it is reasonable to conclude that the City is also losing significant amounts of revenue.

3) **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. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.**

By switching from standard volumetric meters that do not have the ability for remote monitoring to the AMI System and MDMS, the new meters' ability to provide real-time, two-way communication electronically to both City Staff and customers will enable the City to mitigate water leaks and loses, educate consumers on how to reduce water usage and help control water use during water alerts and droughts, if necessary. The meters proposed for replacement under this phase are 12 years old or more and have reached the end of their useful life. These meters are known to under report water usage as they age, resulting in lost revenue and contribute to wasteful water use.

According to the Pacific Institute, when coupled with effective pricing structures, reductions of 15 to 20 percent in water can be achieved, with additional water savings possible through the improved management of the water system with respect to the identification and the repair of leaks that would likely go unnoticed for months with standard volumetric meters. For example, The City of Santa Maria reduced their waters losses from 6 percent to 2 percent after converting to an AMI system, and the City of Sacramento was able to detect and repair leaks that resulted in water savings of 236

[2] City of Ventura 2015 Urban Water Management Plan.

million gallons of water over a two-year period.[3] The City of Ventura already has a tiered pricing rate, however, the addition of the smart meters, the AMI network and the meter data management system, water conservation will likely increase due to the fact that the customer will be able to receive high usage alerts that will include the time of day this higher usage is occurring and will be better able to correct such issues. The City will also be able receive such alerts and will be able to provide the customer information regarding potential leaks and provide conservation tips.

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

   The proposed project does not include installing distribution main meters.

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

   10,112 Neptune T-10 Positive Displacement AMI meters, ranging in size from 3/4" to 2" for residential customers during this phase.

   These meters exceed the latest C700 Standard. The Neptune nutating disc, positive displacement meter has been time-proven for accuracy and dependability since 1892. These meters consist of three major assemblies: an R900i register/MIU, a lead-free high copper alloy main case, and a nutating disc measuring chamber. These meters will communicate with a fixed Radio Transmission System that will be implemented prior to the installation of the meters. This Network is comprised of:

   - Neptune E-Coder Registers
   - Neptune E-Coder R900i Integrated Register/Radio (Battery-less)
   - Neptune R900 Meter Interface Unit (MIU)
   - Neptune Fixed Base Field Service Tool
   - Neptune R900 Data Collector
   - Neptune R900 Mini Data Collector
   - Neptune N_Sight Plus Software

6) **How will actual water savings be verified upon completion of the project?** Currently, the water system is not able to detect water losses or other problems with end user meters. The city recently installed a new meter data management system in 2018 that will interface with the software with the billing system, however, the benefits of this system cannot be realized until the smart meters and fixed area network system has been installed. The new AMI system will provide real-time interval usage data on at least an hourly basis and the system

[3] "*Metering in California,*" Pacific Institute ,September 2014. http://pacinst.org/app/uploads/2014/09/pacinst-metering-in-california.pdf

will also send staff and water customers electronic alerts to identify and repair such problems. Furthermore, the accuracy of these new meters exceeds that of the existing meters due to their age and limited function. The software supporting the AMI system will provide data and compare it to previous years' consumption data to provide the actual water savings. Water use per connection will be compared pre- and post- project to determine actual water savings. Leaks detected and repaired will also be included in the actual water savings calculation.

The base calculation will use the averaged water demand values for users from Table 2 on Page 13. These amounts best reflect current conditions and estimated savings.

1.4.2 Evaluation Criterion B: Water Sustainability Benefits Expected to Result from the Project

- Is there a specific water supply sustainability concern in the region? Explain and provide detail of the specific issues in the areas that impacts water reliability. Will the project directly address a heightened competition for finite water supplies and over-allocation?

Yes, multi-year droughts occur in California and the most recent 7-year drought resulted in serious water supply sustainability concern as the region water utility districts worked to manage water demands versus environmental impacts and available supplies.

On January 17, 2014, California Governor Edmund G. Brown Jr. declared a State of Emergency and directed state officials to take all necessary actions to prepare for the drought conditions and called upon every Californian to conserve water. As water supplies continued to diminish, the Governor's office called on all water agencies to implement drought measures to reduce water demands and the Department of Water Resources reduced SWP allocations for southern California contractors to zero on January 31, 2014, and then 5% for 2014. Water resources remain very low throughout the entire State with DWR restricting SWP suppliers to 15-20 percent of their requested allotments until March 2017.

Unfortunately, the Ventura County Region continues to be at risk of not meeting drinking water demands as this region is 100 percent reliant upon local supplies and is still operating under drought conditions due to the lack of available imported water resources to the city. The water for 70,000 people in western Ventura County is at risk due to the persistent drought conditions. Water agencies that typically get all or part of their water from wells have had to start purchasing Lake Casitas water, as their wells have run dry; Ventura is also experiencing this issue. Since 2011 (first drought year), purchases of Lake Casitas water have increased by 1,000%. The lake is an important, but dwindling, resource threatened by both water supply and, subsequently, water quality concerns. For the first time since 1968, levels in Lake Casitas have dropped below 50% volume and currently remains there as of the date of this proposal.

Low water levels in 1968 resulted in significant thermal stratification and anoxic (without dissolved oxygen) conditions, rendering the lake generally unsuitable for aquatic life. The low oxygen levels also created an environment where manganese and hydrogen sulfide, normally trapped in sediments, became soluble, causing the lake water to have a brown color and bitter metallic taste. There were also large blue-green algae blooms.[4] Normally creek inflows provide supply and facilitate lake mixing (which helps maintain good water quality). During periods of drought, Inflows significantly decrease, causing the lake to stratify and stagnate. Data from Casitas Municipal Water District indicate that the lower parts of the lake become anoxic and the affected lake volume increases as droughts continue. The Casitas water treatment plant does not have sufficient coagulation or sediment treatment processes to address anoxic lake conditions, and widespread algae blooms may result in Casitas not meeting drinking water standards during extended periods of low precipitation.[5]

Ventura River Basin groundwater wells are almost exclusively recharged from Ventura River flow. The basin is relatively shallow and responds quickly to rainfall or lack thereof. During the most recent drought, the City of Ventura lost 70% of its normal Ventura River supply. Due to low water levels in the Ventura River Basin, the wells operated by Meiners Oaks Water District ran dry and they were entirely dependent on purchases of Lake Casitas water, and Ventura River County Water District only had one of its four wells in operation causing supplies to also be drawn from Lake Casitas.

Groundwater supplies curtailed in Southern Ventura County by Fox Canyon Groundwater Management Agency (GMA), which support agriculture, municipal, and industrial water use for a significant portion of the developed regions of Ventura County. [6] On April 11, 2014, the GMA adopted an emergency ordinance to prevent further seawater intrusion and to limit risk of subsidence. Groundwater from the Fox Canyon GMA area makes ups approximately 45% of supplies for the City of Ventura, as well as Oxnard, Port Hueneme, Camarillo, and Moorpark, and various adjacent unincorporated communities. Emergency Ordinance E effectively mandates reduced groundwater use; as of July 1, 2014, pumpers were to reduce extractions by 10% with required reductions increasing to 15% by January 1, 2015 and to 20% by July 1, 2015.[7]

During periods of curtailment, the City is not able to maximize its use of groundwater wells in the Fox Canyon/Oxnard Plain Basin, which is needed to help meet supplies and provide redundancy during periods of maintenance and/or repairs to other wells and to improve supply reliability.

Unlike most of southern California, the western portion of Ventura County does not receive any imported water from the State Water Project (SWP). 30 Percent of the

[4] Casitas Municipal Water District. 2011. 2010 Urban Water Management Plan.
[5] Casitas MWD. 2013. Lake Casitas Water Quality Study. Prepared by Flow Science, Inc.
[6] Fox Canyon GMA website. www.fcgma.org/about-fcgma . Accessed 1/20/15.
[7] Fox Canyon GMA. 2014. Emergency Ordinance E: *An Emergency Ordinance Limiting Extractions from Groundwater, Suspending Use of Credits and Prohibiting Construction of Any Groundwater Extraction Facility.*

City's water supply originates from Lake Casitas during typical hydrologic conditions; however, the lake is fed only by local runoff from the Los Padres Mountains. On September 22, 2014, the Ventura City Council declared a "Stage 3, Water Shortage Emergency" and implemented water waste prohibition that limits and reduces outdoor water use; restaurants are restricted from serving water to requests only; and enforcement actions for water wasting. The City also created a Water Shortage Task Force to provide community input as the City responds to the drought. The Task Force's primary goals were: 1) establish drought rates, 2) adopt a water shortage contingency plan, and 3) approve creation of a customer incentive program. A new customer incentive program was implemented in 2015, and funding from the USBR was also received at the end of 2015 under the WaterSMART Water and Energy Efficiency Grant program to help support this ongoing effort to increase water conservation and the City also received a grant from the California Department of Water Resources Integrated Regional Water Management Program to fund customer incentives for the City of Ventura, Casitas Municipal Water District, and the City of Santa Paula. As a result of the City's efforts, there was a 19 percent reduction in water use in 2015 from what was used in 2013. The Stage 3, Water Shortage Emergency ordinance is still in effect as of the writing of this application.

In January 2015, the lake level for Lake Casitas was 51.6%, according to the Casitas website. The 50% capacity level is a critical point at which the following additional water conservation measures will be automatically triggered:

- Establish a water allocation program based on historical uses of Casitas water or other fair and equitable bases, which will establish the amount of water that can be obtained by each customer, including other water agencies.
- Implement or adjust an increasing block rate structure for any classification of water service (i.e. impose a drought surcharge.)
- Require all water agencies taking water from Casitas to implement water conservation and restrictive water use measures.
- May direct the oil companies to cease taking any Casitas water for secondary oil recovery purposes or other non-life-sustaining purposes.
- May request the Ventura County Board of Supervisors and the cities of Ojai and Ventura to place a moratorium for all building permits, lot splits, or subdivisions within Casitas boundaries.

On January 16, 2017, the lake level was at 35.2 percent. As a result, those receiving water from Lake Casitas, including the City of Ventura, experienced a change in color and/or odor and taste of their drinking water. The color change is due to manganese levels increasing, and the taste and odor issues are related to algae blooms. As of the March 11, 2019, the lake level is at 42.5% despite recent heavy rainfalls.

The most significant impact caused by the drought for the City of Ventura water supply is to the groundwater. As discussed previously, the depletion of groundwater from the Ventura River groundwater basin and the pumping

restrictions of the GMA managed basin was a significant concern for maintaining water supplies. The proposed project will significantly benefit the City and improve the reliability for residents, businesses, and institutions.

Ventura County agricultural users receive 50,000 acre-feet of water annually from the groundwater managed by the GMA and are also required to comply with the Emergency Ordinance E mandated pumping reductions noted previously. Some agricultural users have been able to supplement with recycled water; however, the Ventura County Farm Bureau reports it is likely that famers will comply with pumping restrictions by having few crop rotations, and if dry conditions persist the risk of agricultural fallowing grows and there is an increasing potential for growers to permanently leave the region.

Depending on the outcome of groundwater safe yield study and if Casitas takes further action to reduce allocations, the City is considering a building moratorium; three other water districts that serve portions of Camarillo, Montecito and Altadena, and the City of Sierra Madre have already moratoriums in place—all Ventura County communities.

- **How will the proposed project help to address that concern? Will water conserved through the project result in reduced diversions or be made available to help alleviate water supply shortages due to drought, climate variation, or over-allocation?**

  Yes. By better managing the City's water data and improving efficiencies, an estimated 258.69 acre-feet of water will be saved. Conserving water, reducing water losses, and better management of water is the simplest method to lessen competition for finite water supplies in both the short term and for future demands as well.

  Please describe in detail where the conserved water will go and how the conserved water is expected to increase water sustainability. Consider the following:

  Decreased water use will result in an equal decrease in demands to water that would otherwise be taken from the Ventura River, Lake Casitas and/or from groundwater supplies, thus improving the sustainability of these water sources.

  The conserved water will be used to decrease water demand from the rivers, lakes and groundwater resources and will enhance the City's ability to meet demands during extended times of drought.

  The City's portfolio of water supplies includes water from Lake Casitas and from the Ventura River; these sources provide as much as 56 percent of the City's water supply. From year to year the amount of water received from the various sources may fluctuate due to a variety of factors including drought, however it is reasonable to expect that a reduction in water demand will also result in a

reduction of the need to draw water from these surface water supplies, which will result in an increase in instream flows. Considering an equal reduction in all water supplies commensurate with the current percentages in which the City is provided water, it is estimated that as much as 20 percent of the water saved may be conserved water for instream flows in the Ventura River, equaling an estimated 49 acre-feet per year. This is based on the fact that, on average, 20 percent of the City's water supply comes from the Ventura River.

Will the project make water available to achieve multiple benefits or to benefit multiple water users?

During normal hydrologic years, more than 50 percent of water supplies available to the City are sourced from the Ventura River Watershed (including water purchased from Casitas Municipal Water District (CMWD) from Reclamation's Ventura River Project.

The Ventura River watershed, the smallest of Ventura County's three major watersheds, covers an area of about 227 square miles (144,970 acres). All of this land drains into the Ventura River, either directly or through creeks and tributaries, each of which has its own smaller drainage area called a subwatershed. Major tributaries include Matilija Creek, North Fork Matilija Creek, San Antonio Creek, and Canada Larga. The Ventura River watershed, like the county's other major watersheds—Santa Clara River and Calleguas Creek—ultimately drains to the Pacific Ocean.

The Ventura River watershed is a remarkable watershed for several reasons. Unlike most watersheds in southern California, no imported water is used; residents rely 100 percent on local water supplies. Lake Casitas, fed by diverted Ventura River water and Coyote Creek, is the primary supplier of water from the watershed. The City of Ventura also diverts surface and subsurface water from the Ventura River in the Foster Park area. Groundwater, provided by individual wells or small water companies, is another important water source in the watershed, especially for farmers. Aquifers in the watershed tend to drain relatively quickly, but also recharge quickly with sufficient rain. However, due to extended periods of drought, the aquifers have not recharged causing the groundwater manager to restrict pumping and increasing reliance upon surface water (Lake Casitas and Ventura River water) and imported water sources.

The dramatic increase in reliance on Lake Casitas for water due to the climate variation (drought) is causing the lake to be depleted more quickly as more communities turn to this water source as their primary water supply.

The water from Lake Casitas is managed by the Casitas Municipal Water District (CMWD). The CMWD has the responsibility to manage this water supply and the rates of distribution to the water utilities and mutual water companies who rely upon it. Thus, the City works closely with the CMWD. The City also has access to groundwater resources, which allows the City to have some flexibility to adjust draws from surface water and use more groundwater to sustain supplies. However, the groundwater basins are also managed and pumping restrictions are currently in place due to the persistent drought conditions. Effectively, all of

the City's sources of water remain under restrictions, increasing the need for the City to implement water conservation measures that will have short-term and long-term benefits. Smart metering is such a solution.

Will the project benefit species?

The Ventura River is habitat for the southern California Steelhead, a federally-listed endangered species. According to the NOAA Fisheries, the steelhead populations within the Southern California Steelhead Distinct Population Segment have experienced declines of 90% or more in the Ventura watershed. The principle threat to the viability of this species is water facilities and diversions.[8]

The proposed project can help reduce the impact on the steelhead by improving water management and allow the City to utilize the Ventura River in a more environmentally sensitive manner.

It is estimated that the proposed project will conserve approximately 258.69 AFY; 56 percent of the City's water supply comes from Ventura River Watershed sources; therefore, the proposed project will improve water management of our River.

Furthermore, the City has the right to extract more water than it is currently using. Improving water management reduces the potential need to increase water draws.

The Santa Clara River is also a critical waterway for migrating steelhead, supports federally endangered southern California Steelhead. In addition, large numbers of the federally endangered tidewater goby inhabit the Estuary. Other fish found in the Estuary are arroyo chub, mosquitofish, green sunfish, California killifish, striped mullet, topsmelt, prickly sculpin, and fathead minnows (ENTRIX 1999; USFWS 1999). Downstream of Lake Casitas, the Ventura River and ecological resources are stressed due to low flows. The portion of the river downstream of the Highway 150 Bridge to Foster Park (reaches 3 and 4) has been listed by the US Environmental Protection Agency (EPA) as impaired due to water diversions and pumping.[9]

Historically, steelhead were abundant in coastal mountains of southern California, but now Southern California Steelhead are on the verge of extinction and have been federally-listed as an endangered species since 1987. The US EPA report on the Ventura River states:

> "*water quality problems related to eutrophication are compounded by low flow…Decreased summer flows and elevated nutrient concentrations in the Ventura River contribute to the excessive algal*

[8] Southern California Steelhead Recovery Plan. National Marine Fisheries Services, Southwest Regional Office Long Beach, CA, January 2012

[9] US Environmental Protection Agency. 2012. Ventura River Reaches 3 and 4 Total Maximum Daily Loads for Pumping and Water Diversion-Related Water Quality Impairments. December.

biomass growth, which in turn contributes to low DO conditions. Reducing nutrient loading, concurrent with maintaining or increasing existing river flow, are the most effective way to address eutrophication, which is the underlying cause of the impaired aquatic life beneficial uses in the Ventura River system...."

The low precipitation due to the recent multi-year drought has further stressed steelhead populations. As noted by the National Marine Fisheries Service as part of their recent surveys, "It is unlikely that any anadromous adults were able to travel beyond the Ventura River estuary due to low flow conditions and subsequent barriers to migration.[10] In the absence of substantial high flow events, vegetation has become well established in the floodplain.

Primrose and watercress were most abundant and formed dense cross-channel thickets that may have acted as further barriers to steelhead migration.

Low flows in the rivers clearly have a negative impact on the steelhead populations. By improving the efficiency and management of the City's water supplies, the City can avoid increasing its demands for water from the rivers and lakes and, during better hydrologic conditions, reduce the amount of water drawn from these resources; which would in turn play a role in improving the riparian habitat. Given the fact that multiple communities rely on these water sources for some percentage of their supply, this project serves as one of the pieces or steps towards improving the status of the southern California Steelhead.

Will the project make additional water available to Indian tribes, and/or rural or economically disadvantaged communities)? If so, please explain.

The City of Ventura does not directly provide water to rural or economically disadvantaged communities; however, there are portions of the city whose residents do meet the definition of economically disadvantaged. Furthermore, multiple small, private mutual water companies also rely on the water from Lake Casitas and the Ventura and Santa Clara Rivers. Ventura's efforts to reduce water consumption reduces the impact on the regional water supplies and as a result will likely benefit economically disadvantaged and rural communities served by these mutual water companies.

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

The proposed project is limited to the Ventura Water service area, therefore, there has not been any collaboration with outside entities or groups.

The City began outreach to the community through Water Commission meetings and City Council meetings in 2015 and conducts public outreach to educate

[10] Sam Bankston, Heidi Block and Chris Lima of the Pacific States Marine Fisheries Commission and California Department of Fish and Wildlife. 2014. Ventura River Watershed Spawner Surveys 2013.

customers about the benefits associated with automated meters and to respond to any concerns raised by the public.

To that end, some questions have been raised by the public following the City Council meeting to execute an agreement with the meter supplier. These concerns were focused on security concerns raised surrounding cyber hacking. Ventura Water staff has created a FAQ website link https://www.cityofventura.ca.gov/1111/Smart-Meters to address questions associated with AMI and trained customer service representatives responding to customer calls.

Is there widespread support for the project?

There is no opposition to the project. Support from outside agencies has not been pursued.

What is the significance of the collaboration/support?

It is important the customers understand the benefits and how safe and secure these meters and the associated network system are; therefore, the City held public meetings, included information in the Pipeline Newsletter that is provided via email, bill inserts, and notifications on the City's website and by direct response to customer questions.

Will the project help to prevent a water-related crisis or conflict?

The City of Ventura is one of many water suppliers that relies on the water supplies of the Ventura River, Lake Casitas, and groundwater basins to meet demands. The City of Ventura is one of the larger water suppliers; therefore, water savings achieved significantly benefits all who rely on the watershed for their water source.

Is there frequently tension or litigation over water in the basin?

Tension associated with the Ventura River water supply and the protection of the endangered species (e.g. steelhead trout) has led the Santa Barbara Channelkeepers to file a lawsuit to compel the California State Water Board to analyze the City of Ventura's use of the river. This is an ongoing case focused on reducing the amount of water the City of Ventura can withdrawal and/or restrict the timing of withdrawal to certain seasons.

The installation of water meters is not impacted by this litigation. Furthermore, if such restrictions to this water supply were to be enacted, it will be even more important that the city implement water conservation measures such as the proposed project since the City uses between 2,000 to 4,200 AF of water from this River annually.

Will water conserved through the project help to address water supply sustainability in a way not described above?

In 1999, the City became a signatory to the SWP Monterey Amendment Settlement Agreement, which allows the City and other SWP contractors to sell surplus allocated water back to the SWP pool of supplies. The Monterey Amendment Settlement

Agreement to the SWP contracts in 1999 provided the City a formal mechanism to allow it to place its annual SWP water allocation into a "turn back" pool to the California Department of Water Resources (DWR) for purchase by other SWP contractors.

The City of Ventura, United Water Conservation District (United) and Casitas Municipal Water District (Casitas) together hold a 20,000 acre-foot Ventura County water entitlement to the State Water Project, while the City has the greatest share at 10,000 acre-feet of the total County entitlement. The City pays approximately $1,000,000 annually to the SWP for bond, operating and capital costs in order to maintain its entitlement, per the terms of the 75-year SWP contract. The City has taken part in the "turn back" pool over the past several years as well as entering into direct sale agreements of the City's entitlement to United, Casitas, and/or other parties, which has allowed the City to recoup a small part of its annual SWP payment obligation. These are limited to one or two-year terms, with the City re-evaluating water demands and supply annually to determine if and how much of the City's water entitlement will be sold or turned back to DWR.

For example, in 2013, the City entered into an agreement with United to purchase 1,890 AF of Ventura's 2013 water allocation by having the water released from Pyramid Lake into Piru Creek to flow into Lake Piru. This allowed United to extend its fall conservation release, thus bringing water to the Oxnard Plan groundwater basin for recharge purposes. This agreement expired in December of 2014.

The City will continue to make these agreements, as due to a lack of infrastructure to access the City's full SWP entitlement, while continuing to reduce water waste through better water management and conservation.

This project will improve the management of the City's water demand for all customers as the final phase of the AMI implementation. It will allow the City to quickly identify real-time leaks and alert customers, reducing water waste. It will also allow the city to transfer accounts faster and to implement water restrictions/shut-offs for non-payment and/or water waste during emergencies and droughts. The improved water management value is limited to this scope of work, although all of the City's customer connections will be better managed overall.

Improved Water Management: **3,695.62** AFY

Additionally, implementation of this water conservation will save energy through a reduction in the distribution and treatment of water.

The estimated energy savings for the proposed project is:

- 168,665.88 kWh per year for system savings attributed to avoided pumping, treatment, and distribution.

- 119 Metric Tons reduction in carbon dioxide (Greenhouse gas reduction)[11]

According to the U.S. Department of Energy, the average energy use for water treatment drawn from southern California is 652 kWh per acre-foot. Therefore, if the City were to conserve 258.69 AF/Y due to the implementation of this phase to replace 10,112 meters, the City would save 168,665.88 kWh of energy.[12]

The greenhouse gas emissions reductions associated with electricity saved was calculated using the US EPA Greenhouse Gas Equivalencies Calculator website. This calculator uses the Emissions & Generation Resource Integrated Database (eGRID) U.S. annual non-baseload CO_2 output emission rate to convert reductions of kilowatt-hours into avoided units of carbon dioxide emissions. This calculation does not include any greenhouse gases other than CO_2. The formula for the emission factor is: 7.03×10^{-4} metric tons CO_2/kWh.

The project also results in reduced vehicle miles driven, in turn reducing additional carbon emission through the implementation of remote meter reading.

The City has 700 lane miles. By implementing this project, the number of lane miles driven monthly will be reduced 50 percent (50% represents the final phase implementation scope). By driving 350 less miles, it is assumed 15 gallons of gasoline will be saved resulting in a reduction in CO_2 equivalent of 133 kg.

> This estimated was calculated using the US EPA Greenhouse Gas Equivalencies Calculator website. The calculation is based on the number of grams of CO_2 emitted per gallon gasoline combusted, the heat content of the fuel per gallon is multiplied by the kg CO_2 per heat content of the fuel. The joint EPA/Department of Transportation rulemaking on May 7, 2010 established the initial National Program fuel economy standards for model years 2012-2016 using a common conversion factor of 8,887 grams of CO_2 emissions per gallon of gasoline consumed (U.S. EPA).

1.4.3 Evaluation Criterion C: Implementing Hydropower

Renewable energy is not included in the scope of this project.

1.4.4 Evaluation Criterion D: Complementing On-Farm Irrigation Improvements

The proposed project will not include any future on-farm irrigation improvements.

[11] U.S. EPA Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

[12] Dr. Allan R. Hoffman, The Connection: Water Supply and Energy Reserves. U.S. Department of Energy. http://waterindustry.org/Water-Facts/world-water-6.htm . Accessed 1/16/2017 & 3/11/2019.

1.4.5 Evaluation Criterion E: Department of the Interior Priorities

Subcriterion E.1: Creating a conservation stewardship legacy second only to Teddy Roosevelt.

a) *Utilize science to identify best practices to manage land and water resource and adapt to changes in the environment.*

AMI is an example of best practices to manage water resources and adapt to changes in the environment.

The Colorado River Basin (Basin) Water Supply and Demand Study confirms that without future actions, the Basin faces a range of potential future imbalances between supply and demand. One of the primary adaptation strategies identified in this study included water use efficiency and reuse. This project would help increase water use efficiency of potable water.

From January 2014 through April 2017, California experienced one of the most severe droughts in its history. California Governor Brown declared a drought State of Emergency in January 2014 and called for 20 percent conservation. California has experienced dry years and droughts from 2007 to 2011 and from 2013 to the 2017, and this has placed an immense strain on water supplies resulting in some of the lowest water storage levels in history. Completion of the implementation of the AMI installations will provide a significant increase in water use efficiency, reducing impacts on regional resources during times of normal and drought cycles. The AMI system will allow the City to issue email notifications to customers concerning conservation, water use, water leaks, and permit the City to remotely read meters. Remote meter reading reduces greenhouse gases by eliminating the generation of reduce CO2 emissions by 133 kg annually by reducing vehicle miles driven throughout the city.

Additionally, the AMI Implementation Program will directly contribute to building drought resiliency by implementing a high caliber water management strategy that emphasizes water reliability, conservation, and increase water use efficiency.

Subcriterion E.2: Utilizing our Natural Resources

a) *Ensure American Energy Is Available to Meet Our Security and Economic Needs*

Water conservation saves energy by avoiding water treatment, deliver, and wastewater treatment. Implementation of this project save 168,665.88 kWh in energy. Reducing energy demands, especially during the summer months is a significant benefit to support the endurance of American energy available to meet security and economic needs.

Subcriterion E.5: Modernizing our infrastructure

b. The project facilitates private sector efforts to construct infrastructure projects serving American needs. The WaterSMART grant funds will allow the City to fast track the implementation of the final phase to complete the installation of AMI radios on 10,112 meters. In order to complete the work within 36 months, the City will utilize contractor labor for the installation, supporting jobs in the private construction sector.

c. This project supports Reclamation's objective to prioritize construction of infrastructure.

1.4.6 Evaluation Criterion F: Implementation and Results

Subcriterion No. F.1: Project Planning

Provide the following information regarding project planning:

1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, or other planning efforts done to determine the priority of this project in relation to other potential projects.

   The City of Ventura's 2015 Urban Water Management Plan (UWMP) provides the framework to help guide Ventura's water supply management and conservation actions for the future. Ventura is a member of the California Urban Water Conservation Council (CUWCC), and as a result has committed to implementing the CUWCC's Best Management Practices as outlined in the 2008 Memorandum of Understanding (MOU). As an urban water supplier Ventura Water is also required to meet the State of California's water conservation requirements as outlined in Senate Bill 7 of Special Extended Session 7 (SBx7-7), a bill targeting a 20 percent reduction in urban water use by year 2020. Ventura's 2010 UWMP demonstrates that the City has effectively already met its CUWCC and SBx7-7 targets, and in 2015 increased water conservation past these targets.

   The proposed scope of work is included under the City's 7-year Capital Improvement Plan as a high priority project to improve water management and support water conservation policies.

2) 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(s).

In addition to Ventura's UWMP, this proposed project supports regional water use efficiency goals included in the 2006 Ventura County Integrated Regional Water Management Plan (IRWMP). The first objective included in the IRWMP is to reduce

dependence on imported water and protect, conserve and augment water supplies. The proposed project is projected to conserve 258.69 AF of water within the Ventura County IRWMP region.

Subcriterion No. F.2: Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved). For more information calculating performance measure, see Section

The City will use the following performance measures to evaluate the performance of the AMI meter conversion project:

1) **Amount of Water Conserved**: This will be measured by comparing water usage reports for the AMI service area pre- and post- installation, as well as compare to those that do not yet have AMI meters installed. This will allow the City to evaluate the actual amount of the acre-feet per year saved as directly correlated with the AMI installation. This data will be provided by the meter data management system.

2) **Amount of water losses mitigated/unaccounted for water recuperated**. Water usage reports as well as review of water bills for the AMI project service area will be used to ascertain the reduction in water losses and unaccounted for water that has been recuperated.

3) **Energy Saving**s: Energy savings will be determined based using a formula of 652 kWh/1 AF of water conserved.

Parameters for determining water conservation will also take into account temperature/weather data, examine usage patterns (i.e. weekday, weekend, holidays, time of day).

Subcriterion No. F.3: Readiness to Proceed

a) **Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones and dates.**

Milestone / Task / Activity	Planned Start Date	Planned Completion Date
Reclamation Environmental Compliance	10/1/2019	11/1/2019
Purchase and Installation AMI meters – 50% complete	11/15/2019	5/31/2020
Purchase and Installation AMI meters – 100% complete	6/1/2020	11/30/2020
Water Conservation Analysis Period	12/1/2021	5/31/2021

b) Describe any permits that will be required, along with the process for obtaining such permits.

No permits or approvals are required for the proposed project.

c) Identify and describe any engineering or design work performed specifically in support of the proposed project.

Project Specific Planning Work: Over the past several years the City of Ventura has trialed approximately 2,000 AMR and AMI meters. Through this trialing of different devices the City staff learned what features were preferred as well as the cons of some devices (i.e. avoid plastic devices). The City staff also learned that many locations have size constraints that led to very specific sizes being incorporated into the City's RFP. This experience allowed the staff to prepare very clear and detailed specifications for the types of meters and AMI infrastructure to be implemented.

The City's consultant also completed propagation study in 2017 to determine the best locations for the installation of the fixed area network infrastructure and also completed a proof of concept installation of 100 meters of varying sizes and evaluated their use for a period of 6 months. After the proof of concept period, the remainder of the fixed area network was installed and the purchase of the meters and associated supplies and installation of the meters for Phase II began for installation of residential and small commercial properties equating to approximately 50% of residential customers.

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

As the final phase of the project, no additional administrative actions or new policies are required for the proposed scope of work.

1.4.7 Evaluation Criterion G: Nexus to Reclamation Project Activities

Is the proposed project connected to Reclamation project activities?

One of the major facilities of Reclamation's Ventura River Project is the Robles Diversion. In 2003, Reclamation authorized CMWD to construct a fish passage facility. The facility is in operation, but the CMWD biological opinion rules limit when diversion can take place. No diversions are allowed unless fish flows exceed 30 cubic feet per second. In 2005 the Ventura River and Ventura River Estuary were designated critical habitat for southern California Steelhead.

In 2005 CMWD sued the federal government, claiming that restrictions to protect the steelhead limited their water rights. In early 2012, National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) released a Recovery Plan for the southern California steelhead (*Oncorhychus mykiss*). The Recovery Plan cites the need to:

- Improve stream flows
- Reduce diversions
- Remove physical impairments to fish passage
- Limit alterations to floodplains
- Limit sedimentation
- Limit urban and rural waste discharge to streams
- Repair and enhance estuarine habitat

Does the applicant receive Reclamation Project water?

more than 30 percent of Ventura water supplies come from Casitas Reservoir. Casitas Reservoir is a part of Reclamation's Ventura River Project. Water savings in the City of Ventura service area will result in reduced demand for Ventura River Project Water.

Ventura receives 5,000 to 8,000 AFY of water from Lake Casitas formed under the Reclamation's Ventura River Project. Additionally, United Water Conservation District has been supplementing the water supplies provided by their agency with water from the lower Colorado River via a connection to the Los Angeles Department of Water and Power since 2014.

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

No, the project is not located on Reclamation project lands and does not involve any Reclamation facilities.

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

The proposed project is in the same basin as Reclamation's Ventura River Project.

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

The proposed project will reduce demands for water in the Ventura River Basin. Some of the conservation savings will be realized as reduced demands on Ventura River Project water ultimately resulting in water savings within the Lake Casitas Reservoir.

Will the project help Reclamation meet trust responsibilities to Tribes?

The City of Ventura staff is not aware of any Tribes that would benefit from this project.

1.4.8 Evaluation Criterion H: Additional Non-Federal Funding

$$\frac{\text{Non-Federal Funding}}{\text{Total Project Cost}} = \frac{\$300,000}{\$2,342,510}$$

Non-Federal Funding = 87.15%

The following table depicts the percentages of the total project cost attributed to the various funding sources.

Table H -1: Funding Sources and Percentages of Total Project Cost

Funding Sources	Percent of Total Project Cost	Total Cost by Source
Recipient Funding	87.15%	$2,041,510
Reclamation Funding	12.81%	$300,000
Other Federal Funding	0%	$0.00
Totals	**100%**	**$2,342,510**

Section 2: Project Budget

2.1 Funding Plan and Letters of Commitment

All non-Reclamation funds will be provided by the City of Ventura. These funds will consist of monetary contributions from water revenues and/or municipal bond sales.

No other federal or state funds have been requested or received to complete the proposed project to date.

The funds requested from Reclamation will allow the City of Ventura to implement Phase III, the final phase of the City's AMI Conversion Project to better manage the city's water. The proposed improvements will replace the remaining residential, commercial, and industrial meters that are inefficient by today's standards, and are likely under reporting water usage and cannot alert staff and customers of leakages. This project, if funded, will improve water efficiency and water management, reduce energy use and energy costs, and save an estimated 258 AFY.

The City does not anticipate incurring any project costs prior to the anticipated start date for the installation of the meters.

Cost Share: Ventura Water is proposing to provide an 87% cost share for the proposed project.

Budget Table 1: Summary of non-Federal and Federal sources

Funding Sources	Funding Amount
Non-Federal Entities: Ventura Water (City of Ventura)	$2,041,510
Non-Federal Entities Subtotal	**$2,041,510**
Other Federal Entities:	0
Requested Reclamation Funding	$ 300,000
Total Project Funding:	**$2,342,510**

2.2 Budget Proposal

Budget Item Description	COMPUTATION		Quantity Type (hours/days)	TOTAL COST
	$/Unit	Quantity		
Salaries And Wages				
Not Applicable	0			**$0.00**
Fringe Benefits				
Not Applicable	0			**$0.00**
Travel				
Not Applicable	0			**$0.00**
Equipment				
Not Applicable	0			**$0.00**
Supplies/Materials				
Neptune T-10 Positive Displacement ¾-inch meters w/ components	$202.50	2,386	EA	$483,165.00
Neptune Mach-10 Ultrasonic ¾-inch alternate meters w/ components	$272.00	167	EA	$45,424.00
Neptune T-10 ¾"inch short	$202.50	5,172	EA	$1,047,330.00
Neptune Mach-10 ¾"inch short alternate meter	$272.00	333	EA	$90,576.00
Neptune T-10 1-inch meter with components	$260.00	1,378	EA	$358,280.00
Neptune Mach-10 1" alternative	$285.00	167	EA	$47,595.00
Neptune T-10 1 ½- inch meters with components	$445.00	144	EA	$64,080.00
Neptune Mach-10 1 ½-inch alternative	$545.00	133	EA	$72,485.00
2-inch meters with components	$570.00	165	EA	$94,050.00
Neptune Mach-10 2-inch alternate	$575.00	67	EA	$38,525.00
Total Supplies/Materials		**10,112**		**$2,341,510.00**
Contractual/Construction				
Not Applicable	0			**$0.00**
Subtotal				**$2,341,510.00**
Other				
Reclamation Environmental Review	1,000	1	LS	1,000
Total Direct Costs				**$2,342,510**

2.3 Budget Narrative

The budget table is divided into the following categories and sub-categories described in detail in this section:

Salaries and Wages

Not included in this project's budget.

Fringe Benefits

Not included in this project's budget.

Travel

Not included in this project's budget.

Equipment

No Equipment costs.

Materials and Supplies

Neptune T-10 and Mach-10 alternate meters will be purchased to replace the existing water meters sizes ¾" through 2". The supplier's cost proposal and agreement for the meters, and the specification sheet is provided under Appendix A. This agreement is for the meter costs for the meter replacement ¾" through 2", for the fixed area network, and for the propagation study and proof of concept. Only those costs associated with the scope of work to replace 10,112 meters ranging in size from ¾" to 2" and the meter components proposed for this project are relevant to this budget.

Contractual

Not applicable

Environmental and Regulatory Compliance Costs

Costs under this category are limited to costs incurred by Reclamation to determine the level of environmental compliance required for the project.

The proposed scope of work qualifies for a categorical exemption. A Notice of Exemption was filed in December 2016.

Other

No other costs are expected or included in the proposed budget.

Indirect Costs

No indirect costs are included in the budget.

Total Costs

Funding Sources	Funding Amount
Non-Federal Entities: Ventura Water (City of Ventura)	$2,042,510
Non-Federal Entities Subtotal	$2,042,510
Other Federal Entities:	0
Requested Reclamation Funding	$300,000
Total Project Funding:	$2,342,510

Section 3: Environmental Compliance

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 proposed project involves replacement of an existing water meters with automated meter devices and a fixed network infrastructure. The equipment for the network system will be installed on existing city street poles. Transmitters will provide two-way communication between the water meters and the AMI software system located at the City's offices.

   Under the National Environmental Policy Act "maintenance, rehabilitation, and replacement of existing facilities which may involve a minor change in size, location and/or operation", such as that which would occur under the proposed project, qualify for a Categorical Exclusion. Similarly, the project is exempt from the California Environmental Quality Act (CEQA). Under section 15301(b), Existing Facilities of the CEQA Guidelines "... minor alterations of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination..." are exempt from CEQA. The types of "existing facilities" which fall under this Class 1 exemption as noted under subpart b, "Existing facilities both investor and publicly-owned utilities used to provide electric power, natural gas, sewerage, or other public utility services."

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?

   The southern California Steelhead has critical habitat designated for the Ventura and Santa Clara River Watersheds. However, the proposed project is not likely to adversely affect the steelhead or any other species listed under the Federal Endangered Species Act. All of the proposed work will occur on existing water utility infrastructure. In fact, completing the proposed improvements may benefit these two watersheds and this endangered species by potentially reducing the City's water extractions.

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

   Yes, there are surface waters and wetlands located inside the project boundaries that potentially fall under CWA jurisdiction as "waters of the United States". The Ventura River, Ventura River Estuary and the Santa Clara River Estuary are within the project boundaries.
   The proposed activities will not impact any of these waters, as the improvements are limited to the retrofit of water meter infrastructure to improve efficiency and does not

include an expansion or destruction of infrastructure and will not result in an increased draw from or discharge to these waters.

4. When was the water delivery system constructed?

   The Spanish Fathers for the Mission San Buenaventura developed the first water system for the City. It consisted of an aqueduct (that is now abandoned) to convey water from the Ventura River, near San Antonio Creek, to a reservoir located behind the Mission. During subsequent development around the Mission, additional groundwater was obtained from wells in the Ventura and Santa Clara River basins. Water facilities were developed and operated for the City by several individuals and companies over the period of 1869 to 1923. In 1923, the City acquired the water system, along with its water rights from the Ventura River, from the Southern California Edison Company and assumed the responsibility of providing water to City residents. In years following, the City developed additional sources of surface and groundwater, including wells and improvements to the surface water diversion from the Ventura River. Also, since 1960, the City has purchased surface water from Casitas Municipal Water District to supplement its water supplies. As development occurs on the east side of the City, additional groundwater facilities have been completed to meet increasing demands.

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

   No modifications are being made to an irrigation system.

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

   No buildings, structures, or features associated with the proposed project are listed or eligible for listing on the National Register of Historic Places.

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

   There are no known archeological sites that would be affected by the proposed project. The proposed project will replace existing meters on infrastructure that has been in operation for 20 years or more and will not include any new ground disturbing activities.

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

   The proposed project will have no impact on low or minority populations. The proposed improvements are intended to improve system efficiencies and reduce water losses.

The project could actually benefit all populations, with the greatest benefit to low/fixed income or minority populations, by improving water management and reducing losses, which reduces the need for the City to seek more expensive imported water supplies and increase water rates.

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

   The proposed project will not limit access to or ceremonial use of Indian sacred sites or result in other impacts on tribal lands as the infrastructure to be improved are not located within such areas.

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?

    No, the conversion of the existing meters to automated meters will not contribute to the introduction, continued existence, or spread of, noxious weeds or non-native invasive species.

Section 4: Permits and Approvals

No additional permits or approvals are required to implement this project scope.

Section 5: Official Resolution

The Ventura City Council will approve a resolution on April 8, 2019 authorizing the general manager to submit a grant application to and execute a Cooperative Agreement with Reclamation for implementation of the proposed project. The resolution agrees to use the funds identified in this funding plan for the proposed project. The official resolution will be forwarded to the USBR under separate cover within 30 days of the grant application deadline.

Section 6: References

City of Ventura, Ventura Water. *2015 Urban Water Management Plan.*

City of San Buenaventura, March 2011. Water Master Plan.

Watersheds Coalition of Ventura County. 2006. *Integrated Regional Water Management Plan.*
http://portal.countyofventura.org/portal/page/portal/ceo/divisions/ira/WC/Library/IRWMP_Document

Southern California Steelhead Recovery Plan Summary, NOAA's National Marin Fisheries Services Southwest Regional Office. , accessed 1/18/14
http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/south_central_southern_california/southern_california_steelhead_recovery_plan_executive_summary_012712.pdf

APPENDIX A

Meter Supplier Cost Proposal

EXHIBIT A-2
STANDARD FORM GENERAL SERVICE AGREEMENT
(City of San Buenaventura and Ferguson Enterprises, Inc.)

PROPOSAL BY CONTRACTOR

CITY OF SAN BUENAVENTURA SPECIFICATION NO. P-130000272B
ADVANCED METERING INFRASTRUCTURE (AMI)

The following items in the Proposal shall be considered incorporated/not-incorporated into the Scope of Services:

1. By execution of this Agreement, City acknowledges and accepts the Exceptions made and listed on pages 25 and 26 of 79 of the Proposal. Revised insurance requirements are provided in Exhibit C.

2. The schedule on page 27 of 79 shall be superseded by the schedule in Exhibit A-1.

3. The City will not be participating in the HomeServe USA Program under this Agreement as described beginning on page 31 of 79 of the Proposal. The City is considering participation under a separate agreement or via a Change Order to this Agreement at a later date.

4. Contractor shall provide the products/items listed on page 34 of 79 of the Proposal, unless substitute products/items are mutually agreed upon between both Parties that are in the best interest of the City and at the same or most advantageous price to the City. All items listed with "R450" or "R450i", shall be replaced with "R900" or "R900i V4". All R450 system equipment shall be substituted with R900 equipment at no additional cost to the City. An R450 licensed frequency system may be utilized if it is determined that there will be unacceptable signal interferences with the R900 system, as determined by the City.

5. The City is exercising the option to pursue the R900 system at no additional cost upon the condition that the R900 system is deemed acceptable to the City upon conclusion of the Propagation Study during Phase 1 and Proof of Concept in Phase 2.

CITY OF SAN BUENAVENTURA SPECIFICATION NO. 15-001

ADVANCED METERING INFRASTRUCTURE (AMI) PRICE SCHEDULE

Item No.	Description	Quantity	Unit Price (US$)	Extension (US$)
1	¾-inch Short Meters with Meter Components	7,158 ea.	$202.50	$1,449,495
1a	¾"-inch Short Alternate**	500 ea.	$272.00	$136,000
2	¾-inch Meters with Meter Components	15,517 ea.	$202.50	$3,142,192.50
2a	¾"-inch Alternate**	1,000 ea.	$272.00	$272,000
3	1-inch Meters with Meter Components	4,134 ea.	$260.00	$1,074,840
3a	1-inch Alternate**	500 ea.	$285.00	$142,500
4	1-1/2 inch Meters with Meter Components	431 ea.	$445.00	$191,795
4a	1-1/2-inch Alternate**	400 ea.	$545.00	$218,000
5	2-inch Meters with Meter Components	494 ea.	$570.00	$281,580
5a	2-inch Alternate**	200 ea.	$575.00	$115,000
6	3-inch Meters with Meter Components	109 ea.	$610.00	$66,490
7	4-inch Meters with Meter Components	367 ea.	$890.00	$326,630
8	6-inch Meters with Meter Components	322 ea.	$1,500.00	$483,000
9	8-inch Meters with Meter Components	122 ea.	$1,890.00	$230,580
10	10-inch Meters with Meter Components	17 ea.	$3,110.00	$52,870
11	10 Years Technical Support of AMI System (not including MDM Software)	LS		$25,000
12	Fixed Network Installation	LS		$379,500
13	10-Year Maintenance of Fixed Network	LS		$162,500
			Sub-Total w/o Tax	$8,749,972.50
			7.5% Tax on applicable items	$636,935.44
			Total with Tax	$9,386,907.94
	HomeServe USA Participation Discount**	31,000 ea.	$8.00	($248,000.00)
			Grand Total with Tax and Discount	$9,138,907.94

Name of Vendor: Ferguson Enterprises, Inc. dba Equarius Waterworks proposing Neptune

***See HomeServe USA Program on the following pages

FERGUSON Waterworks

Meter & Automation Group

EQUARIUS waterworks

A FERGUSON ENTERPRISE

Manufacturer Catalogue Information (Summary Sheet)

The product specification sheets for each item to be furnished to the City immediately follow this summary sheet. All items are in compliance with the Specifications and are covered in the Price Schedule.

1. Neptune T-10 Positive Displacement Meters (Sized 5/8" – 1")
2. Neptune T-10 Positive Displacement Meters (Sized 1 ½" – 2")
3. Neptune Mach10 Ultrasonic Meters (5/8" – 1")
4. Neptune Mach10 Ultrasonic Meters (1.5" – 2")
5. Neptune HP Turbine Meters (Sized 1 ½" – 10")
6. Neptune E-Coder Register (All Sizes)
7. Neptune E-Coder R450i Integrated Register/Radio (Battery-less Register All Sizes)
8. Neptune R450 Meter Interface Unit (MIU)
9. Neptune Fixed Base Field Service Tool
10. Neptune R450 Data Collector
11. Neptune R450 Mini Data Collector
12. Neptune N_Sight PLUS Software
13. Neptune T-10, HP Turbine, Tru/Flo Compound Meter Warranty Statement
14. Neptune Mach10 Ultrasonic Meter Warranty Statement
15. Neptune ProRead / E-Coder Warranty Statement
16. Neptune E-Coder R450i Warranty Statement
17. Neptune R450 MIU Warranty Statement
18. Neptune R450 Data Collector Warranty Statement
19. Neptune R450 Mini Data Collector Warranty Statement
20. Neptune N_Sight Software Statement