

Red River Authority of Texas



Advanced Metering Infrastructure Program

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SECTION 1. EXECUTIVE SUMMARY

Date	April 18, 2019
Applicant	Red River Authority of Texas
AUTHORITY, County, State	Wichita Falls, Wichita, Texas
Project Name	AMI Meter Replacement Program
Project Length	1 year
Estimated Completion Date	October 1, 2020

The RED RIVER AUTHORITY OF TEXAS (the AUTHORITY), is applying for funding by the United States Bureau of Reclamation's (USBR) WaterSMART: Small-Scale Water Efficiency Projects for FY2019 Funding Opportunity Announcement No. BOR-DO-19-F005. The AUTHORITY is applying for \$75,000 in Federal funding assistance to implement an Advanced Metering Infrastructure (AMI) Program, which includes the installation of 550 new water meters with ancillary radio and computer reading equipment for residential and commercial customers, along with a new smart meter software system. Funds will be used to purchase new smart meter software and to purchase and install AMI meters and appurtenances. The purpose of the AMI Program is to increase water conservation and water use efficiency by providing real-time water consumption data to the AUTHORITY and its customers.

Water Conservation - The Project shall increase efficiency and reduce water loss and accountability for a sustainable potable water service through improved water resource management and overall system operation. This will help conserve water, and increase the financial stability and service reliability of the utility. Water conservation will be improved by increasing customer understanding of their water use compared to neighbors, and public education through water audits. Customer leaks can be identified and stopped in a matter of hours, compared to up to sixty days with the existing manual read meters. This significantly reduces water waste and property damage. A percentage of the AUTHORITY's customers are part-time residents, so leaks running for weeks while the customer is away is common place with conventional meters. Reduced water use through conservation produces a linear reduction in energy use associated with source production, conveyance, and treatment requirements.

The Project is not located on a Federal facility.

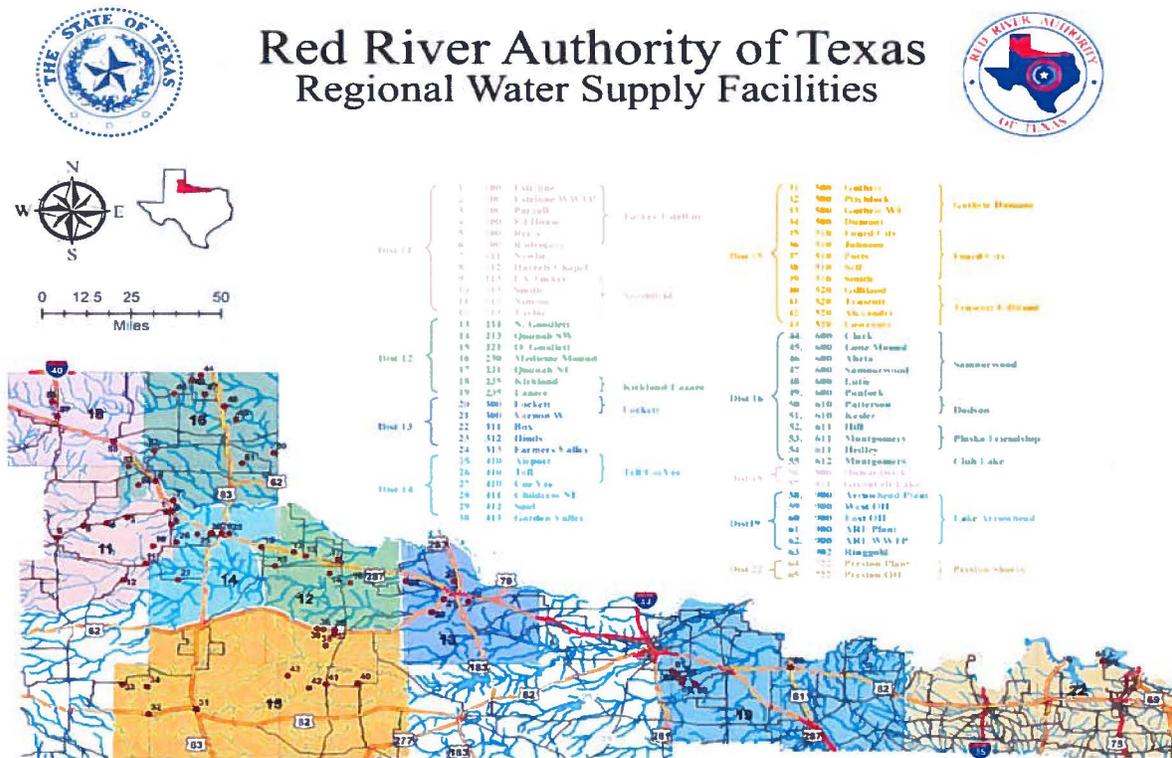


SECTION 2. BACKGROUND DATA

2.1 Location

The AUTHORITY has multiple water systems with an overall operating water service area located along northern Texas, as depicted in Figure 1. These areas are located in 15 counties of North Texas bounded Donley County on the West and Grayson County on East, with the Red River basin. In total, the AUTHORITY’s operating water service areas encompass approximately 13,000 square miles.

Figure 1 Water Service Area



2.2 Overview of Water Supply

The AUTHORITY produces potable water from groundwater wells and surface water, and purchases treated surface and groundwater. The AUTHORITY’s projected water supplies are summarized in Table No. 1. These quantities meet all state water conservation requirements. As shown, the average annual demand is 1,624 acre-feet per year (afy), and is within the safe yield of all sources.



Table No. 1 Current and Projected Demand

Supply Source	Annual Pumping (afy)					
	2020	2025	2030	2035	2040	2045
Groundwater/ Total	540	542	544	547	549	551
Surface/Total	1084	1088	1093	1097	1101	1106
Total	1624	1630	1637	1644	1650	1657

Note:
The calculations used for the demands are based on a 0.0008% growth in demand each year, beginning in 2021.

Table No. 2 Summary of the Current and Future Water Use by Customer Class

Customer Class	2020		2025		2030	
	No. of accounts	Demand (afy)	No of Accounts	Demand (afy)	No. of accounts	Demand (afy)
Single-Family	3,775	707	3,817	710	3,859	713
Multi-family	-	-	-	-	-	-
Commercial	98	351	99	354	100	354
Industrial	-	-	-	-	-	-
Government	-	-	-	-	-	-
System Losses	-	566	-	568	-	571
Total	3,873	1,630	3,916	1,630	3,959	1,637



Table No. 2 Summary of the Current and Future Water Use by Customer Class (cont.)

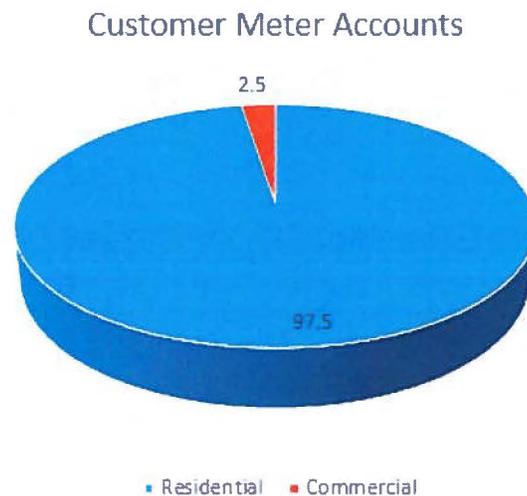
Customer Class	2035		2040	
	No. of accounts	Demand (afy)	No. of accounts	Demand (afy)
Single-Family	3,901	716	3,944	718
Multi-family	-	-	-	-
Commercial	101	355	102	357
Industrial	-	-	-	-
Government	-	-	-	-
System Losses	-	573	-	575
Total	4,002	1,644	4,046	1,650

Note:
The calculations used for the demands are based on a 0.0008% % growth each year, beginning in 2021.

2.3 Current Water Uses

As of 2019, the AUTHORITY maintains 3,873 water meters, of which 3,775 (97.5%) are residential and 98 (2.5%) are commercial. (Figure 2).

Figure 2 Customer Account Breakdown



2.4 Water Delivery System Description

The AUTHORITY distributes its potable water supply through a distribution system consisting of 33 water systems with 33 separate pressure zones, 2,150 miles of pipeline, 8 well systems, 2 surface water plants. The AUTHORITY also purchases ground water for 5 systems and surface water for 26 systems.

SECTION 3. TECHNICAL PROJECT DESCRIPTION

The AUTHORITY has 3,873 meters within its service area. Some of the meters are over 40 years old. The typical warranty on a meter is 10 years on moving parts and 20 years on the meter body.

The AUTHORITY has completed a review of the meters, and the staff determined that 1,379 meters are 20+ years old, 1,749 meters are 15-20 years old, and 745 meters are 5 or less years old. Since approximately 10% of the AUTHORITY's customers are part-time residents, it is not unusual for meters to have no usage for several months.

Based upon this water meter data, the AUTHORITY needs an AMI project to replace approximately 15 percent of the metering system, or 550 new meters and radio read technology. The AUTHORITY conducted research on five different types of meters from three different manufacturers and three different radio read systems. Upon completion of the review, the AUTHORITY has a preference to use the Sensus iPERL and Sensus 520M MXU radio system (see details in next section), however the project must be competitively bid.

3.1 The Proposed Project

Upon execution of a replacement contract, the AUTHORITY will purchase and install 550 meters in one year. The project will comply with standards established by the American Water Works Association (AWWA) for drinking water systems, and the meters will be lead free.

Selected technology:

In considering meter system options, the following items were reviewed to identify the most appropriate technology:

- Accuracy in metering water consumption;
- Ability to perform radio and/or drive-by readings;
- Ability to store historical data for consumption patterns or system deficiencies (unaccounted for water);
- Reliability of the meter in a freeze-thaw environment;
- Compatibility with the existing system;
- Cost of initial investment, as well as ongoing operations and maintenance costs;
- Training requirements.

Selected Equipment:

Meter:



Sensus iPERL composite meter. Additional information is provided in Section 4.1.

Radio:

Sensus 520M MXU SmartPoint radio transmits meter consumption information to the mobile VGB reader. This information will be downloaded the AUTHORITY's ENCODE system, and will be used to answer customer inquiries, bill the accounts, and disseminate leak alarms. Additional information is provided in Section 4.1.

3.2 AMI Benefits

The purpose of this AMI system is to better track water system demands in real time to measure effects of conservation measures. By tracking real time data of water system demands, the AUTHORITY will be able to educate customers regarding water use and also identify leaks and other areas where additional conservation may be possible.

The AUTHORITY hopes to use the AMI system to improve the following areas of conservation:

Leak Alerts -One very important benefit of improved data collection is the ability to identify customer leaks. AMI systems can detect two types of leaks. First, AMI software can be programmed to recognize large sustained increases in flow departing from normal use patterns. This is indicative of catastrophic pipeline breaks. When this type of break is detected, home or business owners can be notified in case they are away at work or out of town, allowing the customer and the AUTHORITY's staff to respond to the break as quickly as possible. This is particularly important as some homeowners are not full time residents, potentially causing catastrophic property damage and significant water loss. A second type of leak that can be identified by the AMI system is recognizing when a small amount of flow is consistently being detected at the meter. This is indicative of a small leak somewhere in the home or business, or between the meter and the building or home. In this case, the AUTHORITY can contact the resident to identify the issue and encourage the customer to investigate. In both cases, AMI can save water for the AUTHORITY and money for its customers. The EPA estimates the average household's leaks can account for more than 10,000 gallons of water wasted every year. This represents a significant area of potential conservation. In addition, once a customer reports that a leak has been repaired, the AMI interface allows staff to confirm that fact.

Time of Day Audits -In the next Water Conservation and Drought Contingency Plan, the Authority is considering implementing certain restrictions on outdoor irrigation for all water users. Evaporation has been measured in several locations in the water service area. Evaporation rates in this region can be as high as 7.9 inches of water per month. This can trigger irrigation of lawns. The AMI system has the ability to provide alerts to the AUTHORITY when water uses indicate possible irrigation occurring during prohibited time frames. Violations are generally addressed with friendly visits and written reminders to customers.

Peak Use Data -With the AMI system, it will be possible to educate customers regarding peak usage. For example, the AUTHORITY will be able to alert customers to key periods of high demand that may be indicative of water waste. By identifying peak demand periods, customers can be made aware of times of day or times of year when water is potentially being wasted.



Water Audits -In addition to time of day and leak alerts, it is also possible to identify the largest users of water on a regular basis, as well as, peak instantaneous demand basis. The new AMI system will also be able to identify the highest users by peak day and peak hour. This may help identify users that have less efficient fixtures or sprinkler systems. For those users with excessive water use, the AUTHORITY could provide information and resources to help in their efforts to save water.

Drought and Water Emergency Measures -In addition to its efforts to achieve long-term water use reductions through conservation, the AUTHORITY also has a plan for reducing water consumption in times of drought or other water emergency (such as a line break). The Drought Contingency Plan includes the restriction of water use by large users, stricter enforcement of existing AUTHORITY conservation practices, voluntary reduction of water use, with mandatory reductions of water through enforcement as a last resort. The AMI system will be capable of quickly identifying large water users in the case of a water emergency and enforcing conservation restrictions if necessary.

Texas Water Development Board Compliance – Texas State law requires each water supplier to submit a completed and validated annual water loss audit report. The addition of AMI would greatly assist the AUTHORITY in completing the annual audit, ensuring the accuracy of reads.

Usage Alerts – Approximately 10% of the AUTHORITY’s customers are part-time residents. The AMI system can be setup to notify the customer of usage during periods when they are out of town. This feature will improve the security/safety of the home, reduce property damage/loss, and reduce unauthorized water use.

SECTION 4. EVALUATION CRITERIA

4.1 Evaluation Criterion A: Quantifiable Water Savings

The AUTHORITY’s long-term water conservation goal is to reduce per capita water use by 30% in accordance with its Water Conservation Plan of 2014. This project is a critical component of the AUTHORITY’s overall conservation plan. In order to reduce the AUTHORITY’s customer water use and meet its conservation goal, the AUTHORITY needs to implement an AMI Meter Replacement program in support of the AUTHORITY’s continuing water conservation efforts. The AUTHORITY evaluated three different meter manufacturers (five different meter models) and three different radio manufacturers. The Sensus iPERL meter has the best warranty on accuracy, so it was selected. The Sensus 520M MXU radio and antenna can be mounted within the meter box, under the lid, and only requires a mobile reader to transmit real time meter information to the AUTHORITY’s computers.

The AUTHORITY’s water production for Calendar Year 2018 (CY18) is 1,624 AF/year. The water loss percentage has been 34.8%. The new AMI meters will provide the AUTHORITY real time, hourly usage information, which will assist us in identifying large and small customer leaks. The AUTHORITY will also use this information to identify large use customers and customize a conservation plan for those customers. The hourly usage data will also be used to identify customers who are irrigating outside



of the approved irrigation times and days. The AUTHORITY will educate these customers to irrigate during early morning or evening hours, which is more efficient and will ultimately allow them to reduce their irrigation times.

Lost water is either used by the customer while not measured due to an inaccurate or inoperable water meter, or has percolated into the ground after leaking from the AUTHORITY’s water distribution system or the customer’s system. The AMI meter replacement initiative will allow the AUTHORITY to locate customer leaks within hours. The new accurate meters will enable the AUTHORITY to easily identify areas where supply production quantities significantly exceed usage quantities, which will allow refining the area in which to search for a water main leak. The above measures will conserve water and reduce the amount of water the AUTHORITY pumps.

4.1.1 Sub-criterion No. A.1: Reducing Water Loss

The AUTHORITY’s AMI meter replacement initiative will reduce water loss by four different quantifiable ways, and **will result in 20.7 acre-feet per year in water savings**. 1) The AUTHORITY was concerned with the accuracy of its meters, and it is estimated under-registering of water usage is 3% of total production. 2) The AUTHORITY’s meters operate in a freeze-thaw environment that can cause the meter to become inoperable and register zero flow. The estimated unaccounted for water for non-registering meters is 3%. 3) Approximately 10% of the AUTHORITY’s customers are part-time residents. Since the AUTHORITY has a monthly billing policy, some leaks can run for thirty days or more before being discovered. The estimated unaccounted for water due to customer leaks is 2.5%. 4) Accurate metering will result in higher billing for some accounts, which will lead to a conservation response from some customers.

1. **Water Meter Accuracy:** Some of the AUTHORITY’s meters are over 20 years old and nearly 3,100 of the AUTHORITY’s conventional meters have exceeded their useful life. Concerned with the accuracy of these aging meters, the AUTHORITY conducted a review of AMI with several vendors. Based on industry testing, the AUTHORITY’s meters would be averaging 3% low. Using this accuracy data and calendar year 2018 water production quantity of 1,624 acre feet, the un-accounted water for calendar year 2018 was 49 acre feet (1,624 AF * 3%). This project would save approximately 7 acre feet per year for 550 meters, based on overall system (15% of system loss due to inaccuracy).

Table No. 3 Estimated Water Loss from Meter Inaccuracy

Acre Feet Produced	1,624
Estimated Loss	3%
Acre Feet Losses CY 2018	49

2. **Non-registering Water Meters:** the AUTHORITY estimated that 3% of its meters are inoperable. Extrapolating this percentage over the AUTHORITY’s 550 meters, there are an estimated 16 inoperable meters in our system. Assuming the estimated 16 meters were not registering flow during calendar year 2018, the non-revenue water related to stuck meters



was 7 acre feet or 3%. This extrapolates to 7 acre-feet per year for 550 meters.

Table No. 4 Estimated Water Loss from Non-registering Water Meters

Estimated # Non-registering Meters	16
Annual Water Loss (AF)	7
% of Annual Production	3%

- 3. Undetected Customer Leaks:** Approximately 10% of the AUTHORITY’s customers are part-time residents. During the winter months, many of these customers fail to properly winterize their water systems prior to leaving the house vacant for extended periods of time. A leak can go undetected for months. The AUTHORITY does not provide leak adjustments to customers who have unusually high usage due to a leak and provide proof that the leak has been repaired. The new AMI meter system will allow the AUTHORITY to identify leaks within hours, rather than days or months. The AUTHORITY calculates that 40 AF/year [1624 AF/year average water production) * 2.5% (estimated leak loss)] of water is lost to leaks. Approximately 5.7 acre feet per year can be conserved when the 550 AMI meters are deployed. The assumptions made with this calculation are that the amount of water loss before a reported leak is repaired is understated by the customers that have leaks.

Table No. 5 Estimated Water Loss from Customer Leaks

CY 2018 Water Production (AF)	1,624
Estimated Production lost to customer leaks	2.5%
Estimated Annual Water Loss due to Customer Leaks (AF)	5.7

- 4.** The un-accounted water caused by under-registering old meters or non-registering meters is calculated at 6% of the AUTHORITY’s annual water production. Even though reducing un-accounted, non-revenue water does not directly result in water conservation, it does have water conservation benefits. The new meters will accurately measure the customer’s usage and the additional 3% measured water usage may place these customers into a high usage category, resulting in additional conservation efforts by the customer. When a customer’s inoperable meter is replaced, they still use water but now it is measured. If it is assumed that 10% of customers with under-registering meters have borderline high use habits, and all of the non-registering meter customers would reduce their usage once they knew how much they used, it can be estimated that about 196 customers would likely modify their usage habits. Assuming a 20% reduction in usage once these customers were aware that they were wasting water, the possible water conserved by replacing under-registering and stuck meters is as follows:



Table No. 6 Estimated Customer Conservation in Response to AMI Metering

		Table # or Calculation	
1	# customer with under-registering meters	550 * 35.6%	196
2	Expected high-users	10% of line 1	19
3	# Customer with non-registering meters	Table No. 4	16
4	# Customers expected to modify usage	Line 2+3	35
5	Annual Consumption (CCF)	4.7 CCF*12* line 4	1,954
6	Annual Consumption (AF)	(Line 5*748)/325,851	4.5
7	Expected Annual Conservation (AF)	Line 6 * 20%	1

The new AMI meters will notify the AUTHORITY, and potentially the customer, of minor, continuous water usage that could be a leak or a faucet left on. The AMI meter can detect irrigation outside of approved irrigation times, which will result in more efficient irrigation practices. The AMI meter replacement program will allow the AUTHORITY to compare real-time water usage data with real-time water production data, for a specific area of the AUTHORITY’s service area, which will allow the AUTHORITY to identify areas of the system that have main leaks. The above features of the AMI meter replacement program will conserve water but are difficult to quantify, so they were not included in the quantifiable water saving calculation.

The total quantifiable water savings expected from the AMI meter replacement program is 20.7 acre feet per year, or 1.2% of average annual production (20.7 AF/year / 1,624 AF/year). These savings will be verified once the AMI meter replacement project is completed by comparing the current unaccounted, non-revenue water quantity, currently 81 AF/year (232 AF/year * 34.8%), to the water loss quantity after the AMI meter replacement project has been completed for one year. The AUTHORITY will also compare the average water usage before the AMI meter replacement program, to the average water usage after the AMI meter replacement project has been completed for one year.

Table No. 7 Estimated Annual Conservation

Conservation Related to AMI System	Table #	Acre Feet Conserved
Estimated Annual Water Loss Meter Inaccuracy	Table #3 (calc)	7
Estimated Annual Water Loss Non-Registering Meters	Table #4	7
Estimated Annual Water Loss Leaks	Table #5	5.7
Estimated Customer Conservation Response	Table #6	1
Total		20.7



4.1.2 Sub-criterion No. A.2: Percentage of Total Supply

As calculated above in Table No. 7, in Section 4.1.1, the Estimated Annual Conservation associated with the meter replacement program is 20.7 AF/year. The AUTHORITY's Annual Water Supply during CY 2018 is 1,624 AF/year. The estimated Percentage of Total Supply conserved is projected at 1.2%. for just 550 meters.

4.2 Evaluation Criterion B: Water Supply Reliability

4.2.1 Subcriterion: Addressing Adaptation Strategies in a WaterSMART Basin Study

Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project and how the proposed WaterSMART Grant project would help implement the adaptation strategy.

The Texas Water Development Board (TWDB) has authority that encompasses the Red River Watershed. Specifically, The TWDB is a water resources planning agency tasked with protecting the water supply in the State of Texas. The specific adaptation strategy addressed by this proposal is to reduce demand, described in the "Water Management Strategies" section of the 2017 State Water Plan. In the plan, demand management accounts for 30% of the conservation strategy which will save approximately 2.6 million acre-feet state-wide. The AMI project will directly impact demand with conservation savings as previously reported.

Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.

By implementing the AMI technology, the AUTHORITY will be able to actively monitor customer's use and utilize the customer interface to notify them when there are periods of peak demand. The AUTHORITY can then encourage customers to reduce their use and/or shift their patterns toward periods of off-peak demand. In addition, the thorough understanding of customer's daily usage patterns will allow the AUTHORITY to better manage pumping activities and reservoir levels. An added benefit to monitoring use is the ability to quickly identify potential leaks and either turn the customer's meter off, or notify them so that they can address the problem.

Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).

The Red River Authority of Texas is a participating stakeholder in Region B of the TWDB.

Describe whether the project will result in further collaboration among Basin Study partners.

By implementing the AMI technology the AUTHORITY is prepared to share the results with other TWDB member agencies and contributors. It will share its experience and would be honored to be a case study for other agencies within the watershed weighing the costs and benefits to implementing



AMI throughout their system.

4.2.2 Subcriterion: Other Water Supply Sustainability Benefits

Will the project make water available to alleviate water supply shortages resulting from drought?

This project will reduce water demand, and therefore make water available in the event of future water supply shortages.

Explain in detail the existing or recent drought conditions in the project area. Describe the impacts that are occurring now or are expected to occur as a result of drought conditions.

A prolonged drought was recently experienced throughout the Red River Basin from May 2010 to July 2015, lasting 271 weeks. The AUTHORITY has a 2014 Water Conservation and Drought Contingency Plan. System conditions are monitored, and restrictions are implemented when water production approaches the perennial yield, and the impacts are apparent in pumping operations, which triggers the plan. For the Red River basin, all reservoirs in the basin reached historic lows for pool elevation during the sustained 271 week drought. The Seymour aquifer, which is an Authority groundwater source, had modelling completed in 2011, when 2010 levels did not predicted level based on drawdown assumptions. This was when the drought began. Conservation efforts had to be increased due to available water based on the new models in the Groundwater Management Area 6 Model Runs for Seymour and Blaine Aquifers, June 2011. As a result of keen-conservation measures and community efforts, monitoring wells showed that basin management efforts have been effective and no particular sub-basins were in immediate danger of a water shortage since the end of the drought in 2015.

Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought.

The AUTHORITY's water supply conserved from the AMI Meter Replacement Program will help offset the decreased production of the AUTHORITY's wells during drought. There is also wide spread support (see attached letters of support in Section 11) for this project that helps water sustainability in the Red River Basin. Part of the AUTHORITY's service area includes rural, economically disadvantaged communities.

Will the project make water available for rural or economically disadvantaged communities?

Yes, a large portion of the AUTHORITY's water service area are rural and disadvantaged communities. The Red River Authority of Texas was created in part to provide water to under-served communities. Having the ability to actively monitor usage provides tools to help conserve water as much as possible. This will help keep the costs of water production and delivery lower. In addition, these customers will also possibly financially benefit from early leak detection and notification, also affecting affordability.



4.3 Evaluation Criterion C: Implementing Hydropower

This is not applicable to the project.

4.4 Evaluation Criterion D: Complementing On-Farm Irrigation Improvements

This is not applicable to the project.

4.5 Evaluation Criterion E: Department of the Interior Priorities

4.5.1 Subcriterion: Conservation Stewardship Legacy

The AMI meters will provide conservation stewardship for the AUTHORITY by helping to adapt to the changing environment. As described in Water for Texas, State Water Plan for Texas, 2017, the AUTHORITY's groundwater aquifers, and all basins in the watershed, are potentially threatened by increases in temperature, decreases in precipitation, and increases in population, coupled with demand for recreational activities.

From the Water for Texas, State Water Plan for Texas, 2017 climate change is projected to affect many aspects of water resources management in the AUTHORITY's water service areas. The following were listed as vulnerabilities:

- Water Supply
- Insufficient local water supply
- Increased dependence on imported supply
- Inability to meet water demand during droughts
- Shortage in long-term operational water storage capacity

4.5.2 Subcriterion: Utilizing Natural Resources

The AMI project will help ensure American energy needs. The AUTHORITY anticipates there will be a reduced demand for electricity the AUTHORITY uses for pumping. By utilizing the AMI system there will be a reduction in overall driving miles for meter readers, leading to a reduction in greenhouse gas emissions.

This project is expected to save a lot of energy. The AUTHORITY uses energy to distribute water. The Authority serves water at in areas of North Texas with elevation changes as much as 300 feet in some pressure planes. Due to the variation in topography, pumping is required to move this water throughout the system. It takes 450 kWh/AF to pump water based on energy usage for the Authority. Therefore, a total of 9,315 kWh of energy could be saved annually due to efficiency and decreased water.

The AUTHORITY AMI Project is expected to result in a large amount of water, energy, and greenhouse gas savings. The Authority expects the project to conserve 20.7 Acre feet per year (AFY). This water savings will also result in savings of approximately 431,243 kWh per year on the potable water system, or 5,662 pounds of carbon dioxide emissions.

The AUTHORITY plans for one maintenance technician to be reassigned to auto read meters, instead of two district managers reading meters, which will reduce the miles driven to manually read the



meters. Since stops will not be made at every meter, and in some areas, whole streets will be bypassed due to the capture range, this is estimated to reduce mileage by 30%. A district manager averages 7,000 miles per year reading meters. After the AMI Meter Replacement Program is completed, 4,200 vehicle miles per year will be reduced (7,000 vehicle miles per year * 2 district managers * 0.30).

4.5.3 Subcriterion: Modernizing Infrastructure

The AUTHORITY needs to modernize its aging infrastructure. The AMI meters will provide hourly usage information, leak alerts, eliminate estimating meter reads, and potentially allow customers access to their usage information (via the customer portal). The AUTHORITY is at a critical point in its history. It needs to bring innovative change to better service its customers. It is time for the AUTHORITY to take a more active part in regional water management, with neighboring water providers, and as a stakeholder in the TWDB Region B. By implementing AMI, the AUTHORITY hopes to be a test case in best management

4.6 Evaluation Criterion F: Implementation and Results

4.6.1 Subcriterion: Project Planning

The AMI meters will provide hourly usage information, leak alerts, eliminate estimating meter reads, and allow customers access to their usage information (via the customer portal). Once all of the meters are installed, the AUTHORITY will be able to customize the conservation efforts, identify problem leak areas, and develop plans for future facilities more efficiently.

4.6.2 Subcriterion: Performance Measures

The AUTHORITY is committed to excellence and improving the water use efficiency within the AUTHORITY's water service area. It is the goal of the AUTHORITY to fully evaluate the benefits and capabilities of the AMI 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 implementation stages of the project

The AMI Meter Replacement Program will assist the AUTHORITY's staff and customers to minimize leaks, provide real time detailed usage information to the conservation department so they can be more effective, and reduce meter technician work hours and vehicle miles. Once the AMI Meter Replacement Program is fully implemented for one year, the AUTHORITY will compare the unaccounted, non-revenue water quantity before and after project completion. The AUTHORITY will compare the quantity of water associated with customer leak adjustments before and after project completion. The AUTHORITY will then compare the use-per-capita before and after project completion to determine the effectiveness of the improved conservation information. The AUTHORITY will also compare employee and vehicle expenses related to meter reading before and after project completion.

4.6.2.1: Measuring Devices

For projects that install or replace existing municipal meters, the applicant should consider



the following:

- ***Whether the project includes new meters where none existed previously or replaces existing meters.***

The project will replace existing manual meters with AMI meters.

- ***Whether the project includes individual water user meters, main line meters, or both.***

The project will include individual water user meters only.

- ***If the project replaces existing meters with new meters, whether new technologies (automatic meter reading (AMI) or advanced metering infrastructure (AMI) meters) will be employed.***

The project will replace existing manual meters with AMI meters.

- ***If main line meters are included, whether system leak detection may be improved.***

The project will not be installing main line meters.

- ***Include a description of both pre and post-project rate structuring.***

For residential customers, the AUTHORITY has a monthly, multi-tiered, inclining block rate which includes a monthly service charge (first 2,000 gallons are included) and a tiered structure for usage in excess of 2,000 gallons. Rates will be reviewed in early 2020; however the AUTHORITY expects that any increases will be consistent with the previous annual increases.

4.6.3 Subcriterion: Readiness to Proceed

The AUTHORITY has completed the research and product selection for the AMI system and has funding ready for the initial phase of the implementation plan. Upon entering into a financial assistance agreement with the Bureau of Reclamation, the AUTHORITY will be able to proceed with the purchase and installation of AMI meters as identified in the AMI Meter Replacement Program.

The following is a summary of the implementation plan:

- Install the Sensus AMI mobile network (2 collectors) in two vehicle, which will read all of the AUTHORITY's meter locations. Collectors to be installed by Sensus contractor.
- The Sensus contractor will modify or replace the existing meter box so that it is a minimum of three feet deep, install the iPERL meter with 520M MXU radios. The radio will be installed below the meter box lid. The Sensus contractor will then program the radio and modify the radio location if radio reception is an issue.
- As routes are converted to the radio-read system, meter technicians will be able to perform other important maintenance tasks (valve turning, hydrant maintenance, air valve maintenance, backflow program) that have previously been deferred. The



AUTHORITY plans on completing this project within one year.

Assuming normal weather conditions for this project, the AUTHORITY estimates in can install 550 radio read meters in one year. At that rate, the AMI Meter Replacement Program will be fully implemented by October of 2020.

4.6.4 Subcriterion: Reasonableness of Costs

The AUTHORITY expects the TWDB to continue its efforts to reduce water use throughout the State and therefore the AUTHORITY needs to implement a strategy to reduce production on a long-term basis. The AUTHORITY already has an extensive water conservation program that has been in place for over a decade, and has reduced water GPCD by 15% since 2009. Still, the AUTHORITY must endeavor to reduce production. Consumption per capita for the AUTHORITY's customers for the 2009-2014 period averaged 118 gallons per day. The AUTHORITY can and will continue in its efforts to reduce consumption. If the AUTHORITY is to reach its targeted reduction, the focus will have to be on identifying and replacing meters that are no longer reading accurately, and identifying consumer and main line leaks earlier. The AMI system will significantly improve the ability to do so.

Sensus provided a 20-year warranty on the meter register and radio (see Exhibit 4). Over the 20-year life of the meters, the AUTHORITY would realize savings related to the reduction in production of 145 AF per year water production at today's cost. The cost benefit of the AMI Meter Replacement Project is the increase in revenue related the additional 3% of usage that will be registered through the new meters. During the meter research, the AUTHORITY staff estimated that the AUTHORITY under-bills its customers \$155,600/year due to the meters under registering usage. The AUTHORITY will realize an estimated benefit of \$444,600 in additional revenue over the 20-year life of the AMI meters.

The estimated labor cost to install the meter components is approximately \$30,700. Using contract labor to install the meters will not require any increase in staffing to the AUTHORITY.

It is the goal of the AUTHORITY to equip employees with the adequate tools and capability to not only monitor water production and consumption but determine also to analyze and evaluate solutions and follow-up actions for all factors that may contribute to water loss. Similarly, it is the goal of the AUTHORITY 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.

4.7 Evaluation Criterion G: Nexus to Reclamation Project Activities

The project has no direct connection to a reclamation project.

4.8 Evaluation Criterion H: Additional Non-Federal Funding

Non-federal funding will represent 62.5% of the total project costs. The AUTHORITY is requesting \$75,000 in federal funding to facilitate deployment of 550 radio read meters throughout the



AUTHORITY's service area. The AUTHORITY will be matching this federal funding through operating revenues of \$125,000.

SECTION 5. PROJECT BUDGET

The complete AMI Project Budget includes a Funding Plan, Budget Proposal, and Budget Narrative. The SF-424C Budget Form (Budget Proposal) is attached to this application – Budget Form SF-424C.

5.1 Funding Plan

The AUTHORITY will fund 100 percent of all non-Federal project costs. The Advanced Metering Infrastructure Project will be funded from the operating budget and not CIP. Other than the funding provided by the Bureau of Reclamation under this grant application and the AUTHORITY, there are no other sources of funding necessary to complete this project. As there are no other sources of funding other than the AUTHORITY, a letter of commitment is not required for this application.

- **Cost Share Contribution:** The Utility Authority will provide its cost share in monetary (cash) contributions. The AMI Project has been and is included in the Capital Budget and is funded by water sales revenue and interest income.
- **In-kind Costs Incurred Before the Anticipated Project Start Date:** The AUTHORITY does not anticipate any in-kind costs prior to the project start date.
- **Funding Requests from other Federal Partners:** No other funding has been requested or received from other Federal partners.
- **Pending Funding Requests:** There are no pending funding requests and no other AUTHORITY projects have a direct connection to a reclamation project.

5.2 Budget Narrative

Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The budget narrative provides a discussion of, or explanation for, items included in the budget proposal.

Salaries and Wages

The Program Manager for this project is Fabian Heaney, Assistant General Manager for the AUTHORITY. The total cost for this position is expected to be \$2,281 with an estimated 42 hours of labor at a rate of compensation at \$54.32. This labor rate is separate from the fringe benefit rate. The specific tasks for this position include supervising the project, preparing administrative reports and presentations and attending board meetings.

All other Labor is provided by the AMI contractor.

No subcontractor labor will be used. All salaries will remain at the same rate for the Fiscal Years 2020-21 as there will not be any salary increases for the positions listed under the budget.

Fringe Benefits



For full-time employees, the Board approve percentage rate to calculate the fringe benefits is 54.74%. The total combined fringe benefit costs for the full-time employee amounts to \$1,248.

Travel

There are no travel expense costs that need to be itemized under this project.

Equipment

There are two types of equipment that is being purchased for this project.

The AMI equipment includes the AMI meter, and wire connectors to enable connection to the transmitter located on the top of each meter box, electronic transmitter, battery, wiring, and installation. This equipment is vital to the project as the AMI meters have the digital capabilities to track usage and to transmit the data to the collection station. The cost of this equipment is \$301.94 for each unit. The contractor will install 550 units during the 2020 fiscal year for a total cost of \$166,069.

The ancillary equipment includes a Vehicle Gateway Base station, AutoVu Software, Mapping Software, Novus Setup, AMR Setup, and support. The cost of this equipment during the 2020 fiscal year is a total cost of \$30,402.

Supplies and Materials

There are no supplies and materials expense costs that need to be itemized under this project.

Contractual

There are no contractual expense costs that need to be itemized under this project.

Environmental and Regulatory Compliance Costs

There are no environmental and regulatory compliance expense costs that need to be itemized under this project.

Other Expenses

There are no other expenses that need to be itemized under this project.

Indirect Costs

There are no indirect costs that need to be itemized under this project.

Total Costs The total cost to implement this project is **\$200,000** with a Federal cost share amount of \$75,000 and a non-Federal cost share amount of \$125,000.

Non-federal funding will represent 62.5% of the total project costs. The AUTHORITY is requesting \$75,000 in federal funding to facilitate deployment of 550 radio read meters throughout the AUTHORITY's service area. The AUTHORITY will be matching this federal funding through operating revenues of \$125,000.



SECTION 6. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. The AUTHORITY AMI Implementation Program involves the installation of new AMI meters. There are no anticipated environmental or cultural resources impacts with the proposed project.

- 1) Will the project impact the surrounding environment (e.g., soil dust, air, water [quality and quantity], and animal habitat)?**

There are no anticipated impacts to the surrounding environment. The new radio read meters will be installed into existing meter boxes.

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

No, it is not anticipated that any species would be affected by any activities associated with the proposed project.

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

No, there are no wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "waters of the United States."

- 4) When was the water delivery system constructed?**

The majority of the AUTHORITY's water systems were constructed during the 1960s to 1980s. The AUTHORITY has acquired additional small water systems over time.

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

No, the project will not result in any modifications or effects to individual features of an irrigation system.



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

No, there are no buildings, structures, or features in the project area listed or eligible for listing on the National Register of Historic Places.

- 7) ***Are there any known archaeological sites in the proposed project area?***

No, there are no known archaeological sites in the proposed project area. The new radio read meters will be installed into existing meter boxes.

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

No, the project will not have a disproportionately high and adverse effect on low income or minority populations.

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

No, the project will not limit access to and ceremonial use of Indian sacred sites or result in other negative impacts on tribal lands.

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

The project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native species known to occur in the area.

SECTION 7. REQUIRED PERMITS OR APPROVALS

There are no required permits anticipated for this project. All of the project work will be conducted at current meter locations. All project-related approvals will be handled by the AUTHORITY and will be executed in a timely and efficient manner.

7.1 NEPA -National Environmental Policy Act

The AUTHORITY does not anticipate any impacts on the environment and will fit within a Categorical Exclusion to NEPA. Any environmental impacts will be minimized during construction using best management practices.

7.2 NHPA -National Historic Preservation Act



There will be no impacts on historic sites as a result of this project.

7.3 ESA -Endangered Species Act

There is no critical habitat or endangered or threatened species that will be negatively affected by this project.

7.4 State Permits

No State permits will be required for the project.

7.5 Local Permits

There are no other local permits that will be required for the project.

SECTION 8. LETTERS OF SUPPORT

The AUTHORITY has secured three (3) letters of support from various stakeholders. These letters are to be found in Exhibit 4 in the Exhibit section of this application. The stakeholders and representatives are as follows:

- 1) City of Wichita Falls Director of Public Works – Mr. Russell Schreiber, P.E.
- 2) Texas Water Development Board Region B Engineer – Mr. Kerry D. Maroney, P. E.
- 3) Red River Valley Association Executive Director – Mr. Richard Brontoli

SECTION 9. OFFICIAL RESOLUTION

An official resolution meeting the requirements set forth above is mandatory. An official resolution of the Red River Authority of Texas was passed at the meeting of the Board of Directors on April 2, 2019. The Resolution is attached to this application.

The resolution verifies the AUTHORITY's legal authority to enter into an agreement; the Board of Directors has reviewed and supports submittal of this application; the capability of the Authority to provide the amount of funding and in-kind contributions specified in the Funding Plan; and that the Authority will work cooperatively with the Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement.

SECTION 10. ATTACHMENTS



Exhibit 1. Water Meter Specifications

DS-W-IPL-00-0110-03-A

iPERL™ Water Management System Electromagnetic Flow Measurement System

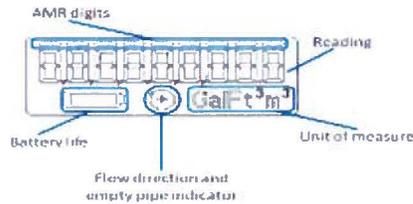
Description

5/8" (DN 15mm), 3/4" (DN 20mm) and 1" (DN 25mm) Sizes

With no moving parts, the Sensus iPERL water management system is based on innovative electromagnetic flow measurement technology. The iPERL system family has an operating range of 0.03 gpm (0.007 m³/hr) @ 95% minimum to 55 gpm (12.5 m³/hr) @ 100% ± 1.5% registration of actual throughput.



Electronic Register LCD Display



Features

CONFORMANCE TO STANDARDS

The iPERL system far exceeds the most recent revision of ANSI/AWWA Standard C-700 and C-710 for accuracy and pressure loss requirements. All iPERL systems are NSF/ANSI Standard 61 Annex F and G compliant and tested to AWWA standards.

PERFORMANCE

The patented measurement technology of the iPERL system allows enhanced accuracy ranges at both low and high flows and perpetual accuracy over the life of the product over the full measurement range when installed horizontal, vertical or diagonal.

CONSTRUCTION

The iPERL system is an integrated unit that incorporates an electronic register and measuring device encased in an external housing. The measuring device is comprised of a composite alloy flowtube with externally-threaded spud

ends. Embedded in the flowtube are magnetic flow sensors. The all electronic, programmable register is hermetically sealed with a tempered glass cover. The iPERL system has a 20 year life cycle, along with a 20 year battery life guarantee.

ELECTRONIC REGISTER

The high resolution 9-digit hermetically sealed electronic register with LCD display was designed to eliminate dirt, lens fogging issues and moisture contamination in pit settings with built in tamper protection. The tempered glass register cover displays readings with the AMR digits highlighted. Direction of flow and units of measure are also easily readable on the register display. The iPERL register features AMR resolution and unit of measure that are fully programmable, integral customer data logging compatible with UniPro software tools. The large, easy to read display also includes battery life, empty pipe and forward/reverse flow indicators.

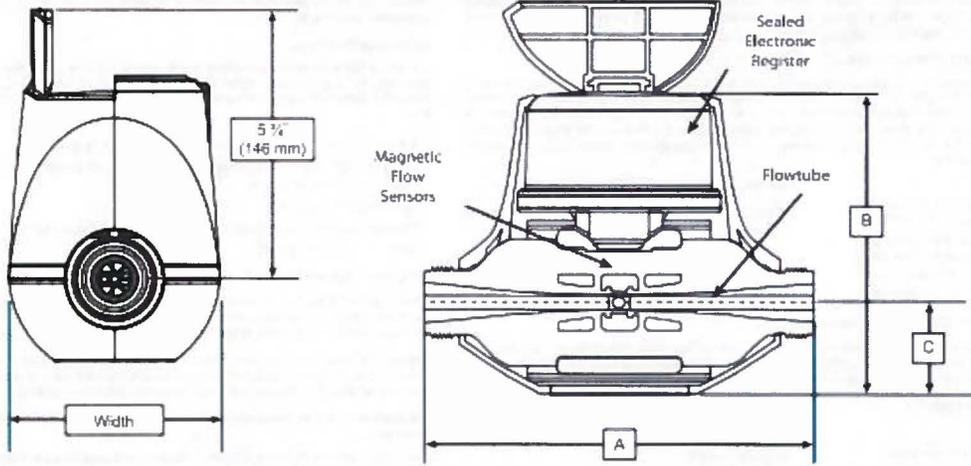
TAMPERPROOF FEATURES

The integrated construction of the iPERL system prevents removal of the register to obtain free water. The magnetic tamper and low field alarms will both indicate any attempt to tamper with the magnetic field of the iPERL system.

AMR / AMI SYSTEMS

iPERL systems are compatible with current Sensus AMR/AMI systems.





DIMENSIONS AND NET WEIGHTS

Size	A (flw length)	B	C	Soud Ends	NPSM Thread Size	Width	Net Weight
5/8" (DN 15 mm)	7-1/2" (190 mm)	5-9/10" (155 mm)	1-3/4" (44 mm)	5/8" (15 mm)	3/4" (19 mm)	4-1/2" (114 mm)	3.1 lbs (1.4 kg)
3/4"S (5/8" x 3/4") (DN 20 mm)	7-1/2" (190 mm)	5-9/10" (155 mm)	1-3/4" (44 mm)	3/4" (20 mm)	1" (25 mm)	4-1/2" (114 mm)	3.1 lbs (1.4 kg)
3/4" (DN 20 mm)	9" (229 mm)	5-9/10" (155 mm)	1-3/4" (44 mm)	3/4" (20 mm)	1" (25 mm)	4-1/2" (114 mm)	3.2 lbs (1.5 kg)
1" (DN 25 mm)	10-3/4" (273 mm)	5-9/10" (155 mm)	1-3/4" (44 mm)	1" (25 mm)	1-1/4" (32 mm)	4-1/2" (114 mm)	3.3 lbs (1.5 kg)

SPECIFICATIONS

SERVICE	Measurement of clear water Operating temperature range of 33 °C (91.6 °C) - 150 °F (65.6 °C)
NORMAL OPERATING FLOW RANGE (5% - 95%)	5/8" (DN 15mm) size: 0.11 to 25 gpm (0.02 to 5.7 m ³ /hr) 3/4" (DN 20mm) size: 0.17 to 35 gpm (0.02 to 8.0 m ³ /hr) 1" (DN 25mm) size: 0.4 to 55 gpm (0.09 to 12.5 m ³ /hr)
LOW FLOW REGISTRATION (5% - 95%)	5/8" (DN 15mm) size: 0.03 gpm (0.007 m ³ /hr) 3/4" (DN 20mm) size: 0.03 gpm (0.007 m ³ /hr) 1" (DN 25mm) size: 0.11 gpm (0.025 m ³ /hr)
MAXIMUM OPERATING PRESSURE LOSS	5/8" (DN 15mm) size: 4 psi at 15 gpm (0.3 bar at 3.4 m ³ /hr) 3/4" (DN 20mm) size: 2 psi at 15 gpm (0.1 bar at 3.4 m ³ /hr) 1" (DN 25mm) size: 2 psi at 25 gpm (0.1 bar at 5.7 m ³ /hr)
MAXIMUM OPERATING PRESSURE	200 psi (13.8 bar)
MEASUREMENT TECHNOLOGY	Sealed state electromagnetic flow

REGISTER	Hermetically sealed, 9-digit programmable electronic register AMR/MH1 compatible PERC system register programmable using the UniPro gas analyser package
MATERIALS	External housing - Thermal plastic Flowtube - Polychloroethylene Electrode - Silver/silver chloride Register cover - Tempered glass
ALARM DEFAULTS	Alarm Deadband - 90 days Lock Duration - 30 hours Data Log Retention - 1 hour Alarm Mask - All alarms reported History Mask - All events bypass reported



Sensus Limited Warranty

G-500 R21

I. General Product Coverage

Sensus USA Inc. ("Sensus") warrants its products and parts to be free from defects in material and workmanship for one (1) year from the date of Sensus shipment and as set forth below. All products are sold to customer ("Customer") pursuant to Sensus Terms of Sale, available at sensus.com/TC ("Terms of Sale").

II. SR II® and accuSTREAM™ 5/8", 3/4" & 1" Meters...

are warranted to perform to AWWA New Meter Accuracy Standards for five (5) years from the date of Sensus shipment or until the registration shown below whichever occurs first. Sensus further warrants that the SR II and accuSTREAM meters will perform to at least AWWA Repaired Meter Accuracy Standards for fifteen (15) years from the date of Sensus shipment or until the registration shown below whichever occurs first.

	New Meter Accuracy	Repar Meter Accuracy
5/8" SR II Meter and accuSTREAM Meter	500,000 gallons	1,500,000 gallons
3/4" SR II Meter and accuSTREAM Meter	750,000 gallons	2,250,000 gallons
1" SR II Meter and accuSTREAM Meter	1,000,000 gallons	3,000,000 gallons

III. SR® 5/8", 3/4" & 1" Meters...

are warranted to perform to AWWA New Meter Accuracy Standards for one (1) year from the date of Sensus shipment. Sensus further warrants that the 5/8", 3/4" and 1" SR meter will perform to at least AWWA Repaired Meter Accuracy Standards for fifteen (15) years from the date of Sensus shipment or until the registration shown below, whichever occurs first.

	Repar Meter Accuracy
5/8" SR Meter	1,500,000 gallons
3/4" SR Meter	2,250,000 gallons
1" SR Meter	3,000,000 gallons

IV. SR 1-1/2" & 2"...

are warranted to perform to AWWA New Meter Accuracy Standards for one (1) year from the date of Sensus shipment. Sensus further warrants that the 1-1/2" and 2" SR meter will perform to at least AWWA Repaired Meter Accuracy Standards for ten (10) years from the date of Sensus shipment or until the registration shown below, whichever occurs first.

	Repar Meter Accuracy
1-1/2" SR	5,000,000 gallons
2" SR	8,000,000 gallons

V. PNM® 5/8", 3/4", 1" Meters...

are warranted to perform to AWWA New Meter Accuracy Standards for one (1) year from the date of Sensus shipment. Sensus further warrants that the 5/8", 3/4", and 1" PNM meter will perform to at least AWWA Repaired Meter Accuracy Standards for fifteen (15) years from the date of Sensus shipment or until the registration shown below, whichever occurs first.

	Repar Meter Accuracy
5/8" PNM	1,500,000 gallons
3/4" PNM	2,000,000 gallons
1" PNM	3,000,000 gallons

VI. PNM 1-1/2", 2" Meters...

are warranted to perform to AWWA New Meter Accuracy Standards for one (1) year from the date of Sensus shipment. Sensus further warrants that the 1-1/2" and 2" PNM meter will perform to at least AWWA Repaired Meter Accuracy Standards for ten (10) years from the date of Sensus shipment or until the registration shown below, whichever occurs first.

	Repar Meter Accuracy
1-1/2" PNM	5,000,000 gallons
2" PNM	8,000,000 gallons

VII. IPERL™ Water Management Systems...

Each register water flow are warranted to perform to the accuracy levels set forth in the IPERL Water Management System Data Sheet available at sensus.com/ipperl/wmsystem or by request from 1-800-METER-IT, for twenty (20) years from the date of Sensus shipment. The IPERL System warranty does not include the external housing.

VIII. Maincase...

of the SR, SR II and PNM in both standard and low lead alloy meters are warranted to be free from defects in material and workmanship for twenty-five (25) years from the date of Sensus shipment. Composite and E-coated maincases will be free from defects in material and workmanship for fifteen (15) years from the date of Sensus shipment.

IX. Sensus "W" Series Turbo Meters, OMNI™ Meters and Propeller Meters...

are warranted to perform to AWWA New Meter Accuracy Standards for one (1) year from the date of Sensus shipment.

X. Sensus accuMAG™ Meters...

are warranted to be free from defects in material and workmanship under normal use and service, for 18 months from the date of Sensus shipment or 12 months from startup, whichever occurs first.

XI. Sensus Registers...

are warranted to be free from defects in material and workmanship from the date of Sensus shipment for the periods stated below or until the applicable registration for AWWA Repaired Meter Accuracy Standards, as set forth above, are surpassed, whichever occurs first:

5/8" thru 2" SR, SR II, PNM, accuSTREAM Standard Registers	25 years
5/8" thru 2" SR, SR II, PNM, accuSTREAM Encoder Registers	10 years
Electronic Communication Index (ECI)	10 years
A9 HSPU, IMP Contactor, R.E.R. Elec. ROFI	1 year
Standard and Encoder Registers for "W" Turbo and Propeller Meters	1 year
OMNI Register with Battery	10 years

XII. Sensus Electric Meters...

are warranted to be free from defects in material and workmanship for one (1) year from the date of Sensus shipment. Spare parts and components are warranted to be free from defects in material and workmanship for one (1) year from the date of Sensus shipment.

Repaired or refurbished equipment repaired by Sensus is warranted to be free from defects in material and workmanship for ninety (90) days from the date of Sensus shipment or for the time remaining on the original warranty period, whichever is longer.

XIII. Batteries, IPERL System Components, AMR and FlexNet™ System AMI Interface Devices...

are warranted to be free from defects in material and workmanship from the date of Sensus shipment for the period stated below:

Electronic TouchPad	10 years
RadioRead™ MXU (Model 505C, 510R or 520R) and Batteries	20 years*
Act-Pak® Instrumentation	1 year
TouchRead™ Coupler and AMR Equipment	1 year
FlexNet Water or Gas SmartPoint™ Modules and Batteries	20 years**
5500 series (or older) Hand Held Device	1 year
6500 series Hand Held Device	2 years
Vehicle Gateway Base Station	1 year
FlexNet Base Station (including the Metro and M400 base stations)	1 year
Echo Transceiver	1 year
Remote Transceiver	1 year
ICosa and FlexNet Electricity SmartPoint Module	1 year
IPERL System Battery and IPERL System Components	20 years**
Residential Electronic Register	20 years**
Smart Gateway	1 year

* Sensus will repair or replace non-performing

- RadioRead MXU (Model 505C, 510R and 520R) and Batteries.

- FlexNet Water or Gas SmartPoint Modules (configured to the factory setting of six transmissions per day under normal system operation of up to one demand read to each SmartPoint Module per month and up to two firmware downloads during the life of the product) and batteries.

- Residential Electronic Register with hourly reads, and

- IPERL System Batteries, and/or the IPERL System flowcube, the flow sensing and data processing assemblies, and the register ("IPERL System Components") with hourly reads.

at no cost for the first ten (10) years from the date of Sensus shipment, and for the remaining ten (10) years, at a prorated percentage applied towards the published list prices in effect for the year product is accepted by Sensus under warranty conditions according to the following schedule:

Years	Replacement Price	Years	Replacement Price
1 - 10	0%	16	55%
11	30%	17	60%
12	35%	18	65%
13	40%	19	70%
14	45%	20	75%
15	50%	>20	100%

Note: Software supplied and licensed by Sensus is warranted according to the terms of the applicable software license agreement. Sensus warrants that network and monitoring services shall be performed in a professional and workmanlike manner.

XIV. Return...

Sensus' obligation and Customer's exclusive remedy, under this Sensus Limited Warranty is, at Sensus' option, to either (i) repair or replace the product, provided the Customer (a)

8601 Six Forks Road, Suite 700
Raleigh, NC 27615
1-800-638-3748

SENSUS



returns the product to the location designated by Sensus within the warranty period; and (b) prepays the freight costs both to and from such location, or (i) deliver replacement components to the Customer, provided the Customer installs, at its cost, such components in or on the product (as instructed by Sensus), provided, that if Sensus requests, the Customer (a) returns the product to the location designated by Sensus within the warranty period; and (b) prepays the freight costs both to and from such location. In all cases, if Customer does not return the product within the time period designated by Sensus, Sensus will invoice, and Customer will pay within thirty days of the invoice date, for the cost of the replacement product and/or components.

The return of products for warranty claims must follow Sensus Returned Materials Authorization (RMA) procedures. Water meter returns must include documentation of the Customer's test results. Test results must be obtained according to AWWA standards and must specify the meter serial number. The test results will not be valid if the meter is found to contain foreign materials. If Customer chooses not to test a Sensus water meter prior to returning it to Sensus, Sensus will repair or replace the meter, at Sensus' option, after the meter has been tested by Sensus. The Customer will be charged Sensus' then current testing fee. Sensus SmartPoints modules and MKU's returned must be affixed with a completed return evaluation label. For all returns, Sensus reserves the right to request meter reading records by serial number to validate warranty claims.

For products that have become discontinued or obsolete ("Obsolete Product"), Sensus may, at its discretion, replace such Obsolete Product with a different product model ("New Product"), provided that the New Product has substantially similar features as the Obsolete Product. The New Product shall be warranted as set forth in this Sensus Limited Warranty.

THIS SECTION XIV SETS FORTH CUSTOMER'S SOLE REMEDY FOR THE FAILURE OF THE PRODUCTS, SERVICES OR LICENSED SOFTWARE TO CONFORM TO THEIR RESPECTIVE WARRANTIES.

XV. Warranty Exceptions and No Implied Warranties.

This Sensus Limited Warranty does not include costs for removal or installation of products, or costs for replacement labor or materials, which are the responsibility of the Customer. The warranties in this Sensus Limited Warranty do not apply to goods that have been installed improperly or in non-recommended installations, installed to a socket that is not functional, or is not in safe operating condition, or is damaged, or is in need of repair, tampered with, modified or repaired with parts or assemblies not certified in writing by Sensus, including without limitation, communication parts and assemblies, improperly modified or repaired (including as a result of modifications required by Sensus); converted; altered; damaged; read by equipment not approved by Sensus; for water meters, used with substances other than water, used with non-potable water, or used with water that contains dirt, debris, deposits, or other impurities; subjected to misuse, improper storage, improper care, improper maintenance, or improper periodic testing (collectively, "Exceptions"). If Sensus identifies any Exceptions during examination, troubleshooting or performing any type of support on behalf of Customer, then Customer shall pay for and/or reimburse Sensus for all expenses incurred by Sensus in examining, troubleshooting, performing support activities, repairing or replacing any Equipment that satisfies any of the Exceptions defined above. The above warranties do not apply in the event of Force Majeure, as defined in the Terms of Sale.

THE WARRANTIES SET FORTH IN THIS SENSUS LIMITED WARRANTY ARE THE ONLY WARRANTIES GIVEN WITH RESPECT TO THE GOODS, SOFTWARE LICENSES AND SERVICES SOLD OR OTHERWISE PROVIDED BY SENSUS. SENSUS EXPRESSLY DISCLAIMS ANY AND ALL OTHER REPRESENTATIONS, WARRANTIES, CONDITIONS, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE, REGARDING ANY MATTER IN CONNECTION WITH THIS SENSUS LIMITED WARRANTY OR WITH THE TERMS OF SALE, INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, NON-INFRINGEMENT AND TITLE.

SENSUS ASSUMES NO LIABILITY FOR COSTS OR EXPENSES ASSOCIATED WITH LOST REVENUE OR WITH THE REMOVAL OR INSTALLATION OF EQUIPMENT. THE FOREGOING REMEDIES ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES FOR THE FAILURE OF EQUIPMENT, LICENSED SOFTWARE OR SERVICES TO CONFORM TO THEIR RESPECTIVE WARRANTIES.

XVI. Limitation of Liability.

SENSUS' AGGREGATE LIABILITY IN ANY AND ALL CAUSES OF ACTION ARISING UNDER, OUT OF OR IN RELATION TO THIS AGREEMENT, ITS NEGOTIATION, PERFORMANCE, BREACH OR TERMINATION (COLLECTIVELY "CAUSES OF ACTION") SHALL NOT EXCEED THE TOTAL AMOUNT PAID BY CUSTOMER TO SENSUS UNDER THIS AGREEMENT. THIS IS SO WHETHER THE CAUSES OF ACTION ARE IN TORT (INCLUDING, WITHOUT LIMITATION, NEGLIGENCE OR STRICT LIABILITY), IN CONTRACT, UNDER STATUTE OR OTHERWISE.

AS A SEPARATE AND INDEPENDENT LIMITATION ON LIABILITY, SENSUS LIABILITY SHALL BE LIMITED TO DIRECT DAMAGES. SENSUS SHALL NOT BE LIABLE FOR: (i) ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, NOR (ii) ANY REVENUE OR PROFITS LOST BY CUSTOMER OR ITS AFFILIATES FROM ANY END USER(S), IRRESPECTIVE OF WHETHER SUCH LOST REVENUE OR PROFITS IS CATEGORIZED AS DIRECT DAMAGES OR OTHERWISE, NOR (iii) ANY IN/OUT COSTS, NOR (iv) MANUAL METER READ COSTS AND EXPENSES, NOR (v) DAMAGES ARISING FROM MAINCASE OR BOTTOM PLATE BREAKAGE CAUSED BY FREEZING TEMPERATURES, WATER HAMMER CONDITIONS, OR EXCESSIVE WATER PRESSURE. "IN/OUT COSTS" MEANS ANY COSTS AND EXPENSES INCURRED BY CUSTOMER IN TRANSPORTING GOODS BETWEEN ITS WAREHOUSE AND ITS END USER'S PREMISES AND ANY COSTS AND EXPENSES INCURRED BY CUSTOMER IN INSTALLING, UNINSTALLING AND

REMOVING GOODS. "END USER" MEANS ANY END USER OF ELECTRICITY/WATER/GAS THAT PAYS CUSTOMER FOR THE CONSUMPTION OF ELECTRICITY/WATER/GAS, AS APPLICABLE.

The limitations on liability set forth in this Agreement are fundamental inducements to Sensus entering into this Agreement. They apply unconditionally and in all respects. They are to be interpreted broadly so as to give Sensus the maximum protection permitted under law.

To the maximum extent permitted by law, no Cause of Action may be instituted by Customer against Sensus more than TWELVE (12) MONTHS after the Cause of Action first arose. In the calculation of any damages in any Cause of Action, no damages incurred more than TWELVE (12) MONTHS prior to the filing of the Cause of Action shall be recoverable.

8601 Six Forks Road, Suite 700
Raleigh, NC 27615
1-800-638-3748



Exhibit 2. Letters of Recommendation & Resolution



PUBLIC WORKS DEPARTMENT

Bureau of Reclamation
Financial Assistance Support Section
ATTN: Mr. Darren Olsen
P.O. Box 25007, MS 84-27814
Denver, CO 80225

March 18, 2019

Re: Bureau of Reclamation WaterSMART Grant Application: The Red River Authority of Texas "Advanced Metering Infrastructure Project"

Dear Mr. Olsen,

It is my pleasure to send a letter in support of the Red River Authority of Texas in its plan to implement the "Advanced Metering Infrastructure Project". This project will provide increased accessibility to water supplies that would otherwise be lost or unaccounted for, in addition to promoting the critical need for water conservation throughout the North Texas region. The Red River Authority of Texas has deemed it necessary to ensure a reliable supply of water through water conservation to help meet future water demands.

As a water provider in the region, I appreciate the need for water conservation, especially in the midst of potential droughts, as this region of Texas has already experienced in the recent past. The Red River Authority of Texas is responsible for providing the water needs of approximately 10,000 customers in the North Texas region within the Red River Basin. It is important to note that Red River Authority of Texas serves rural and underserved populations across North Texas. The distinctive hydrogeological and topographic elements of the Red River Basin provide a vital local resource of surface and ground water that needs to be conserved and protected. The proposed Advanced Metering Infrastructure Project would provide for the replacement of approximately 3,900 antiquated analog meters with advanced digital metering and radio reading technology. This project enhances local, state, and federal water conservation objectives by measuring water production, usage, and leakage, which will result in quantifiable water and energy savings.

I hope this expression of support is helpful in your consideration of the Red River Authority of Texas application.

Respectfully,

Russell Schreiber, P.E.
Director of Public Works

CITY OF WICHITA FALLS

3007 S Steel • P.O. Box 1431 • Wichita Falls, Texas 76307 • t: (940) 761-7477 • f: (940) 761-6873
www.wchitafalls.tx.gov





BIGGS & MATHEWS INC.
Consulting Engineers

March 18, 2019

Bureau of Reclamation
Financial Assistance Support Section
ATTN: Mr. Darren Olsen
P.O. Box 25007, MS 84-27814
Denver, CO 80225

**Re: Bureau of Reclamation WaterSMART Grant Application: The Red River Authority of Texas
"Advanced Metering Infrastructure Project"**

Dear Mr. Olsen:

Biggs & Mathews, Inc has been the consulting engineer for Red River Authority of Texas (RRA) for the past fifty (50) years. In addition, we are the Engineer of Record for the Texas Water Development (TWDB) Region B Regional Water Plan, which is a fifty (50) regional plan that is updated every five (5) years under the general guide lines and statues adopted by the State of Texas. The TWDB, as does the RRA, understands the importance of water conservation to the extent that both TWDB and RRA have made water conservation a mandatory requirement as part of the Region B Regional Water Plan.

Currently, RRA provides water service to approximately 10,000 customers, in the North Texas area, with the majority of those customers being in the remote rural areas and conservation is of utmost importance relating to both surface water and groundwater resources.

It is my understanding that this project will replace approximately 3,900 outdated analog meters with the latest technology including radio-type digital read meters which are anticipated to conserve water by accurately accounting for water production, water usage and leak detection which will result in quantifiable water and energy savings.

Therefore, Biggs & Mathews, Inc. whole-heartedly supports the RRA in the implementation of the "Advanced Metering Infrastructure Project, and request that the Bureau of Reclamation provides the RRA with the necessary grant to fund this noble endeavor and worthwhile project.

Please contact me with any questions or comments, or if additional information is required.



Sincerely,

Biggs & Mathews, Inc.

Kerry D. Maroney
Kerry D. Maroney, P.E.

2500 BROOK AVENUE • WICHITA FALLS, TEXAS 76301-6105 • (940) 766-0156 • FAX: (940) 766-3383



Red River Valley Association
P.O. Box 709
Shreveport, LA 71162
(318) 221-5233 / rrva@rrva.org

March 18, 2019

Bureau of Reclamation
Financial Assistance Support Section
ATTN: Mr. Darren Olsen
P.O. Box 25007, MS 84-27814
Denver, CO 80225

**Re: Bureau of Reclamation WaterSMART Grant Application: The Red River Authority of Texas
“Advanced Metering Infrastructure Project”**

Dear Mr. Olsen,

It is my pleasure to send a letter in support of the Red River Authority of Texas in its plan to implement the “Advanced Metering Infrastructure Project”. This project will provide increased accessibility to water supplies that would otherwise be lost or unaccounted for, in addition to promoting the critical need for water conservation throughout the North Texas region. The Red River Authority of Texas has deemed it necessary to ensure a reliable supply of water through water conservation to help meet future water demands.

As an Association that promotes water quality and quantity in the Red River basin, we appreciate the need for water conservation, especially in the midst of potential droughts, as this region of Texas has already experienced in the recent past. The Red River Authority of Texas is responsible for providing the water needs of approximately 10,000 customers in the North Texas region within the Red River Basin. It is important to note that Red River Authority of Texas serves rural and underserved populations across North Texas. The distinctive hydrogeological and topographic elements of the Red River Basin provides a vital local resource of surface and ground water that needs to be conserved and protected.

The proposed Advanced Metering Infrastructure Project would provide for the replacement of approximately 3,900 antiquated analog meters with advanced digital metering and radio reading technology. This project enhances local, state, and federal water conservation objectives by measuring water production, usage, and leakage, which will result in quantifiable water and energy savings.

I hope this expression of support is helpful in your consideration of the Red River Authority of Texas application.

Sincerely,

Original Document Signed

Richard Brontoli
Executive Director





RED RIVER AUTHORITY OF TEXAS



**RESOLUTION
No. 2019-004**

STATE OF TEXAS §

COUNTY OF WICHITA §

A RESOLUTION OF THE Board of Directors of the Red River Authority of Texas stating its support of an application with the United States Bureau of Reclamation for a grant under their WaterSMART: Water and Energy Efficiency Grants Program.

WHEREAS, the Red River Authority of Texas is a Conservation and Reclamation District encompassing all of 43 Texas counties located within the Red River Watershed in Texas; and

WHEREAS, periodically the Red River Authority of Texas has an opportunity to accept grant funds available through public or private sources, which funds facilities and programs the Authority would otherwise be required to finance through other sources; and

WHEREAS, acceptance of such grant funds also require the execution of grant agreements and the Board of Directors of the Red River Authority of Texas can legally enter into a grant agreement with the United States Bureau of Reclamation, and

WHEREAS, the United States Bureau of Reclamation is currently soliciting proposals for grant funding assistance under their 2019 WaterSMART: Water and Energy Efficiency Grants Program; and

WHEREAS, the Red River Authority of Texas staff have formulated a project improvement grant proposal, referred to as the Advanced Metering Infrastructure Program, which has the support of surrounding water stakeholders and communities; and would be funded by a combination of the Red River Authority of Texas funds, in-kind services, and Bureau of Reclamation grant funds; and

NOW THEREFORE BE IT RESOLVED, by the Board of Directors as follows:

- A. The Board of Directors has reviewed and supports the grant application to the United States Bureau of Reclamation entitled Advanced Metering Infrastructure Program.
- B. The Red River Authority of Texas is capable of providing the amount of funding and in-kind contributions specified in the application; and
- C. The Red River Authority of Texas will work with the United States Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement.
- D. The Board of Directors will reconvene in a timely manner to enter into an agreement with the United States Bureau of Reclamation, should a grant award be made to the Red River Authority of Texas.

PASSED AND APPROVED this the 2nd day of April, 2019 at a regular meeting of the Board of Directors by a vote of 8 FOR and 0 AGAINST.

Penny Carpenter

Penny C. Carpenter
Secretary-Treasurer

Jerry Bob Daniel

Jerry Bob Daniel
President