APPLICATION

WaterSMART

Water and Energy Efficiency Grants for Fiscal Year 2023

NOFO No. R23AS00008

WaterSMART

Water Efficiency Project: Western Meter Replacement Phase 3 and District Metered Area Implementation Project

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Table of Contents

1. Technical Proposal and Evaluation Criteria

1.1. Executive Summary

Date:	July 28, 2022
Applicant Name:	Western Municipal Water District
Applicant City, County, State:	Riverside, Riverside County, California
Applicant Type:	Category A
Project Title:	Water Efficiency Project: Western Meter Replacement Phase 3 and District Metered Area Implementation Project (Project)

Western Municipal Water District (Western), located in southern California, will install 1,835 advanced metering infrastructure meters, and implement Western's District Metered Areas Implementation Plan improvements. With the implementation of this project, Western's entire retail service area would have advanced metering infrastructure (AMI) meters and access to Western's Customer Portal. In addition, the project will purchase and install 2 distribution meters identified in Western's District Metered Area (DMA) Implementation plan. The WaterSMART: Water and Energy Efficiency grant program is looking to fund projects that result in quantifiable water savings and projects that support broader water reliability benefits. The anticipated total annual project water savings are estimated at 800 Acre-Feet per Year (AFY), with a total lifetime savings of 12,000 AF. This 800 AFY of water saved will reduce reliance on imported water, promote water sustainability, and address water loss tying directly into greater water reliability for Western Municipal Water District.

The Project will begin May 2023 and be completed within 2 years.

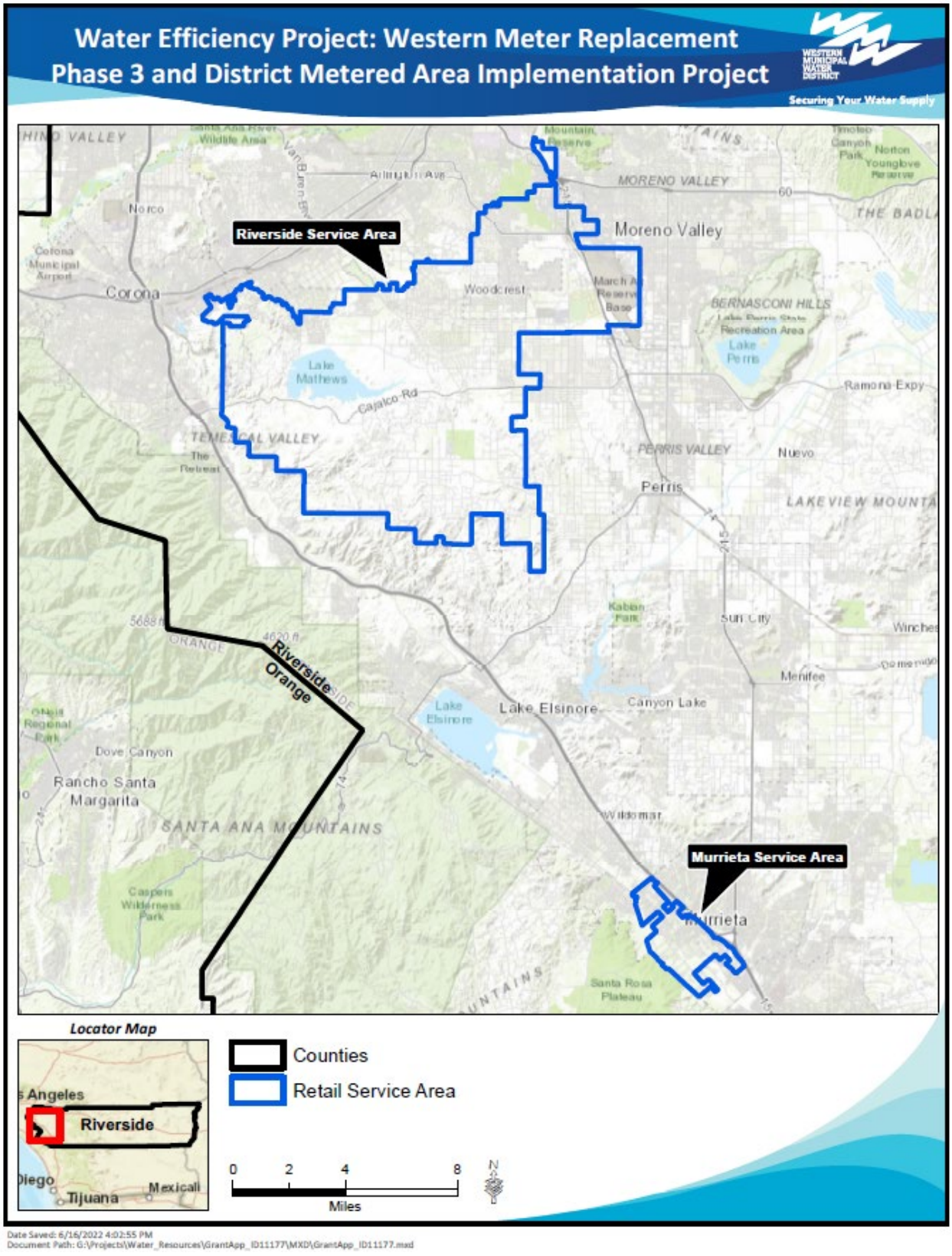
No Federal property will be affected by this project.

1.2. Project Location

Western's Water Efficiency Project: Western Meter Replacement Phase 3 and District Metered Area Implementation Project (Project) is located in Riverside County, California, approximately 100 miles North of San Diego, approximately 75 miles east of the Pacific Ocean, and approximately 180 miles west of the Arizona border. The center of the service area was selected in the middle of the 104 square mile area in Western's Retail Service Area with a latitude of 33.858 and a longitude of -117.359.

Figure 1, a map of Western's Retail Service Area, is shown below.

Figure 1. Project Location



1.3. Technical Project Description

The 1,835 advanced metering infrastructure (AMI) meters being installed in this project will bring 100% of Western's Service Area to AMI. Table 1 shows the quantity of AMI Phase 3 Meters to be purchased and installed by meter size and meter type. Additional equipment required to be purchased and installed are meter lids and bolts for meters larger than 1.5 inches. Both the new meters and retrofitted meters will be able to automatically transmit data using an existing data collection network, thereby eliminating the need for manual, on-site or drive-by meter reading along the targeted routes. Neptune is the meter manufacturer and their meters using the Long Range (LoRa) transmission protocol will be used for this Project. Neptune also provides the data collection infrastructure, thereby avoiding the need for Western to purchase, install or maintain data collection towers.

Table 1. AMI Phase 3 Meter Installation

AMI Phase 3	Quantity
5/8" Registers	166
5/8"T-10 Meter	201
3/4" T-10 Meter	1,001
1" T-10 Meter	293
1.5" T-10 Meter	48
2" T-10 Meter	65
2" Mach10 Meter	16
3" Mach10 Meter	15
4" Mach10 Meter	17
6" Mach10 Meter	4
8" Mach10 Meter	5
10" Mach10 Meter	1
12" Mach10 Meter	3
Total Meters	**1,835**
Lids	1,683
Bolts for 1.5" and above	167

In April 2021, a consultant developed a District Metered Area (DMA) Plan. DMAs are a means to analyze and control water loss. This DMA Plan describes the advantages of setting up DMAs, document the process for developing and managing DMAs, and recommends the number, size, and location of potential DMAs in Western's water system. The DMA Plan is part of the Phase 3 Water System Optimization Study and relates to several previous, current, and future efforts at Western. After completing the DMA plan in April 2021, Western identified three

pilot DMA locations to develop a process for collecting and analyzing water loss data. In June 2022, a consultant developed a DMA Implementation Plan (Attachment C). The DMA Implementation Plan identified three metering locations and required meter infrastructure. Western has existing meters that monitor the flow entering the Lake Hills DMA and the Victoria Grove DMA. These meters take flow readings every minute. The flow readings are stored and may be viewed using the supervisory control and data acquisition (SCADA) system and can be exported to a comma-separated values file (CSV). The proposed project will purchase and install two Mccrometer Insertion meters, meter vaults, PLC, and programming on Rolling Meadows Pressure Reducing Value Station (PRV) and Hillside Pump Station. Full-bore electromagnetic (mag) flow meters are recommended for water sources, pump stations, and flows in and among DMAs. Mag meters are accurate, reliable, and easy to use. They can measure velocities from 0.10 to 39 feet per second (ft/s). Mag meters can be installed on ¼ to 72-inch (in.) diameter pipes. Flows ranging from about 0.01 to 37,000 gallons per minute (gpm) can be metered depending on the size of pipe. The lower ranges of velocity and flow are important as accuracy diminishes below these limits. Mag meters will be installed to provide manufacturer-recommended upstream and downstream straight-run lengths of pipe. These straight-run lengths may vary depending on the meter manufacturer and may range from 2 to 10 straight pipe diameters measured from the electrode plate. New mag meter technology is available with extra sensors to correct for turbulence and thereby eliminating the minimum upstream and downstream lengths. Once the Rolling Meadows PRV and Hillside Pump Station meter is installed, Western operations staff will have the ability to view and export flow data in the same format as the existing Lake Hills and Victoria Grove meters.

The proposed scope of work is for Phase 3 of Western's AMI program, which also includes the implementation of DMA.

Previous AMI Phases

There have been two previous phases of Western's AMI program that have been implemented. In January 2018, a total of 100 meters were installed in the Orangecrest portion of the Riverside Service Area. The AMI Pilot had a couple of purposes: (1) to start with a small volume of data and make sure the necessary data processing is streamlined before the larger rollout of AMI when large volumes of data will be received and (2) identify which parts of the Western organization is affected by the smart metering and make sure all affected have appropriate training. Phase 1 meter replacements and retrofits identified replacement of 10,645 sites that were 15 years or older. Phase 1 involved replacing 7,517 meters with a ¾" Neptune meter, 2,679 meters with a 1" Neptune meter, retrofitting 449 meters with a new integrated register and radio, and 10,645 meters getting a lid replacement to accommodate the transmitter. Phase 1 began in April 2018. Full implementation

was completed by May 31, 2019. Phase 2 meter replacements occurred for 7,008 sites that are 5 years or older. Phase 2 involves replacing 5,770 meters with a ¾" Neptune meter, 1,238 meters with a 1" Neptune meter, and 7,008 meters getting a lid replacement. Phase 2 also included the development of a Customer Portal. Phase 2 project began in January 2020 and completion is anticipated in September 2022. No funding is requested for previous phases.

Phase 3 will complete Western's AMI infrastructure, where all customers have access to near-time usage and Western's already constructed Customer Portal. In addition, with all customers having AMI meters, Western can begin implementation of District Metered Areas, providing the ability to detect and respond to leaks in a timelier manner.

1.4. Evaluation Criteria

A. Quantifiable Water Savings

1. 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 total annual project water savings are estimated at 800 AFY due to water loss.

In 2021, Western's total water demand in the project area was 22,288.8 AFY with 2021 water loss equaling 1,200.7 AFY (5.35%).

Assuming 75% of this water loss is recoverable, due to all of Western's meters providing hourly usage, access to the Customer Portal and associated Meter Data Management System, and the implementation of District Metered Areas, the water savings is 75% of the 5.35% water loss (4%). The estimated water savings is therefore 800 AFY.

The meter infrastructure has a useful life of at least 15 years. Therefore, total water savings over the life of the project is 800 AFY*15 = 12,000 AF.

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

> *2.a. Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

An estimated 800 AFY that will be conserved due to this Project currently is water loss due to leaks or broken meters. Currently, the water loss seeps into the ground or runs off into storm drains.

> *2.b. If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?*

It is not known how current losses are being used. Most of Western's customers sit on bedrock and do not have access to local ground water. If losses are entering the groundwater table, it is not retrievable.

> *2.c. Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?*

There are no known benefits associated with where the current losses are going. Western's service area is not directly connected to local surface waters and sits on bedrock. Seepage water is not providing additional habitat for fish or animals.

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

According to Western's 2020 Urban Water Management Plan (UWMP) (adopted in 2021), distribution system water losses in Western's retail sector make up 5.35 percent of total retail water use. Further, according to the EPA, it is estimated that 75 percent of average system water losses are recoverable (EPA 2013, Attachment D). This means, approximately 4 percent of Western's system water use could be saved through improved water loss control.

<u>AMI</u>

The following data provide supporting documentation of estimated water savings from implementing AMI projects. These findings indicate that Western's 4% water loss estimate is a conservative way to estimate water savings benefits. According to a 2016 paper in the Journal of Environmental Management, which explores the impact of customer-specific water use information on consumption patterns, daily consumption data from smart water meters can reduce water consumption by an average of 9% (Fielding 2016). Additionally, a 2014 pilot study at East Bay Municipal Utility District (EBMUD), which supplies water throughout the San Francisco East Bay, installed water AMI systems that provided hourly water consumption data to customers through an online web portal. EBMUD found water savings between 5-50%, with an average of 15%, among residential customers after the installation, while noting that some of these savings are likely due to customer-side leak repair (EBMUD 2014). Another recent report by Water Research Foundation, "Residential End Uses of Water, Version 2", found that leaks account for 13% of all residential indoor water consumption across the U.S. (DeOreo 2016). According to Los Angeles County Waterworks, staff polled other agencies and consultant experience and determined that a robust AMI system is estimated to achieve a 10% reduction in per capita water consumption. When investigating other water utilities that have implemented AMI technology, it is evident that there are significant benefits from this type of implementation.

<u>District Metered Areas</u>

The following data provide supporting documentation of how water can be saved from implementing DMA projects. If a new 10 gpm leak occurs in a water system that supplies 10,000 gpm, that leak will be lost among the other changes in flow that normally occur in such a large system. However, if that leak occurred in a zone where the average demand is 100 gpm, that leak will be noticed, and the water system can respond. That is the fundament concept behind DMAs which are now widely used in some systems to monitor unusual demands that are generally caused by leaks. A DMA is a portion of a water system for which all inflows and outflows (and variations in tank water volumes if there are tanks in the DMA) are monitored. One way to get a better understanding of water loss and identify where to place resources is to track flow through the system. DMAs that appear to have high water loss can receive more attention in water loss reduction programs. To understand where water loss is high, it's necessary to install flow meters and subdivide the system into DMAs.

DMAs can reduce water loss several ways:

- By tracking total flow into a DMA and comparing with metered consumption, utilities can identify where both real and apparent loss is high.
- By tracking minimum nighttime flow in a DMA, the utility can identify additional water loss quickly.

There are not many studies published that highlight the quantifiable savings related to DMA implementation. One study, published in the United Kingdom in 2015, found that in a case study of an unnamed utility, the economic performance by implementing DMAs calculated a leakage reduction benefit range of approximately 26-59% (Economic Performance of DMAs in Water Distribution Systems – ScienceDirect).

Western's Experience

Western has undergone a pilot project related to AMI in January 2018 where a total of 100 AMI meters were installed. With the AMI data, Western was able to identify that 20% of customers were experiencing a leak and the leak occurred for longer than 24 days. In April 2018, Western implemented Phase 1 of our AMI project and installed 10,645 AMI meters on meters older than 15 years old. In January 2020, Western implemented Phase 2 which installed 7,008 AMI meters, a Meter Data Management System, and a Customer Portal.

Western's 2015 UWMP had distribution water losses make up 15% of total water use. For the 2020 UWMP, distribution water loss was calculated for 2016-2020. In 2016, water loss in Riverside's service area was 20% and Murrieta has a long-term average of 11%. In 2021, both service area's water loss is between 5-6%. This is a direct result of Western's implementation of the AMI Phase 1 and 2 project, the primary project in Western's water loss reduction group. The previous implementation of AMI has reduced the average percent of system water loss over the past 5 years by 9-10%.

The difficulty with most public agencies deciding to install AMI meters and implement District Metered Areas is that there has not been a consensus on how much water could be saved from these efforts. There have only been a few case studies and a majority of the case studies are not representative of Western's service area. The closest in representation is the Los Angeles County Waterworks, a member agency of Metropolitan Water District of Southern California, same as Western, conducted an informal study stating that on average 10% of water use was recovered through AMI implementation. As described above, Western also saw a reduction of 10% in the previous implementation of AMI Phase 1 and 2. With EPA's assessment that 75% of water loss is recoverable, the proposed water savings of 800AF or 4% of the water supply (75% of the 5.35% of 2021 average water loss) includes the entire project, both AMI Phase 3 and the DMA Implementation.

Therefore, as a conservative estimate, Western is estimating 75% of the retail water loss is recoverable through the implementation of this project.

Calculations for Water Savings:

Water Savings Related to Water Loss = 800 AFY

- Riverside Treated 2021 Water Production = 20,037.2 AFY
- Riverside Treated 2021 Water Loss = 1,077.4 AFY (5.2%)
- Murrieta Treated 2021 Water Production = 2,251.6 AFY
- Murrieta Treated 2021 Water Loss = 123.3 AFY (5.5%)
- Total Project Area Demands = 22,288.8 AFY
- Total Project Area Water Loss = 1,200.7 AFY (5.35%)
    - Western's Water Loss Task Force Internal Report for 2021
- 4% annual water savings from project implementation (75% EPA estimate of recoverable water loss)
- 22,288.8 AFY*0.04 = 891.55 AFY
- Conservative Estimate – Round down to 800 AFY

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

4.(2). Municipal Metering:

4.(2).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.

Total annual project water savings are estimated at 800 AFY. The AMI meter infrastructure has a useful life of 15 years. The DMA meters have a useful life of 20-30 years. To be conservative, 15 years useful life will be used. Therefore, the total water savings over the life of the project is 800 AFY*15 = 12,000 AF.

- Total Area Demands = 22,288.8 AFY

- 4 percent annual water savings from project implementation (75% EPA estimate of recoverable water loss)
- 22,288.8 AFY*0.04 = 891.55 AFY
- Conservative Estimate - Round down to 800 AFY

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

In 2021, Western prepared a water loss audit consistent with the American Water Works Association (AWWA) Manual 36 methodology. This audit found that Western's total retail sector water losses amounted to approximately 5.35 percent of total retail water use, or over 1,200.7 AFY in the treated Riverside and Murrieta service area.

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

According to Western's 2020 UWMP (adopted in 2021), distribution system water losses in Western's retail sector make up 5-6 percent of total retail water use. According to the EPA, it is estimated that 75 percent of average system water losses are recoverable (EPA 2013). This means, approximately 4 percent of Western's system water use could be saved through improved water loss control.

There have only been a few case studies and most of the case studies are not representative of Western's service area. The closest in representation is the Los Angeles County Waterworks, a member agency of Metropolitan Water District of Southern California, same as Western, conducted an informal study stating that on average 10% of water loss was recovered through AMI implementation.

Findings in other studies, like East Bay Municipal Utility District (Attachment E), found a savings related to leak detection from their AMI installation of 15%. In addition, Western's pilot project, 20% of the customers were indicating a leak for 24 days straight. From verbal communication, Rancho California Water District (RCWD), one of Western's wholesale agencies, is expecting to recover over $8 million in revenue over 5 years and stop over 200 AF of water annually.

There are also not many studies published that highlight the quantifiable savings related to DMA implementation. One study, published in the United Kingdom in 2015, found that in a case study of an unnamed utility, the economic performance by implementing DMAs calculated a leakage reduction benefit range of approximately 26-59% (Economic Performance of DMAs in Water Distribution Systems – ScienceDirect).

As described above, Western also saw a reduction of 10% in the previous implementation of AMI Phase 1 and 2. Therefore, as a conservative estimate, Western is estimating 75% of the retail water loss is recoverable through the implementation of this project. As water loss decreases system wide, the water savings impact may be less, therefore 4% is a conservative estimate.

Again, the difficulty with most public agencies deciding to implement AMI and DMA to customers is that there has not been a consensus on how much water could be saved through hourly water usage access and conservation messaging, leak detection, and District Metered Areas. There have only been a few case studies and a majority of the case studies are not representative of Western's service area. With EPA's assessment that 75% of water loss is recoverable, the proposed water savings of 800AF or 4% of the water supply (75% of the 5% average water loss) includes the entire project, both AMI Phase 3 and the DMA Implementation.

The previous subsections also detail the assumptions in the calculations, including examples from Western's Phase 1 and 2 AMI program. Western's previous successes with water loss reduction and AMI implementation indicate that 4% estimate for water savings is conservative, yet reliable.

4.(2).d. What types (manufacturer and model) of devices will be installed and what quantity of each?

For the AMI portion for the project, equipment to be installed will include 5/8-inch, 3/4-inch, 1-inch, 1.5-inch, 2-inch, 3-inch, 4-inch, 6-inch, 8-inch, 10-inch, and 12-inch water meters (T-10 and Mach10 meters), 5/8" registers, and meter box lids. Table 1 shows the quantity of each meter size and type. Neptune R900i LoRa meters will be used for this Project. Neptune will also provide the data collection infrastructure, thereby avoiding the need for Western to purchase, install or maintain data collection towers. For the DMA portion of the project, Western will install two McCrometer Smart Output electromagnetic (mag) meters.

4.(2).e. How will actual water savings be verified upon completion of the project?

Western has a monitoring plan that will capture, verify, and document the project benefits. Specifically, Western will track:

Overall Water Savings. With project implementation, Western will be able to monitor real time water use and review usage trends. Total water savings resulting from project implementation will be quantified by comparing water meter consumption data from each newly installed or retrofitted AMI 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 received previous AMI meter upgrades or replacements to increase robustness of results. This analysis will allow Western to calculate the actual amount of water saved because of project implementation.

Water Savings from Leak Detection. Western will also compile and analyze data related to water savings from early leak detection. One of the important benefits of the AMI system is that it can provide real time data in combination with high accuracy of high and low flows, which facilitates early leak detection. In addition, alerts 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. Western will track the number of alerts triggered, related amounts of water that resulted in the alert, and related responses. Using this information, Western will be able to estimate what proportion of total water savings is made up of early leak detection savings.

DMA. DMAs are defined areas where metered flows in and out can help determine levels of leakage and, therefore, prioritize leak control efforts by location. Once a DMA is established it must be constantly monitored in order to determine background leakage and to accurately identify new leaks. Using SCADA, monthly water loss percentage will be calculated among the three DMA areas developed for this project and compared to the rest of the system.

B. Renewable Energy

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

The project does not implement a renewable energy project but will increase energy efficiency.

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

1. Describe any energy efficiencies that are expected to result from implementation of the water conservation or water efficiency project.

1.a. If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations.

Reduction in water loss comes from Western's imported supplies, from the Bay-Area Delta and through Metropolitan Water District of Southern California (Metropolitan) (a State Water Project Contractor). Due to the water-energy nexus, reduced demands resulting from the project will also result in reduced energy requirements and related emissions associated with source production, conveyance, and treatment requirements. Assuming the project will result in 800 AFY less water diverted from the Delta and transported via the State Water Project (SWP) to Western's distribution system, the project would result in annual energy savings of

approximately 2,588,800 kWh per year. This is based on an estimate that the SWP East Branch has a water energy intensity of 3,236 kWh/AF.

1.b. How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.

The water savings will combat climate change in California through the reduction in energy usage and its corresponding reduction of greenhouse gas emissions. 1 kWh of electricity, when produced from a coal burning power plant, will generate 0.94 kg (or 2.07 lbs) of CO2 emissions to the atmosphere according to Carbon Neutral Charitable Fund (CNCF). 1kg is equal to 0.00110231131 tons. Therefore, it is anticipated that the project will eliminate 2,679 tons of CO2 per year (2,588,800 kWh*0.00110231131 tons CO2/kWh).

The Project will reduce energy demands for California by 38,832,000 kWh and 40,185 tons of CO2 over the 15-year lifetime of the project, providing more energy resources for other projects and reducing greenhouse gas emissions in California.

1.c. If the project will result in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements and energy usage?

The water saved from this Project will come from Western's imported supplies provided by Metropolitan. The project does save a substantial amount of electricity through decreasing the amount of imported water consumed. The imported water has a high energy load related to the pumping, distribution, and treatment of the water. Due to the State of California's request for each agency to reduce demand on the Bay-Area Delta, the saved water would stay at its source, in the Delta. It is anticipated that pumping would be reduced, and corresponding energy usage would be reduced. The water system is not operated by Western, but by the State Water Project. Therefore, specifics on the impact to current pumping impact is not available.

The SWP's energy intensity for the water received from the East branch it is 3,236 kWh/AF. These values are the nominal pumping requirements of the SWP pumps (Banks, Dos Amigos, Buena Vista, Teerink, Chrisman, Edmonston, Oso, and Pearblossom) less the nominal generation values from the West and East Branch recovery generating plants (Warne, Castaic, Alamo, Mojave, and Devil Canyon). These values exclude pumping and generating at the San Luis Gianelli Plant.

1.d. Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.

The energy savings estimate originates from the SWP East Branch. This is not the point of diversion but includes the energy from point of diversion: Bay-Area Delta and the travel through the majority of the SWP and MWD system. The true energy conserved is likely higher due to additional travel distance to Western.

1.e. Does the calculation include any energy required to treat the water, if applicable?

The SWP East Branch energy intensity does not include treatment. An additional 69.7 kWh/AF is saved from not treating the water, providing an additional energy savings of 55,760 kWh/year for the project.

1.f. Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.

The project's energy savings does not include reduction in vehicle miles saved. Added energy savings is expected due to the reduction of miles driven from the AMI and DMA implementation.

1.g. Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

There are no renewable energy components to the project.

C. Sustainability Benefits

***1. Enhancing drought resiliency**. Please provide information regarding how the project will enhance drought resilience by benefitting the water supply and ecosystem, including the following:*

Western was formed in 1954 and provides water supply, wastewater treatment and disposal, and water resource management to nearly one million people in a service area covering roughly 527-square miles. As a member agency of Metropolitan, Western provides wholesale water to the region within its service area. Western also directly serves water to approximately 25,000 retail customers portions of the cities of Riverside and Murrieta. Western's retail service area currently receives its potable water supply from two sources: imported water through Metropolitan, and adjudicated groundwater from the San Bernardino Basin Area, Riverside Basin, and the Temecula-Murrieta Basin. Metropolitan imports water to Southern California from the Colorado River and runoff from the western slopes of the northern Sierra Nevada Mountains, an area with unprecedented impact by drought.

Western is located in Southern California, in the Santa Ana Watershed. All of Western's water sources of these sources are constrained in one or more ways, driven by climatic and hydrologic conditions, water quality, and legal restrictions, as well as potential for interruption of supply driven by catastrophic events.

Western continues to experience dry weather following the third driest year on record in 2021. With the driest January and February on record, this dry 2022 year needs water use efficiency and leak detection more than ever. Also, because of climate change, as of 2050, droughts will be twice as likely to occur. Extreme heat days are projected to increase 250 percent by 2050 and 500 percent by 2100 and heat wave duration is expected to increase 174 percent by 2100 (CDC, Climate and Health). Coupled with current drought conditions, the most recent California Executive Order from Governor Newsom, N-7-22, calls on local water suppliers to

shift to "Level 2" of their individual Water Shortage Contingency Plans, which involves taking preparatory actions for water shortage levels of up to 20 percent. Western entered Stage 2 in January 2022 asking customers to reduce their water usage by 20 percent.

To increase water supply reliability and proactively address the region's concern with drought, in 2021 Western embarked on the preparation of a regional Drought Contingency Plan (DCP), funded in part by the United States Bureau of Reclamation (Reclamation). The DCP was adopted by Western's Board of Directors on July 20, 2022. The DCP document can be found at www.wmwd.com/uwmp.

Western's DCP includes considerations of climate change impacts to water resources or drought. A vulnerability assessment was conducted through the development of the DCP (chapter 4). The vulnerability assessment performed aimed to improve the understanding of climate change impacts on future water demand in Western's wholesale service area and the sources of Western's water supplies during normal and drought periods.

In its climate change vulnerability analysis, Western's Drought Contingency Plan identified the key supply vulnerabilities to climate change as the following:

- ❑ Insufficient local water supply
- ❑ Increase dependence on imported supply
- ❑ Inability to meet water demand during droughts
- ❑ Shortage in long-term operational water shortage capacity

Increasing concerns exist about the reliability of imported water, particularly from the Bay-Area Delta, driven by climate change, competing demands and environmental goals. As part of the 2020 updates to its UWMP and Integrated Water Resources Plan (IRP), Metropolitan evaluated the reliability of these supplies and concluded that if nothing is done to invest in water supplies or conservation, supply short-falls are likely to occur in the future. As of July 2022, Metropolitan has identified short-falls for the next fiscal year, providing water allocations to agencies that are SWP dependent.

Potential constraints to Metropolitan supplies, and thus to 70% of Western's retail demands, and associated supply reliability include:

- ❑ Drought: The Colorado River has been in drought conditions for much of the past 15 years, exacerbating claims to water in the River. The Sacramento-San Joaquin Delta (Bay-Area Delta) has suffered reduced flows and rising temperatures in the current drought, and SWP supplies have been significantly curtailed during the current drought.
- ❑ Environmental/Ecological Needs (Operational Constraints): Sensitive species in the Bay-Area Delta system require base flows for survival; these flows are threatened by drought and other factors, reducing the volume of water available for pumping to the SWP. As species become further stressed, environmental demands on Bay-Delta water may increase.

- Climate Change: Climate change is anticipated to increase the frequency and intensity of droughts and flooding, alter the timing of snowmelt, and increase variability in precipitation while raising average temperatures. These effects may reduce the availability of supplies in the Bay-Area Delta and Colorado River systems, as well as change the timing of availability, which could reduce Metropolitan's ability to utilize the supplies that it can access, all while demands are anticipated to increase as a result of climate change. Sea level rise poses a significant challenge to the salt balance in the Bay-Area Delta with likely impacts to the supply balance that can be expected. Sea level rise also increases the vulnerability of the Bay-Area Delta supply to seismic events.
- Threats to Infrastructure: Metropolitan's imported supplies must travel across large distances to reach turnouts where local agencies are able to access the water. California is a seismically active state, prone to wildfires, which could damage imported water infrastructure anywhere along the SWP or Colorado River Aqueduct in such a manner as to disrupt supply availability. California is also a large state with a large economy, housing some major industries and defense installations. This makes it a potential target for acts of terrorism, including potential threats to its water supplies and infrastructure.

During the development of the DCP, Western's Drought Task Force members participated in a drought mitigation survey where all members had an opportunity to submit projects that would help their agency mitigate drought. The Project is listed in Western's DCP to help Western conserve water and enhance regional water supply reliability and resiliency.

The Project directly addresses a heightened competition for finite water supplies and over-allocation (e.g., population growth) by using smarter technology and more advanced infrastructure to better manage the water supply.

By savings 4% of Western's water demand through this Project, Western is making a more resilient water system and giving a beneficial use back to the lost water supply (keeping it at its source per the Reduced Reliance on the Delta statewide initiative).

1.a. Does the project seek to improve ecological resiliency to climate change?

Conserving 800 AFY of water will decrease the amount of water Western purchases from the SWP, reducing the demands on the Bay-Area Delta. With climate change affecting California's water supply through more intense rainfall, less snowpack, and more frequent and severe droughts, there is less source water for the Bay-Area Delta. Reducing imported water demands from the Bay-Area Delta allow for reduced source flows to stay in the Bay-Area Delta, improving ecological resiliency.

Reducing imported water from the SWP is a direct benefit to the Delta Smelt and other species, such as the Shad and Striped Bass. Reducing the amount of water

Western takes from the Bay-Area Delta allows water to stay in this vital ecosystem, where many of the aquatic species are endangered or threatened.

For example, the endangered Delta Smelt, which is endemic to the upper Sacramento-San Joaquin Estuary that mainly inhabit the freshwater-saltwater mixing zone. With more freshwater being diverted to the SWP, the mixing zone becomes more brackish and further endangers the Delta Smelt, which causes a ripple effect on the ecosystem. Since the implementation of this project will reduce the amount of water exported from Northern California stream systems, there will be a positive benefit for the sensitive in the Sacramento–San Joaquin River Delta including the Delta Smelt (federally endangered) and its critical habitat, and Longfin Smelt. With the 2017 wet year, the American Shad and the Striped Bass population increased, where the previous dry years had a negative impact on population. It is no question that extra fresh water in the Bay-Area Delta had a positive impact on the fish populations.

Thus, the less water taken from the Bay-Area Delta during the wet and dry years is beneficial to the habitat and the species that inhabit the Bay-Area Delta. In summary, this project does improve ecological resiliency of the Bay-Area Delta due to projected climate change impacts.

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

By installing AMI Phase 3 and DMA, Western will be able to reduce water demands by approximately 800 AFY. The conserved water would essentially remain at its source, in the Bay-Delta, to help maintain instream flows and improve ecosystem health. As a result of the Project, Western will be able to put water supplies to better use, increasing water reliability for its customers.

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

The project will benefit species living the in Bay-Area Delta, like the Delta Smelt. Delta Smelt was listed as threatened under the Federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA) in 1993. In 2009, CESA status was changed to endangered. In 1996, the United States Fish and Wildlife Service adopted a recovery plan for the Delta Smelt.

The causes for Delta Smelt decline are multiple and synergistic, and it is likely that different causes are important in different years. Some single causes outlined in Moyle, (2002) include:

- Reduction in freshwater outflows
- Entrainment losses to water diversion
- High outflows
- Changes in food organisms
- Toxic substances
- Disease, competition, and predation
- Loss of genetic integrity

Reducing the amount of water Western takes from the Bay-Area Delta allows water to stay in this vital ecosystem, where many of the aquatic species are endangered or threatened, including the federally endangered Delta Smelt, which is endemic to the upper Sacramento-San Joaquin Estuary that mainly inhabit the freshwater-saltwater mixing zone. With more freshwater being diverted to the SWP, the mixing zone becomes more brackish and further endangers the Delta Smelt, which causes a ripple effect on the ecosystem. Since the implementation of this project will reduce the amount of water exported from Northern California stream systems, there will be a positive benefit for the Sacramento–San Joaquin River Delta including the Delta Smelt and its critical habitat. With the 2017 wet year, the American Shad and the Striped Bass population increased, where the previous dry years had a negative impact on population. It is no question that extra fresh water in the Bay-Area Delta had a positive impact on the fish populations. Thus, the less water taken from the Bay-Area Delta during the wet and dry years is beneficial to the habitat and the species that inhabit the Bay-Area Delta.

1.d. Please describe any other ecosystem benefits as a direct result of the project.

All ecosystem benefits have been described.

1.e. Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?

By installing AMI Phase 3 and the DMA, Western will be able to reduce water demands by approximately 800 AFY. Approximately 70% of this water is imported water from Metropolitan Water District and the State Water Project.

Meter Reading Accuracy and Automation

Smart meters have exceptional accuracy at low to high flow conditions, thereby enabling Western to bill customers more accurately according to use and preventing under or overbilling. This accuracy is also critical for detecting leaks.

Reading of the manual-read meters is a labor-intensive effort requiring Western staff to physically read meters on-site along numerous routes on a monthly basis. The AMI system will have fixed base antennas which allows meters to be read remotely because they automatically collect meter read data and then re-transmit water usage data to a centralized server that Western has access to.

The automation will reduce errors from manual readings, improve meter reading accuracy, and reduce use of resources, including staff time and fuel for vehicles related to manual meter readings.

Data Transparency and Water Waste Detection

One of the primary benefits of the Project is the ability to identify water leaks more easily. With the meter upgrades, Western will have near real-time water use data. The AMI systems will transmit hourly water consumption data via a wireless network to Western's customer service center four times a day. The improved transparency of water usage will alert staff of potential leaks, meter tampering, over-usage or other inefficiencies in the system. Near real-time water consumption data will show sharp spikes in usage or unusual continuous use if a leak is present indicating small leaks or possibly a catastrophic pipeline break. With this type of transparency, Western can more easily locate leaks, alert customers of the issue, and save both money and water. This can also prevent customers from receiving large water bills due to undiscovered leaks in their water system.

Customer Portal

AMI meters collect and transmit hourly water meter readings to Western. These 1,835 customers receiving an AMI meter in the Project will gain access to Western's Customer Portal. Western's customers also gain access to their hourly readings. Western customers will not have to wait until their monthly bill comes to know how much water they are using. All of Western's customers will see near real-time hourly usage from an internet portal, including a comparison of current usage with prior month or prior year usage.

District Metered Areas

A DMA is a discrete area of a distribution system created by the closure of valves or disconnection of piping, in which the quantities of water entering and leaving the area are measured. DMAs enable more precise analysis of and faster response to water loss by dividing a large distribution system into smaller pieces. As population and water use increase, water delivery must become more efficient. One solution to mitigate water loss is to create a permanent leakage control system by dividing the distribution network into smaller areas. When water imports, exports, and consumption in these regions are metered, they become DMAs. By monitoring water use on a smaller scale, DMAs can help identify, prioritize, and resolve water loss at locations with the most leakage.

There are several project benefits that relate to water supply concerns and effective management:

- By getting AMI hourly reads, Western is able to better understand customer patterns and their water needs. This provides Western with knowledge and

information to set baselines and understand who could be impacted in water supply reductions, increasing water supply resiliency.

- By getting DMA areas, Western is able to respond faster and more effectively once a water leak occurs. This allows limited staff to identify, prioritize, and remediate leaks.
- With hourly reads, Western can better enforce Drought Contingency Plans, Water Shortage Continency Plans, and enforcement actions in times of drought.
- Statewide Conservation Targets have been developed from the latest drought and the growing concern over climate change. Accurate readings and decreasing water loss can provide Western with more accurate numbers for Gallons per Capita Daily (GPCD) and can help Western set new targets and meet current and future statewide conservation goals, increasing Western customer's resiliency to climate change.

The project also directly contributes to reducing irrecoverable water losses. The AMI technology and DMA project will reduce water inefficiencies of the targeted customers by facilitating leak identification, highly improved metering accuracy and improved customer awareness. Western has an operational policy to use local supplies first and supplement with imported water. By not losing approximately 800 AFY of water supply, Western is able to utilize more water from local supplies. It is the goal of Western to be able to provide local water supplies for each customer's water budget (Water budget is Tiers 1 and 2). Imported water would be used for customer's going over their water budget. By losing less water from leakages, Western is getting closer to meeting its goal and decreasing concerns over water reliability.

The conserved water would essentially remain at its source, in the Bay-Area Delta, to help maintain instream flows and improve ecosystem health.

As a result of the Project, Western will be able to put water supplies to better use, increasing water reliability and effective water management for its customers.

In addition, the project complies with Senate Bill 555 on water loss management. Meter replacement will help increase the score on Western's yearly validated water audit. Further, the project is envisioned in Western's UWMP. Western's meter testing and replacement program is described in its 2020 UWMP and the project is a targeted improvement on the meter replacement program.

2. Addressing a specific water and/or energy sustainability concern*(s). Will the project address a specific sustainability concern? Please address the following:*

2.a. Explain and provide detail of the specific issue(s) in the area that is impacting water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.

Western is experiencing water shortages due to drought and climate change.

California's water system is built upon snowpacks that melt slowly over several months and fill the state reservoirs. Snowpack is crucial for California residents, because it provides about a third of the state's water supply during the spring and summer seasons. During the water year (October to September), the state collects, analyzes and disseminates snow data from more than 265 snow courses and 130 snow sensors located throughout the Sierra Nevada and Shasta-Trinity mountains.

Generally, the snow is at its deepest in April. Usually, it's at about shoulder height in many regions. In over 100 years, California experienced its driest season on record. From January through March 2022, California's only received about half the amount of rainfall recorded in comparison to 2013, which ended up turning into the driest calendar year on record.

The snowpack levels get fed into the State Water Project's calculator (which includes other factors like estimated runoff) and gives the State Water Project Contractors (like Metropolitan) their water allocation. This year, the SWP contractors are receiving just 5% of their total allocation.

Western continues to experience dry weather following the third driest year on record in 2021. With several dry years in a row, the SWP allocation, and reservoir levels throughout the state, all of CA has been in a declared drought emergency since October 2021, with the governor calling for 15% voluntary water reduction compared to 2020.

With the driest January and February on record, this dry 2022 year needs water use efficiency and leak detection more than ever. Due to current drought conditions, the most recent California Executive Order from Governor Newsom, N-7-22, issued in March 2022, calls on local water suppliers to shift to "Level 2" of their individual Water Shortage Contingency Plans, which involves taking preparatory actions for water shortage levels of up to 20 percent. Western entered Stage 2 in January 2022 asking customers to reduce their water usage by 20 percent.

Long term effects of drought will lead to reduced deliveries of imported water supply and increased demand in outdoor water use due to increased rates of evapotranspiration (Western's Drought Contingency Plan).

2.b. Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.

Western's Risk and Resilience report identified earthquakes and wildfires as high-risk, frequent hazards in California, putting Western's water conveyance infrastructures at high-risk of damage. With climate change, the probability of wildfires will increase (U.S. Geological Survey). With earthquakes and wildfires being hazards in California, water conveyance infrastructures and power utilities are at high-risk of damage. With most of Western's water travelling a long distance—over hundreds of miles—the probability of an earthquake or damaging

wildfire increases because we are not just looking at the probability of those events occurring in Riverside County, but throughout the state. The risk of a natural hazard increase the more distance Western's water supply travels. The higher probability of these natural events may cause greater interruptions to Western's service.

2.c. Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?

Water Sustainability – By reducing water losses and 4% of system demand, the 800 AFY will directly address the current drought and climate impacts. The 800 AFY will stay at its source, the Bay-Area Delta, helping improve the water supply conditions. In addition, this Project will help Western meet 20% of the state's 20% reduction goal. In addition, the water savings will continue over the lifetime of the project providing more flexibility and resiliency in future droughts and water shortages. Most importantly, by increasing efficient use of available water supplies, the project will contribute to improved water supply reliability, by making saved water available to meet other demands.

Energy Sustainability - By decreasing imported supply, the risk of infrastructure damage due to earthquakes and wildfire become more locally centered, therefore system reliability increases, and hazard risk reduces.

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

The conserved water would essentially be left in the river/ remain at its source, in the Bay-Delta, to help maintain instream flows and improve ecosystem health.

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

There is no mechanism to put conserved water to its intended use. Less water lost means less water taken. The water conserved increases water reliability, because less water will be diverted from the Delta River, increasing the health of the Delta and its ecosystem, decreasing water restrictions due to habitat health and shortage supply.

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

800 AFY will be saved due to water loss.

***3. Other project benefits**. Please provide a detailed explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:*

3(1). Combating the Climate Crisis: E.O. 14008: Please describe how the project will address climate change, including:

> *3(1)a. Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.*

In its climate change vulnerability analysis, Western's Drought Contingency Plan identified the key supply vulnerabilities to climate change as the following:

- ❑ Insufficient local water supply
- ❑ Increase dependence on imported supply
- ❑ Inability to meet water demand during droughts
- ❑ Shortage in long-term operational water shortage capacity

As described in Metropolitan's IRP and UWMP 2020 update, climate change is anticipated to increase the frequency and intensity of droughts and flooding, alter the timing of snowmelt, and increase variability in precipitation while raising average temperatures. These effects may reduce the availability of supplies in the Bay-Area Delta and Colorado River systems, as well as change the timing of availability, which could reduce Metropolitan's ability to utilize the supplies that it can access, all while demands are anticipated to increase as a result of climate change. Sea level rise poses a significant challenge to the salt balance in the Bay-Area Delta with likely impacts to the supply balance that can be expected. Sea level rise also increases the vulnerability of the Bay-Area Delta supply to seismic events.

By reducing 800 AFY of water loss, the saved water would remain at its source, the Bay-Area Delta. With the 800 AFY being lost due to water loss, the current water is not beneficially used. The Project will allow the 800 AFY to stay at its source and help reduce the region's reliance on imported water supply and mitigate the impacts of climate change on the source supply for the Bay-Area Delta.

> *3(1)b. Does this proposed project strengthen water supply sustainability to increase resilience to climate change?*

This project strengthens water supply sustainability which in turn increases Western's resilience to climate change.

The AMI project shall achieve the goal of measuring water savings and thereby, reduces water waste. The new meters have the ability for customers to set alerts for water consumption and to identify leaks that will lessen the demand for water. The widespread use translates to a reduction in the amount of imported water demanded, leaving more water available in the SWP water system and therefore, ensuring reliability of water year-round. As drought conditions continue to

challenge the region, AMI technology will provide new tools that empower customers to make better decisions, about their water use. AMI is proving to be an effective solution around the world for educating consumers about their water consumption and the impact such conservation would have in reducing expenses. Implementing DMA areas allow for Western's water managers to identify, prioritize, and respond to larger system leaks. This enhanced meter and DMA implementation has the potential to yield reductions in water use and water loss and increased conservation awareness by all customer groups served and ultimately, contribute to the achievement of sustainable solutions to water supply reliability. As a result of the project implementation, water saved will reduce water importation and shall support ecosystem restoration and water quality.

3(1)c. Will the proposed project establish and utilize a renewable energy source?

As described in Section B, sub criteria 2, question 1a, the Project will not establish a renewable energy source but will reduce energy consumption by 2,588,800 kWh per year or 38,832,000 kWh over the 15-year lifetime of the project, providing more energy resources for other projects.

3(1)d. Will the project result in lower greenhouse gas emissions?

It is anticipated that the project will eliminate 2,679 tons of CO2 per year or 40,185 tons of CO2 over the 15-year lifetime of the project, providing more energy resources for other projects.

3(2). Disadvantaged or Underserved Communities: E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including:

3(2)a. Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community?

The Project will provide AMI meters and monitoring of customer and distribution level water usage to Western's Riverside and Murrieta Service Areas. 25% of the community is a disadvantaged community, as defined by household median income (Figure 2). The disadvantaged community will directly receive the new meters and the monitoring ability.

The Project may provide financial benefits to customers receiving meter upgrades through timely leak detection and water conservation which could reduce water bills, directly benefiting the disadvantaged community.

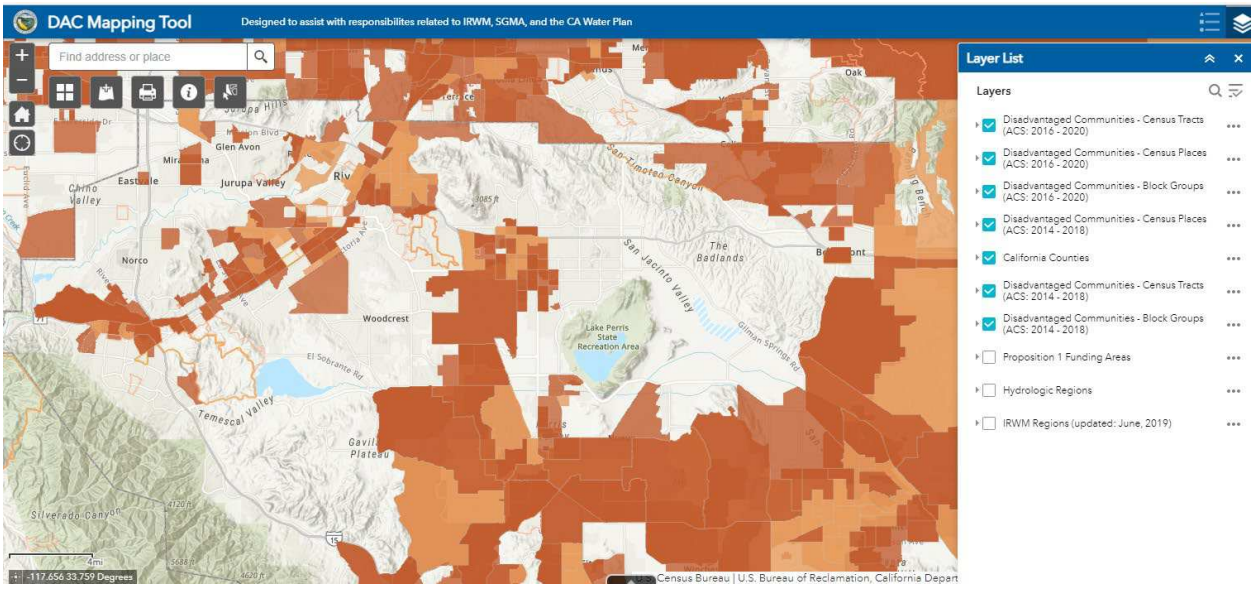
Additionally, part of Western's Water Shortage Contingency Plan includes the implementation of Drought Fines for customers not meeting their water shortage targets. This financial fine is added to a customer's bill. By reducing water loss

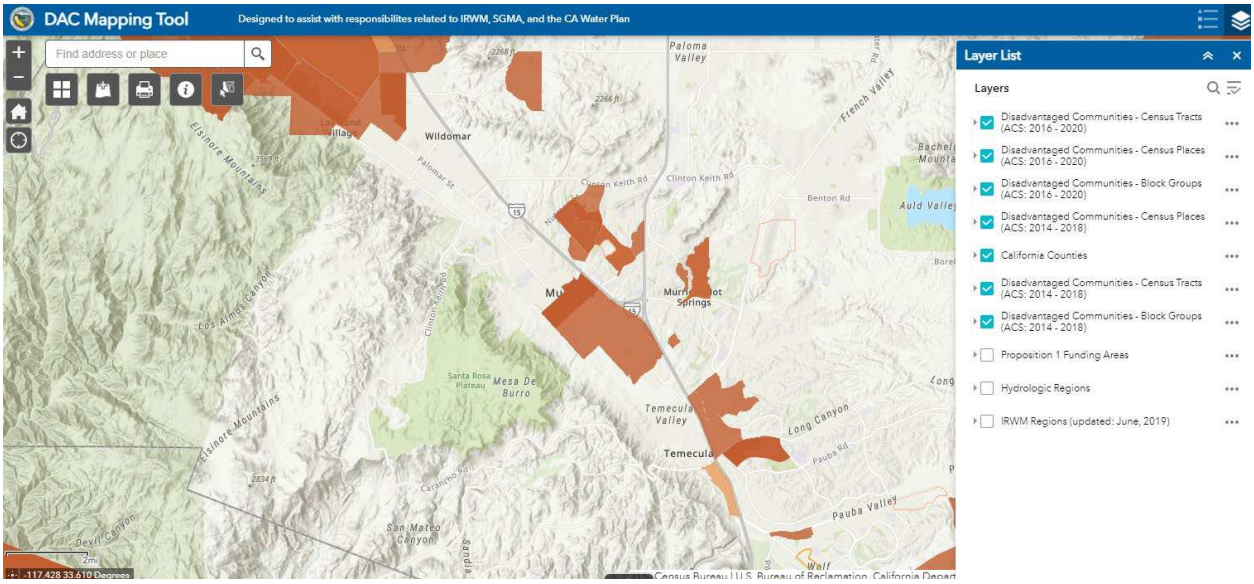
across the district, implementing the Drought Fines could be postponed. Additionally, due to the leak detection ability of the AMI and DMA, customers could be notified immediately of a leak and can respond accordingly, potentially avoiding a financial burden of an unidentified leak makes on a water bill.

> *3(2)b. If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act, which is defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State, or the applicable state criteria for determining disadvantaged status.*

Figure 2 shows that approximately 25% of Western's retail service area is defined as a disadvantaged community (DAC), whose income is 80% of the state's area median income.

Figure 2. Riverside and Murrieta DWR DAC Mapped Areas





3(2)c. If the proposed project is providing benefits to an underserved community provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

According to the United States Census (U.S. Census Bureau QuickFacts: Riverside city, California 2020), for the entire city of Riverside area over 53% of the community is Hispanic or Latino and 5.9% is Black or African American. 13 percent of that community is below the poverty line, nearly 2 percentage points more than the state's poverty line. 46% of the population speak a language at home other than English.

The Project is addressing racial equity by serving the entirety of the community. Therefore, the benefit area of the Project does include community members that do meet the underserved definition in E.O.13985, specifically a large Hispanic/Latino population and a community below 80% of the statewide annual household income.

The underserved community would benefit from this Project by having a more reliable water delivery system (less imported water being lost and more can be used for health and human services), which can help postpone this region's response to drought. Western's water shortage response ordinance does include a Drought Fine for each customer that uses excessive water use (which occurs in Stages 3 and higher). By targeting and reducing water loss, Western is able to create a buffer in our need to respond which would directly benefit the underserved community (postponing when the Drought Fine is implemented).

3(3). Tribal Benefits: The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum Tribal Consultation and Strengthening Nation-to-Nation Relationships asserts the importance of honoring the Federal government's commitments to Tribal Nations. Please address the following, if applicable:

> *3(3)a. Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?*

There are no direct Tribal benefits.

> *3(3)b. Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?*

There are no direct Tribal benefits.

3(4). Other Benefits: Will the project address water and/or energy sustainability in other ways not described above? For example:

> *3(4)a. Will the project assist States and water users in complying with interstate compacts?*

The project provides a region-wide benefit for water sustainability. It does not involve interstate compacts.

> *3(4)b. Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?*

The City of Riverside has the distinction of being the cultural, civic, educational and economic heart of the Inland Empire. The City is home to three renowned universities, a strong community college, world class healthcare, a burgeoning Innovation District and a permanently protected agricultural greenbelt, a military base, and industrial warehouses like Amazon and Burlington Coat Factory. All customer sectors will benefit directly from the project.

Local groundwater is more reliable and less expensive than imported water supply. Due to reduced water losses, businesses and communities will benefit from a more resilient water supply, less expensive water rates, and be connected to Western's Customer Portal. The Customer Portal will allow all customers access to their water consumption data and access to timely leak alerts.

> *3(4)c. Will the project benefit a larger initiative to address sustainability?*

Yes, the project benefits a larger regional initiative of Drought Contingency planning, reducing reliance on the Bay-Area Delta, and Western's Water Loss Task Force and customer engagement initiatives.

3(4)d. Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?

The Project will not directly fulfill Reclamation's legal or contractual obligations. However, Western is a member of three Watermasters in Southern California. Although not directly preventing a water-related crisis or conflict, Western is doing everything it can to be proactive in understanding its water use, getting customers to conserve, and minimizing water loss, thus enhancing local water supply reliability.

Although 2019 was a very great year for water in California, climate change points to less snowpack and more statewide droughts becoming the norm. Current water supply, where Sierra Nevada Mountain snowpack was below average and the State Water Project Allocation was also at 5%, is likely to occur again. Showing the Bay-Area Delta stakeholders that Southern Californian agencies are doing as much as they can to take less imported water and not waste water will help alleviate tensions over California's water supply. In addition, over 800 AF of water will be saved from the Bay-Area Delta, a Reclamation project, and the water will be kept at its source, helping to alleviate tensions over that water source.

By improving water supply reliability and drought resiliency, the project partners can reduce the likelihood of water-related conflicts and the need for implementing strict water use reduction measures.

D. Complementing On-Farm Irrigation Improvements

This project is not a compliment to ongoing or future on-farm improvements. However, Western does have customers with farms and nurseries. The AMI and DMA project could help these farms reduce the amount of water they consume by leak notification, seasonal customer information and reports, overall education for the customer on their usage and trends.

E. Planning and Implementation

Subcriterion E.1 – Project Planning

1.a. Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study? Please self-certify or provide copies of these plans where appropriate to verify that such a plan is in place. Including a specific excerpt or a link to the planning document may also be considered where appropriate. Provide the following information regarding project planning:

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

Western maintains numerous planning documents addressing water shortages and conservation alternatives including:

- 2020 Urban Water Management Plan (UWMP)
- SAWPA OWOW Integrated Regional Water Management Plan (IRWM)
- Western Water Conservation Ordinances and Water Shortage Contingency Plan (WSCP)
- Western Water Use Efficiency Master Plan
- Regional Drought Contingency Plan (DCP)

1.b. 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).

a) 2020 Urban Water Management Plan (UWMP)
   i. The Project is in alignment with the Western's latest UWMP that focuses on Best Management Practices for metering in association with water conservation and water management.
   ii. The Project meets the goals for Western's initiative to reduce reliance on the delta.
   iii. www.wmwd.com/uwmp
b) SAWPA OWOW Integrated Regional Water Management Plan (IRWM)
   i. The Project meets the region's objective to increase local reliability and identifies "Water Use Efficiency" Programs as high priority projects for the Region.
   ii. OWOW 2.0 Plan - SAWPA - Santa Ana Watershed Project Authority
c) Western Water Conservation Ordinances and Water Shortage Contingency Plan
   i. The Project meets Western's current water conservation ordinances designed to encourage and promote water conservation. Quickly identifying leaks is a required response action throughout the water conservation ordinance.
   ii. www.wmwd.com/wscp
d) Western Water Use Efficiency Master Plan
   i. The Project is listed as a project in the Water Use Efficiency Master Planning effort.
   ii. https://www.wmwd.com/DocumentCenter/View/4732/WUEMasterPlan1-25-19
   iii. Customer Portals and putting data in the hands of the customers is a large component of this planning effort.
e) Drought Contingency Plan
   i. The Project is listed as a mitigation project in Western's DCP providing water conservation and water reliability benefits.
   ii. www.wmwd.com/uwmp

Subcriterion E.2— Readiness to Proceed

2.a. Identify and provide a summary description of the major tasks necessary to complete the project.

Tasks/Milestones - Project activities and project schedule are described below.

Task 1 – Project Management

Western staff will oversee the contractors hired for the Project. A contractor will be hired to complete grant management.

Task 2 – Environmental Documentation/Permitting

Western has two prior phases of project implementation of AMI projects and meter installation. Western has determined that activities of the Project do not constitute a "project" under the California Environmental Quality Act (CEQA). This project will qualify for a categorical exclusion under the National Environmental Policy Act (NEPA) and does not involve ground-disturbance. Western 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 – Contracting

Phase 3 and the DMA project is a public works project. Western will have to publicize a bid document and award the contract to the lowest responsive bidder. Phase 3 and DMA projects will be bid separately. For Phase 3, this grant application uses actuals costs from Western's Phase 2 project budget, and the budget may need to be revised based on which vendor is awarded the work. The DMA budget is based on similar historical Western purchases. However, there is no concern among staff that the project costs will still exceed the required 50% cost share requirements. Project bidding, for construction and project management activities, will begin in the Fall of 2022.

Task 4 – Phase 3 AMI and DMA Construction and Project Management

Phase 3 meter replacements will purchase and install 1,835 meters throughout the cities of Riverside and Murrieta. 2 Mag meters will also be installed for two of Western's DMA project locations.

In addition, Western will track project progress and conduct oversight to ensure successful project implementation. Western will also perform regular reporting in compliance with the Bureau funding agreement.

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

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 Western's authority.

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

Design work is complete and Table 1 provides the quantity and type of AMI meters to be installed. Western's DMA Implementation Plan is also attached.

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

There are no new policies or administrative actions required to implement the project.

Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation Regional or Area Office?

The expected timeline for environmental and cultural compliance has not been discussed with the local Reclamation Regional or Area Office. Western has been awarded Reclamation grant funds for Phase 1 and 2 and Phase 3 follows the same environmental compliance assumptions.

Table 2. Phase 3 Project Implementation Schedule

	Task	Begin Date	End Date
1	Project Management	12/1/2022	08/1/2025
2	Environmental Documentation/ Permitting	03/1/2022	05/1/2023
3	Contracting – Phase 3	12/1/2022	03/31/2023
4	Phase 3 Construction and Project Management	05/1/2023	05/1/2025

F. Collaboration

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

Western is the retail water purveyor for the Riverside and Murrieta service areas and is authorized to implement the project within those areas. Western will notify customers of the improvements to their meters in order to inform them on the project purpose and overall implementation plan. However, as part of the Santa Ana Watershed, AMI is a practice highly supported by the Santa Ana Watershed Project Authority and the member agencies. In addition, Western is surrounded by agencies it wholesales to, such as Rancho California Water District (RCWD) and Elsinore Valley Municipal Water District (EVMWD), both of whom have AMI systems and customer portals in place. With the project, Western's customers will now have similar services as their neighbors. This will help spread the message about water conservation and available rebate programs. It will even allow

flexibility in conservation messaging and coordinated efforts among the local agencies.

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

Yes, there is widespread support for this project. Water savings, improved leak detection and reduced metering inaccuracies can all result in lower water bills. Public outreach for Phase 1 and Phase 2 of AMI implementation had customer support. Therefore, it is anticipated that customers will support and cooperate with this project.

The Project is also described in Western's Regional Drought Contingency Plan. Western actively engaged with diverse stakeholder groups throughout the development of the DCP. Western recruited, convened, and engaged a Drought Task Force comprised of 29 organizations represented by knowledgeable community leaders who can offer diverse, informed perspectives to support effective drought contingency planning. The members of the Drought Task Force organized by stakeholder segment groups are presented the DCP. All retail water agencies in Western's service area are represented on the Drought Task Force. 14% represent environmental and conservation groups, 3% represent environment and social justice, 7% represent regional government, 7% represent research, 3% represent local government, 17% represent Western's retail stakeholders, 4% represents a Tribal stakeholder, 10% represent regional water agencies, and 34% agencies in Western's service area.

3. What is the significance of the collaboration/support?

Western started our AMI journey in 2019. At that time, Western met with Rancho California Water District (a local retail agency) to learn about their experiences implementing AMI and used their insight to develop their AMI outreach plan. In addition, many of the nearby water agencies already have AMI meters in their service areas. These agencies speak highly of AMI and their support of AMI lends to great support for Western staff when speaking with their customers. Through implementing Phase 1 and Phase 2, Western has seen the benefits of AMI. Phase 3 brings all remaining customers to AMI, creating equity in Western's service area.

Through Western's System Optimization Planning Process, DMA areas were brought up to show a best practice for water utilities to address water loss.

Western held 4 interactive workshops for the Drought Task Force to develop Western's DCP. Early on, the discussion was about how integrating data and responsible use of water were priority topics for the region. These discussions led to the inclusion of the Project in the mitigation project section.

4. Will this project increase the possibility/likelihood of future water conservation improvements by other water users?

The benefits of AMI and a customer portal are known throughout water agencies as a best practice. The concept of connecting AMI to DMAs is new and not widely implemented. This gives Western the ability to document water savings and provide that information and presentations to other water users throughout the region.

5. Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).

See also 3 attached letters of support for this project from SAWPA, RCWD, and EVMWD (Attachment B).

G. Additional Non-Federal Funding

$$\frac{Non-Federal\ Funding}{Total\ Project\ Cost} = \$733{,}763 / \$1{,}438{,}751 = 51\%$$

H. Nexus to Reclamation

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

1. Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?

No, the applicant does not have a water service, repayment, or O&M contract with Reclamation. As a Metropolitan Water District of Southern California member agency, Western receives water from Reclamation's Colorado River Project.

2. If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?

Reclamation is an owner and operator of the State Water Project. Approximately 70% of Western's water is imported from the State Water Project, which is sourced from the Bay-Area Delta. The AMI project will have considerable reduction of water usage due to the real time data, alerts of customer water leaks, educational reports for District use as well as customer use, and identifying water loss throughout the distribution system. This will lead to a reduction in water diverted for SWP; which directly related to the CALFED Bay-Delta Program.

3. Will the proposed work benefit a Reclamation project area or activity?

As a Metropolitan Water District of Southern California member agency, Western receives water from Reclamation's Colorado River Project. The Project is neither on Reclamation lands nor does it involve Reclamation facilities. The Project will not contribute water to a basin where a Reclamation project is located. Western's application for a WaterSMART Water and Energy Efficiency Grant for fiscal year 2020 was accepted for a project upgrading customers to "smart" meters and adding radio towers for collection of the meter reads. Western's application for a WaterSMART Small-Scale Water Efficiency Grant for fiscal year 2021 was accepted

for a project upgrading Western's SCADA system. Both these projects occur in the same basin as the Project.

4. Is the applicant a Tribe?

Western is not a Tribe.

1.5. Performance Measures

Western realizes the importance of quantifying results to evaluate the Project's performance. Evaluating AMI and DMA Project metrics is an important means of determining the relative effectiveness of this water conserving strategy.

It is the goal of the Western to fully evaluate the benefits and capabilities of the AMI and DMA technology by establishing a set of key performance measures to quantify the Project benefits. These performance measures are preliminary and will be further evaluated and refined throughout the planning and implementation stages of the Project.

Western will use the following performance measures to evaluate the performance of the Project:

AMI

Due to existing growth and construction in the Project area, accurately gauging the effectiveness of the AMI implementation will require analysis of individual accounts in the Project area to quantify reduction in water demand and determine AMI effectiveness. Historical consumption data prior to AMI implementation will be compared with consumption data after AMI implementation. Favorable changes in observed water demand patterns will quantify the overall success of the AMI implementation.

DMA

Western will perform water loss audits using American Water Works Association methodology and review water usage reports for the Project implementation service area to ascertain the reduction in water losses and unaccounted-for water that has been recuperated. Western will also track DMA area leaks identified and the time it takes to stop and repair the leak.

It is the goal of the Western to equip employees with the necessary tools to not only monitor water production and consumption but to also analyze and evaluate solutions for minimizing water losses and increasing water use efficiency. Similarly, it is the goal of Western to provide tools and resources to the customers so that they can comprehensively understand their water usage patterns and have access to regular feedback on the effectiveness of any activities and efforts to reduce water usage in their homes and businesses.

2. Project Budget

2.1. Budget proposal

Table 3 shows the summary of the non-federal and federal funding sources and Table 4 shows the total project cost. The non-federal cost share is 51%. The budget proposal does not include any project costs that will be incurred prior to Project award.

Table 3. Summary of Non-Federal and Federal Funding Sources

Funding Sources	**Amount**
Non-Federal Entities	
1. Western Municipal Water District	$733,763
REQUESTED RECLAMATION FUNDING	**$704,988**

Table 4. Total Project Cost Table

Source	**Amount**
Cost to be reimbursed with the requested Federal Funding	$704,988
Cost to be paid by the applicant	$733,763
Value of third-party contributions	$0
Total Project Cost	**$1,438,751**

2.2. Budget narrative

Salaries and Wages

Most of the project work will be conducted by specialized contractors. For this reason, Western will not be seeking reimbursement for staff time spent on the project. It is anticipated that $25,856 of Western staff time will be spent managing the project.

Fringe Benefits

Fringe benefits are not included in the overall project budget.

Travel

Western staff anticipate visiting the project site periodically during project implementation, but this travel would be part of normal staff activity and no reimbursement or match for staff travel is being sought. It is not anticipated that there will be travel required by the consultant/contractor. However, if there is, those costs would be captured within the "contractual" budget category with any consultant/contractor cost estimates.

Equipment

Western is using documented costs from Ferguson Waterworks for the cost of the AMI Phase 3 meters. Approximately $1,105,846 is the estimated costs for purchasing the hardwire for the project. Table 5 breaks down the costs by meter size. The costs for purchasing the equipment for the District Metered Areas will be under contractual costs.

Table 5. Total Equipment Costs

Hardware	Count	Average Unit Cost	Total
5/8" Registers	166	$153	$25,390
5/8" T-10 Meter	201	$326	$65,456
3/4" T-10 Meter	1001	$343	$343,638
1" T-10 Meter	293	$422	$123,501
1.5" T-10 Meter	48	$672	$32,248
2" T-10 Meter	65	$911	$59,234
2" Mach10 Meter	16	$1,389	$22,216
3" Mach10 Meter	15	$3,298	$49,469
4" Mach10 Meter	17	$4,177	$71,010
6" Mach10 Meter	4	$6,909	$27,637
8" Mach10 Meter	5	$10,352	$51,760
10" Mach10 Meter	1	$12,882	$12,882
12" Mach10 Meter	3	$15,420	$46,259
Lids	1683	$71	$120,308
Bolts for 1.5" and larger	167	$13	$2,178
		Contingency	$52,660
Total			**$1,105,846**

Materials and Supplies

All materials and supplies will be purchased by the contractor.

Contractual

The contractual work will be performed by a contractor. The estimated contractual work is based on Western's historical experiences doing AMI Phase 1 and 2 and other District Metered Area projects. Two contractors will be selected through Western's procurement procedures. One contractor will install the AMI Phase 3 work.

$120,000 is the estimated cost to implement the District Metered Area Implementation Plan. The remaining $187,049 budgeted costs is the estimated costs for the AMI Phase 3 contractor to install the equipment.

Western staff have no concerns that there will be large changes to the budget and believes that if awarded, any changes will not result in the project costs paid by Western becoming less than 50%.

Other Expenses

No other expenses are included in the budget.

Indirect Costs

No indirect costs are included in the budget.

2.3. Funding plan and letters of commitment

Monetary contributions will come from Western funds, including proceeds from Conservation Penalty Revenue, and from operating reserves of the Riverside Potable Water Operating Fund and Murrieta Water Operating Fund. No funding will be provided by a third party. No funding has been requested or received from other Federal partners for the Phase 3 project. There are no other outstanding funding requests for the project.

3. Other Application Elements

3.1. Environmental and Cultural Resources Compliance

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

The project will consist of replacing existing water service meters, which will not result in ground-disturbing work. As a result, the project will not impact the surrounding environment.

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?

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

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 proposed project may have.

There are no "waters of the United States" located within the project boundaries and the project will not have any impacts on any nearby wetlands or surface waters.

When was the water delivery system constructed?

Western's Riverside Service Area dates to the mid-1950s.

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

The 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.

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.

There are no buildings, structures or features within the project area that are listed or eligible for listing on the National Register for Historic Places.

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

There are no known archaeological sites within the project area. Additionally, the project will occur within already developed areas and would not affect potential archeological sites.

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

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

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

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.

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

The project is not anticipated to contribute to the introduction, continued existence, or spread of, noxious weeds or non-native invasive species. No ground disturbing work will occur as part of the project, which could contribute to spreading invasive species.

3.2. 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 Western's authority.

3.3. Letters of Support

Letter of Support from the following agency is included in Attachment B.

- Santa Ana Watershed Project Authority (SAWPA)
- Rancho California Water District (RCWD)
- Elsinore Valley Municipal Water District (EVMWD)

3.4. Official Resolution

The attachments section of this application submission contains a resolution that meets the requirements of this FOA. The resolution states the identity of the official with legal authority to enter into this agreement. The resolution verifies that an appropriate official has reviewed the application submitted. The resolution states that Western has the funding specified in the funding plan. Lastly, the resolution states that Western will agree to work with Reclamation to meet established deadlines for entering into the grant agreement.

The Board of Directors of the Western Municipal Water District adopted Resolution 3238 authorizing Western to apply for a WaterSMART grant, to execute a cooperative agreement with Reclamation for implementation of the project and verifying Western's funding capability at its meeting on July 20, 2022. Resolution 3238 is provided in Attachment A.

3.5. Conflict of Interest Disclosure

There is no actual or potential conflict of interest at the time of submission.

3.6. Uniform Audit Reporting Statement

Western did not have to submit a Single Audit Report for Fiscal Year 2020-2021.

3.7. Certification Regarding Lobbying

This application requests more than $100,000 in Federal funds, therefore the Authorized Official's signature on the appropriate SF-424, Application for Federal Assistance form also represents the entity's certification of the statements in 43 CFR Part 18, Appendix A.