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## ADVANCED METER REPLACEMENT PROJECT

Funding Opportunity Number R21AS00300

**Replace Propeller Meters Having Analog Readouts  
with New Meters having Automated Meter  
Reading Capabilities**

*Eligible Project Category: Section C.3.1 Irrigation Flow Measurement*

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## EXECUTIVE SUMMARY

March 8, 2021  
Lake Chelan Reclamation District  
Manson, WA  
Chelan County

The Lake Chelan Reclamation District (District) is a Federal Irrigation District who also provides drinking water and wastewater collection services for the town of Manson. LCRD is submitting this WaterSMART grant application to seek financial assistance for its plan to replace approximately 1,066 old propeller-style water meters currently beyond their 15-year expected operating life. The new meters will be equipped with digital register that will have a cellular transmitter that sends the information to the cloud. The office will be able to access a web browser which records all real time water use data and will send out leak notifications. This Automatic Meter Reading System (AMR) meter replacement and upgrade project will result in improved water management through increased water measurement accuracy and efficiency and will save labor and reduce fuel costs by eliminating the need to visit each meter location (we manually read meters every two months). The granted funds would be used to purchase and install the new meters and transmitters, using existing District staff. The replacement of the District's meters is identified in *Section 5.1.7.5* of the District's *2021 Comprehensive Water Conservation Plan*, as a primary opportunity to increase water measurement accuracy and conserve energy. The District plans to implement the project over the course of five years, with an estimated completion date for this phase (550 meters) of *June 30, 2022*. The remaining meters will be replaced in future years under a separate project.

The District is a federal reclamation project within the Chief Joseph Dam Project of the United States Bureau of Reclamation's (Reclamation) Pacific Northwest Region. This grant application is submitted pursuant to Funding Opportunity Announcement Funding Opportunity Number R21AS00300, Section C.3.1: Irrigation Flow Measurement.

## BACKGROUND DATA

### *Description of the District*

#### **General Information and History**

The Lake Chelan Reclamation District (District) is located in Chelan County, Washington. The District serves lands from the community of Manson to the City of Chelan on the north shore of Lake Chelan. The District was formed in 1920 by acquiring the assets of the Lake Chelan Water Company. Assets at the time included approximately 6,860 acres of land, of which 4,359 were classed as irrigable but only 1,198 of those acres were being irrigated at the time. The assets also included a 14-mile collection system from Big Grade Creek to the Antilon Reservoir (no longer in use) and a partially completed distribution system and the Wapato Lake Reservoir.

The domestic water system in the town of Manson was originally constructed and privately owned by J.R. Laycock sometime around 1910. Negotiations between the District and Mr. Laycock to purchase the system began in May of 1920 with a final settlement price of \$2,289 being paid in February of 1922.

The District made many improvements and expansions to the system between 1922 and 1971. A study undertaken in October 1971 indicated that the Manson Intake was at capacity to meet peak

daily demands with no capacity for fire flows during peak demand periods. The two 400 gallon per minute pumps would run nearly continuously for 24 hours and the 150,000 gallon reservoir had no storage for fire flows during July and August. Much of the distribution system was undersized for providing fire flows with many dead-end lines.

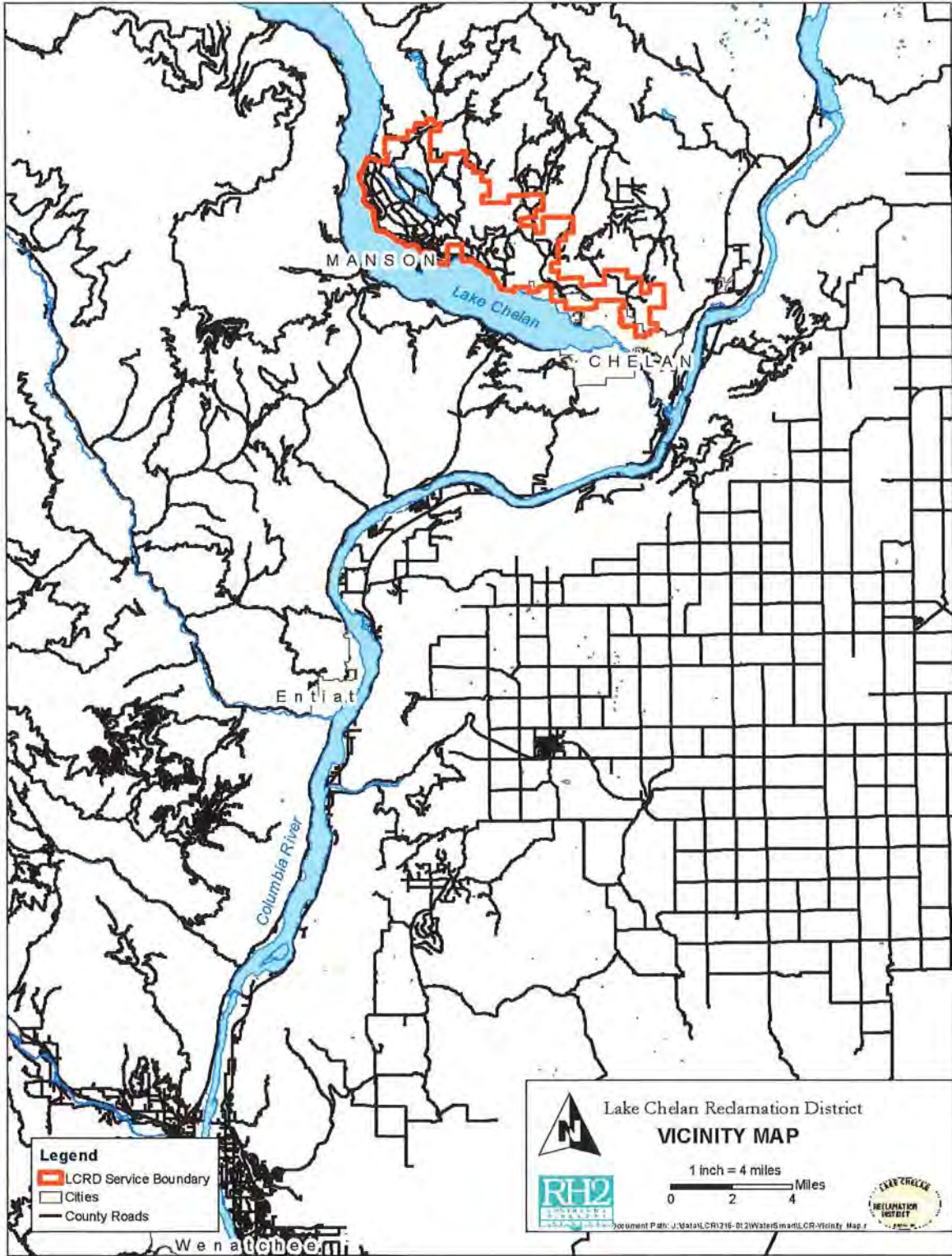
The rebuilding of the irrigation system in 1971-1975 gave the District an opportunity to lay several miles of domestic water lines to the rural areas in the same trench as the irrigation distribution lines under construction. District crews were utilized to accomplish this task and in doing so expanded the service area quite significantly. In 1974 the District constructed a second domestic intake called the Lakeshore Intake. The new pump station contained two pumps with a combined capacity of 2.90 cubic feet per second. The station was located on District property that had been used historically to pump supplementary irrigation water into the old irrigation system. The District abandoned the irrigation station and used the station's 24-inch discharge line for the new Lakeshore Intake. Water was pumped through the 24-inch steel line to a new 1.0 million gallon reservoir located adjacent to Summit Avenue (the Lakeshore Tank).

In 1982 the Manson Intake was rebuilt to include three pumps with a total capacity of 6.68 cubic feet per second. A new 16-inch discharge line was installed and in 1985 the new 1.0 million gallon Manson Reservoir (now the WTP Raw Water tank) was constructed above Division Street. By 1990 over 45 miles of distribution system served customers in the greater Manson area.

In 1991, the Washington State Department of Health directed the District to begin planning for a Water Treatment Plant to filter the domestic supplies coming from Lake Chelan. Studies were undertaken to determine if it was more efficient to combine the intakes for the District with the City of Chelan and build only one treatment plant. The City of Chelan is the only adjacent Group 'A' system on the north shore of Lake Chelan. Two to five small Group 'B' systems adjoined the system and may be incorporated in the domestic system sometime in the future. Geographically, the LCRD system and the City of Chelan system would most logically meet near a rock outcrop along the lake called Rocky Point. HDR Engineering was the consulting engineer for both the LCRD and the City and analyzed the opportunity to build either one treatment plant for both the LCRD and the City or one treatment plant for each entity. It was determined to be more cost effective to build a plant at each location. In 1997, construction began on a four million gallon per day treatment plant together with pipelines and other appurtenances to bring untreated water from both the Manson Intake and the Lakeshore Intake to the treatment plant located near the Manson Reservoir. Construction included a new 1.25 million gallon finished water reservoir. Total cost of the project completed in 1999 was \$7.4 million dollars.

Beginning in 2004 and finishing in 2005, the Manson Intake and Lakeshore Intakes were rehabilitated to meet the construction obligations outlined in the expanded water right permits obtained in 1995. The Manson Intake was upgraded by replacing two pumps (No. 1 and No. 2) and motors, the motor control center, pump control valves, and discharge piping from the intake. The Lakeshore Intake was upgraded by replacing the pump and motor for pump No. 2, the motor control center and several control valves. This project increased the pumping capacity of the Manson Intake to a capacity of 9.25 cubic feet per second and the Lakeshore Intake to a capacity of 4.68 cubic feet per second with a grand total of 13.93 cubic feet per second. In 2018 the Manson Intake pump No. 3 failed and was replaced in 2019.

# PROJECT LOCATION





## PROJECT DESCRIPTION

### *Flow Meter Conversion and Upgrades*

Similar to many Central Washington water systems, a significant portion of the domestic water is used for irrigation purposes. Most passes through the customers' domestic water meter and is not separately metered. Upon the payment of an annual "Irrigation" assessment, domestic water users are provided with an additional allotment of water to be used from April 1 to October 15<sup>th</sup>.

The District is in the process of adopting the current *Comprehensive Water Conservation Plan (WCP)*. The following are excerpts from Chapter 5 of the WCP describing the District's long-range plans regarding flow meters:

#### 5.1.7.5 Install an Automated Meter Reading (AMR) System.

An AMR system will allow the District to read meters consistently and eliminate the times where snow prevents regular reads in the winter, thereby providing earlier opportunities to identify customer leaks. Read periods could also be shortened for larger customers to better profile their water use, and for customers with suspect leakage.

**Status:** The District has begun installation of meters that communicate back to the office by cell service. The system being used also provides a web-based portal for customers to access their meter information at any time.

**Cost to District:** Estimated \$400,000 over about 10 years. The District will apply for a grant to help with funding.

**Shared Cost:** See the summary above for the measure "Review Bills for Abnormal Use".

**Societal Cost:** Driving mileage for meter reads may be modestly reduced depending on the meter transmission distance but should not be assumed. Less time spent reading meters may free up staff to address other customer needs.

The District has a total of 2,502 metered connections within our District. We have identified 1,066 older residential "propeller-style" meters that are a considerable source of inaccurate water measurement, continually under-registering the amount of water delivered, and thus under billing the water users which leaves the District short on funding. In addition to those, we also have 6 – 6" Commercial Meters, 6 1-1/2" Meters, and 9 2" meters that also need to be upgraded.

We currently have 259 AMR Meters already installed within our system that we have been monitoring for the last year as a test run with great success. The District has budgeted to replace an additional 550 more meters within the next year and then another 550 meters within the following year.

Besides being more accurate than the existing meters, the AMR transmitters can transmit data by cellular radios, where it can be read by at the District Office via a web browser. The town of Manson has a large majority of vacation rentals and seasonal homes. Having AMR transmitters will notify these homeowners of a leak without waiting for a large excess bill or waiting to find water damage.

The District has already acquired the software and necessary to read and record the meter data. This will provide an immense labor savings compared to the current situation where an employee must visit each meter location every other month. After the meter replacement is complete, daily meter

data will be available at the click of a button. This provides a significant decrease in labor and will also eliminate most of the 200 miles of driving now required to visit each meter location.

Each meter will be replaced with a Badger Recordall 5/8" by 3/4" Meter. These meters will totalize in cubic feet per minute or gallons per minute. The meter does not require an external alternating current (AC) power source. This capability is necessary because very few of the meters currently have AC power. The District has selected these Badger meters because they are field programmable, and battery powered.

Each meter will be capable of being equipped with a Badger Meter ORION transmitter. This cellular transmitter broadcasts the meter data that has been encoded by the Absolute Digital Encoder directly to the Badger website. This transmitter is battery powered and operates in a band width that does not require a Federal Communications Commission (FCC) radio license.

Replacing these meters will result in water better managed through increased efficiency and measuring accuracy.

## E.1 TECHNICAL PROPOSAL EVALUATION CRITERIA

### **E.1.1. Evaluation Criterion A—Project Benefits (35 points)**

*Up to 35 points may be awarded based upon evaluation of the benefits that are expected to result from implementing the proposed project. This criterion considers a variety of project benefits, including the significance of the anticipated water management benefits and the public benefits of the project. This criterion prioritizes projects that modernize existing infrastructure to address water reliability concerns, including making water available for multiple beneficial uses and resolving water related conflict in the region. Planning Efforts Supporting the Project (35 points)*

- **What are the benefits to the applicant's water supply delivery system?**

This meter replacement project will result in water better managed through increased measurement accuracy and operational efficiency and save labor and reduce fuel costs by eliminating the need to visit each meter location. The primary benefit to the District is improved water management. The upgraded metering system with improved accuracy and automatic reading capabilities will allow the District to better quantify leakage and over-deliveries. New propeller-style meters typically have an accuracy of +/- 2 percent (source: Badger Meters, Inc.), while the District as estimated accuracy of +/- 8 to 10% within the existing meters, the new meters will be a four-fold increase in measurement efficiency over existing conditions. In addition, the ability to frequently review up-to-date metering data will allow the District to identify inefficiencies or other issues quickly so the District can respond appropriately.

- **If other benefits are expected explain those as well. Consider the following:**

The Districts AMR Project will achieve water savings by implementing more rapid identification and correction of water leaks. Currently meters are read every 2 months, allowing leaks to go undetected and water to be wasted for 2 months before being noticed. The new AMR meters will provide readings every 4 hours. This will enable the auto the automated software and the District staff to identify leaks real-time, such as higher than normal minimum night flow. The software will notify both the District and the customer of potential leaks and the volume of the potential water loss and then the District staff will work with the customer to inform them of

the amount of potential water losses. Educating the customers on their actual water usage will reduce potable water use.

By implementing AMR meters, it will save four employees from reading meters over four days, every other month for a total of 768 hours per year. District's meter readers drive about 40 miles per month to read meters, reread meters and check the leak indicators for inquiring customers. That works out to about 160 miles per month or 1,920 miles during the 6-month billing cycle. At a cost of \$0.56 per mile, this vehicle expense equates to about \$1,075 per year. This driving time and vehicle expense will be nearly eliminated once the entire AMR meter replacement and upgrade project is completed. The system will also allow our customers to view their meter reads, use and sign up for leak alerts all on their mobile devices.

### **E.1.2. Evaluation Criterion B—Planning Efforts Supporting the Project (35 points)**

Up to 35 points may be awarded based on the extent to which the proposed on-the-ground project is supported by an applicant's existing water management plan, water conservation plan, System Optimization Review, or identified as part of another planning effort led by the applicant. This criterion prioritizes projects that are identified through local planning efforts and meet local needs.

- *Describe how your project is supported by an existing planning effort. Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?*

The District has recently completed its WCP here in 2021. Section 5.3 identified a goal to replace all existing meters that are past their usable lifespan with new AMR meters. That section of the WCP is reprinted in the opening pages of the PROJECT DESCRIPTION section. This AMR meter replacement and upgrade project will directly implement the goals of Section 5.3 of the District's 2021 WCP.

- *Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/asures.*

The WCP identified various other opportunities for improvements in addition to the District-wide programmatic meter replacement effort, but they consist of significant infrastructure upgrades. Currently meters are read every two months allowing leaks to go undetected and water to be wasted for two months before being noticed. This reflects an easily achievable, but relatively high-payoff project that can readily be implemented and that will immediately result in benefits to the District. Upfront effort is relatively low compared to the more significant infrastructure upgrades also included in the WCP, as engineering and design efforts are minimal, and the meters can be replaced with in-house labor and without onerous permitting.

### **E.1.3 Evaluation Criterion C — Project Implementation (10 points)**

Up to 10 points may be awarded based upon the extent to which the applicant is capable of proceeding with the proposed project upon entering into a financial assistance agreement. Applicants that describe a detailed plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.



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

The District is currently capable and prepared to immediately start replacing meters. The District has included \$75,000 in both our 2021 and our 2022 Construction Budget intended to be a 50 percent cost share for implementation. These funds are intended to enable the following implementation schedule:

○ August 2021	.....	Notice of award (assumed)
○ September 2021	.....	Funds awarded (assumed)
○ October 2021	.....	Order meters and parts
○ December 2021 thru May 2022	.....	Install meters
○ June 2022	.....	Project completion

\*These dates can be accelerated if funds are awarded earlier.

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

No permits are required. This project changes out existing plumbing components within existing facilities, all within existing facility footprints. Therefore, no environmental permits, local planning department permits, or building permits are anticipated.

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

The District will perform all of its own engineering work on this project if necessary.

- *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.

#### **E.1.4 Evaluation Criterion D — Nexus to Reclamation (10 points)**

*Up to 10 points may be awarded based on the extent that the proposal demonstrates a nexus between the proposed project and a Reclamation project or activity. Describe the nexus between the proposed project and a Reclamation project or activity, including:*

*Is the proposed project connected to a Reclamation project or activity?*

- *Does the applicant receive Reclamation project water?*
- *Is the project on Reclamation project lands or involving Reclamation facilities?*
- *Is the project in the same basin as a Reclamation project or activity?*
- *Will the proposed work contribute water to a basin where a Reclamation project is located?*
- *Will the project benefit any tribe(s)?*

The District’s Federal Irrigation facilities are part of Reclamation’s Chief Joseph Project and was authorized by Congress in 1966. The District is within Reclamation’s Pacific Northwest Region, Columbia-Cascades Area Office, Ephrata Field Office. A majority of the District’s facilities were planned, designed, and constructed by Reclamation, and title to most of those facilities are held by the United States. However, the domestic water system is owned by the District and most all pipelines run in county right of ways or within easements that

benefit the District. The District and its water supply are within the Columbia River basin. The project is not expected to affect Reclamation's trust responsibilities to any Tribe(s).

## ENVIRONMENTAL AND CULTURAL RESOURCE COMPLIANCE

This AMR meter replacement and upgrade project will be changing out meters in existing facilities. All work will be within the existing footprints of existing facilities. No excavations or other site disturbances are anticipated. No local planning department or building permits will be required. As will be covered in the responses to the following questions, there will be no applicability of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Endangered Species Act (ESA), or other federal or state environmental laws.

***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.***

No. This project will be changing our meters within existing pipe systems. Meters are located in existing shallow boxes. There will be no excavation or other site disturbance.

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

There are no anadromous fish in Lake Chelan and no threatened or endangered species in the lake. There are species of salmon and steelhead within the Columbia River downstream the District's area that are listed as "threatened" under ESA. The District's operations are covered under an ESA Section 7 consultation known as the Federal Columbia River Power System Biological Assessment. The District's ESA coverage thereunder is pursuant to Reclamation's coverage. This AMR meter project will take place away from the river and will not affect any endangered species.

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

Yes, there are both surface waters and small wetlands within the general project boundary. However, the project will not disturb any soil and not impact these waters/wetlands in any way.

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

The domestic water system in the town of Manson was originally constructed and privately owned by J.R. Laycock sometime around 1910. Negotiations between the District and Mr. Laycock to purchase the system began in May of 1920 with a final settlement price of \$2,289 being paid in February of 1922.

***Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., head gates, canals, or flumes)? If so, state when those features were***

*constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.*

No. This AMR meter project will be changing meters within existing pipe 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.*

None will be affected since this project will be changing meters within existing pipe systems.

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

Yes. However, none will be affected since this project will be changing meters within existing pipe systems.

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

There will be no effect since this project will be changing meters within existing pipe systems.

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

No.

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

No. There will be no excavation or other soil disturbance.

## REQUIRED PERMITS OR APPROVALS

This AMR meter replacement and upgrade project scope is limited to changing out meters in existing facilities. This project is simply changing plumbing components. All work will be within the existing footprints of existing facilities. No excavation or other site disturbances are anticipated. No local planning department or building permits will be required.

An Official Resolution to perform the work is attached as Appendix A.

## PROJECT BUDGET

### *Funding Plan and Letters of Commitment*

The District will fully fund the non-federal share of project costs of \$82,160 which is included in its 2022 Budget as a monetary contribution to the cost-share requirements. The District is fully capable of supporting these costs within its existing budget. No third-party funding sources or letters of commitment are required. No costs incurred before the project start date are sought to be included as project costs. No other Federal funding will be utilized, and no other pending funding requests exist for this project.

Table 1 – Summary of Non-federal and Federal Funding Sources

Funding Sources	Amount
Non-federal Sources	
Lake Chelan Reclamation District	\$82,160
Sub-total Non-federal Sources	\$75,000
Other Federal Sources	
None	0
Sub-total Other Federal Sources	0
<b>REQUESTED RECLAMATION FUNDING</b>	<b>\$75,000</b>
<b>TOTAL Project Funding</b>	<b>\$157,160</b>

*Budget Proposal*

Table 2 identifies all estimated project costs. Table 2 – Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION			TOTAL COST
	\$/Unit	Quantity		
<b>Salaries and Wages</b>				<b>\$11,330</b>
Employee #1	\$25.00	220		\$5,500
Employee #2	\$26.50	220		\$5,830
<b>Fringe Benefits</b>				<b>\$9,618</b>
Employee #1	\$21.65	220		\$4,763
Employee #2	\$22.07	220		\$4,855
<b>Equipment</b>				<b>\$9,962</b>
Truck	\$22.64	440		\$9,962
<b>Construction Supplies/Materials</b>				<b>\$123,750</b>
Badger Orion-Cell-LTE KIT	\$225.00	550		\$123,750
<b>Other</b>				<b>\$2,500</b>
Reclamation environmental and cultural compliance costs				\$2,500
<b>TOTAL DIRECT COSTS</b>				<b>\$157,160</b>
<b>Indirect Costs</b>				
None				\$0



## *Budget Narrative*

The District's budgetary goal with the project is to maximize the number of meters that can be replaced for the \$150,000 project cost cap on this funding opportunity. The District will continue this program at every opportunity until all meters are replaced. The District will purchase all the meters directly. Administrative Assistant, Jennifer Collins will oversee the project from purchasing to installation. This application includes the labor, equipment, and parts necessary to complete work using LCRD staff and resources. There are no environmental and regulatory compliance costs.

### UNIQUE ENTITY IDENTIFIER AND SYSTEM FOR AWARD MANAGEMENT

The District is registered and will remain registered in the System for Award Management under the following unique identifiers: DUNS:060028008, CAGE: 4E9U1, Expiration Date: February 26, 2022.

LAKE CHELAN RECLAMATION DISTRICT

MANSON, WASHINGTON

**RESOLUTION 2021-05**

WATERSMART GRANTS

THE BOARD OF DIRECTORS OF LAKE CHELAN RECLAMATION DISTRICT HEREBY RESOLVES AS FOLLOWS:

Secretary/Manager Rodney Anderson is hereby authorized to pursue WaterSMART Grants through the U.S. Bureau of Reclamation (USBR). By adopting this resolution, the Board of Directors has designated Manager Anderson as the appropriate official to pursue these USBR grants.

The Board also confirms there will be matching funds available upon acceptance of these grants. Upon adoption, LCRD agrees to work with USBR to meet all established deadlines for entering into a cooperative agreement.

Resolved this 11th day of March 2021 by the Board of Directors.

APPROVED

By:   
\_\_\_\_\_  
President

ATTEST

By:   
\_\_\_\_\_

Secretary-Manager

LAKE CHELAN RECLAMATION DISTRICT

MANSON, WASHINGTON

**RESOLUTION 2021-05**

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By:   
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President

ATTEST

By:   
\_\_\_\_\_  
Secretary-Manager