WaterSMART: Water and Energy Efficiency Grants for FY2016
Funding Opportunity Announcement No. R16-FOA-DO-004
Funding Group I

City of Big Bear Lake

Department of Water & Power

Advanced Metering Infrastructure Program

Applicant Information: **City of Big Bear Lake**
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SECTION 1. EXECUTIVE SUMMARY

Date	January 20, 2016
Applicant	City of Big Bear Lake Department of Water and Power
City, County, State	Big Bear Lake, San Bernardino, California
Project Name	AMI Meter Replacement Program
Project Length	2 years
Estimated Completion Date	July 1, 2017

The City of Big Bear Lake Department of Water and Power (the DWP, DWP, or the Department), is applying for funding by the United States Bureau of Reclamation's (USBR) WaterSMART: Water and Energy Efficiency Grants for FY 2016 Funding Opportunity Announcement No. R15-FOA-DO-004. The DWP is applying for $300,000 in federal funding assistance for Federal Funding Group I, to implement an Advanced Metering Infrastructure (AMI) Program, which includes the installation of 15,548 new water meters and radios for residential, and commercial users 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 DWP and its customers. The project will provide benefits under the following tasks:

Task A – 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 a natural resource, water, and increase the financial stability of the utility and service reliability. Water conservation will be improved by increasing customer understanding of their water use compared to neighbors, and public education through water audits. Customer leaks caused by frozen pipes will 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. Almost 70% of the DWP's customers are part-time residents, so leaks running for weeks while the customer is away, is common place with conventional meters.

Task B – Energy-Water Nexus – Reduced water use through conservation produces a linear reduction in energy use associated with source production, conveyance, and treatment requirements.

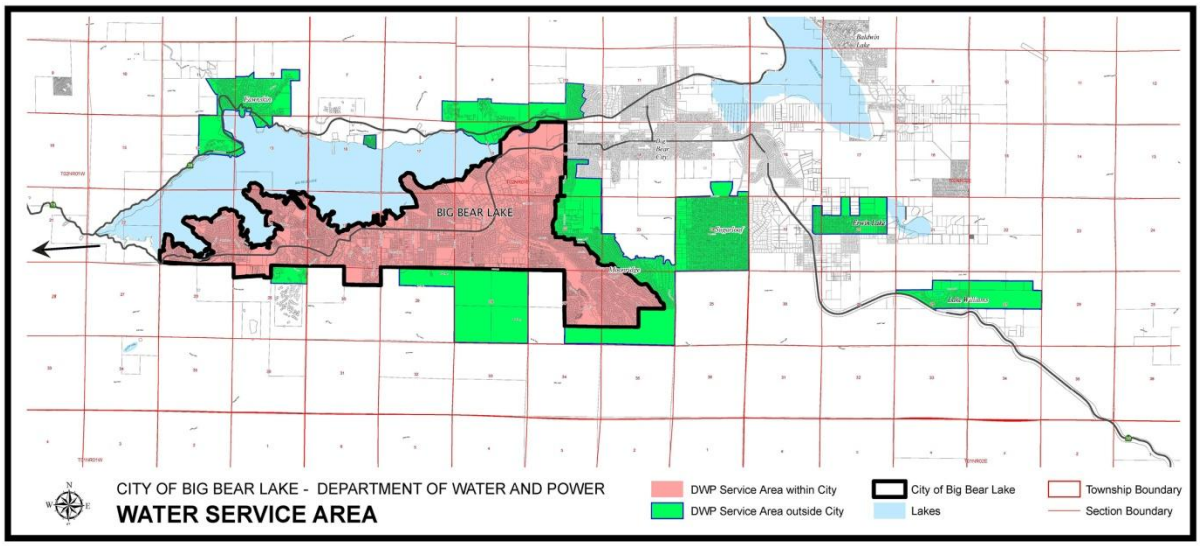
The Project is not located on a Federal facility.

SECTION 2. BACKGROUND DATA

2.1 Location

The DWP's water service area is located within Bear Valley, as depicted in Figure 1. These areas are located in the San Bernardino Mountains in San Bernardino County, California. The DWP's service area is located primarily along the south shore of Big Bear Lake. Fawnskin lies to the north of the lake, and the Sugarloaf-Erwin Lake and Lake William systems are located east of Big Bear Lake. In total, the DWP's service areas encompass approximately 13 square miles.

Figure 1 Water Service Area



2.2 Overview of Water Supply

The DWP produces potable water from groundwater wells. These wells produce water from the Bear Valley Groundwater Basin (DWR designation 8-9). The wells are a combination of horizontal wells (gravity) and vertical wells (pumped). The DWP does not use surface or imported water to meet its water demand. Importing water into the Bear Valley would be extremely costly and is not a viable option. The DWP'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 within the safe yield of the basin, which is 3,100 acre-feet per year (afy). The perennial yield of the basin is estimated at 5,500 afy.

Table No. 1 Current and Projected Demand

Supply Source	Annual Pumping (afy)					
	2010	2015	2020	2025	2030	2035
Groundwater/ Total	2,152	2,095	2,168	2,244	2,323	2,404

Note:

The calculations used for the demands are based on a 0.7% growth in demand each year, beginning in 2015.

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

Customer Class	2015		2020		2025	
	No. of accounts	Demand (afy)	No of Accounts	Demand (afy)	No. of accounts	Demand (afy)
Single-Family	14,682	1,374	15,203	1,422	15,742	1,472
Multi-family	-	-	-	-	-	-
Commercial	866	530	897	549	929	568
Industrial	-	-	-	-	-	-
Government	-	-	-	-	-	-
System Losses	-	191		197	-	204
Total	**15,548**	**2,095**	**16,100**	**2,168**	**16,671**	**2,244**

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

Customer Class	2030		2035	
	No. of accounts	Demand (afy)	No. of accounts	Demand (afy)
Single-Family	16,301	1,524	16,880	1,577
Multi-family	-	-	-	-
Commercial	962	588	996	608
Industrial	-	-	-	-
Government	-	-	-	-
System Losses	-	211	-	219
Total	**17,263**	**2,323**	**17,876**	**2,404**

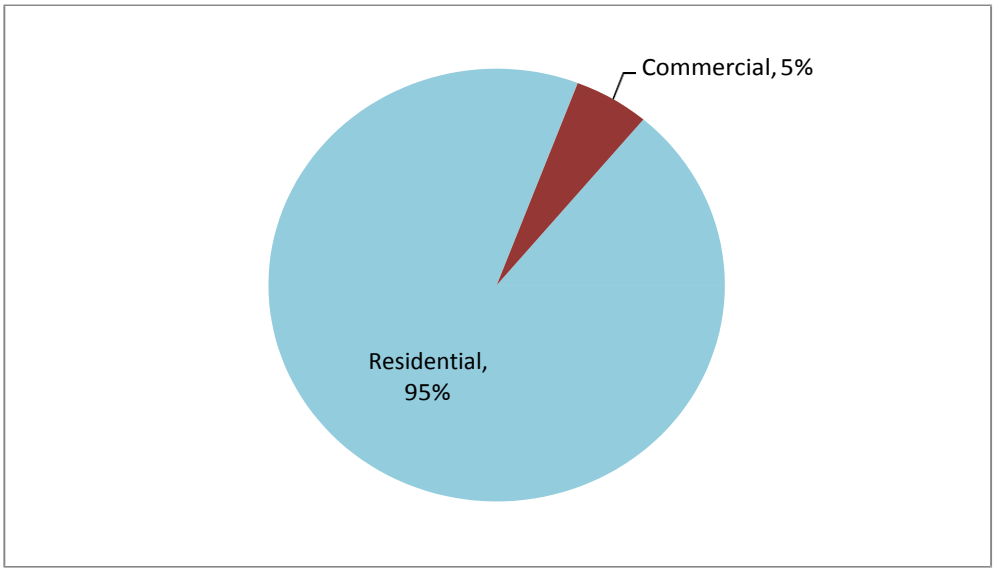
Note:

The calculations used for the demands are based on a 0.7% growth each year, beginning in 2015.

2.3 Current Water Uses

As of 2015, the DWP maintains 15,548 water meters, in which 14,682 are residential and 866 are commercial. Multi-family residential accounts are grouped in commercial accounts. Thus, about 94.4% percent of the accounts are residential (Figure 2).

Figure 2 Customer Account Breakdown



2.4 Water Delivery System Description

The DWP distributes its potable water supply through a distribution system consisting of five water systems with 15 separate pressure zones, 180 miles of pipeline, 33 vertical wells, 22 slant wells, 16 reservoirs, 12 booster stations, 41 pressure reducing valves, 26 chlorination stations, and 22 sample stations.

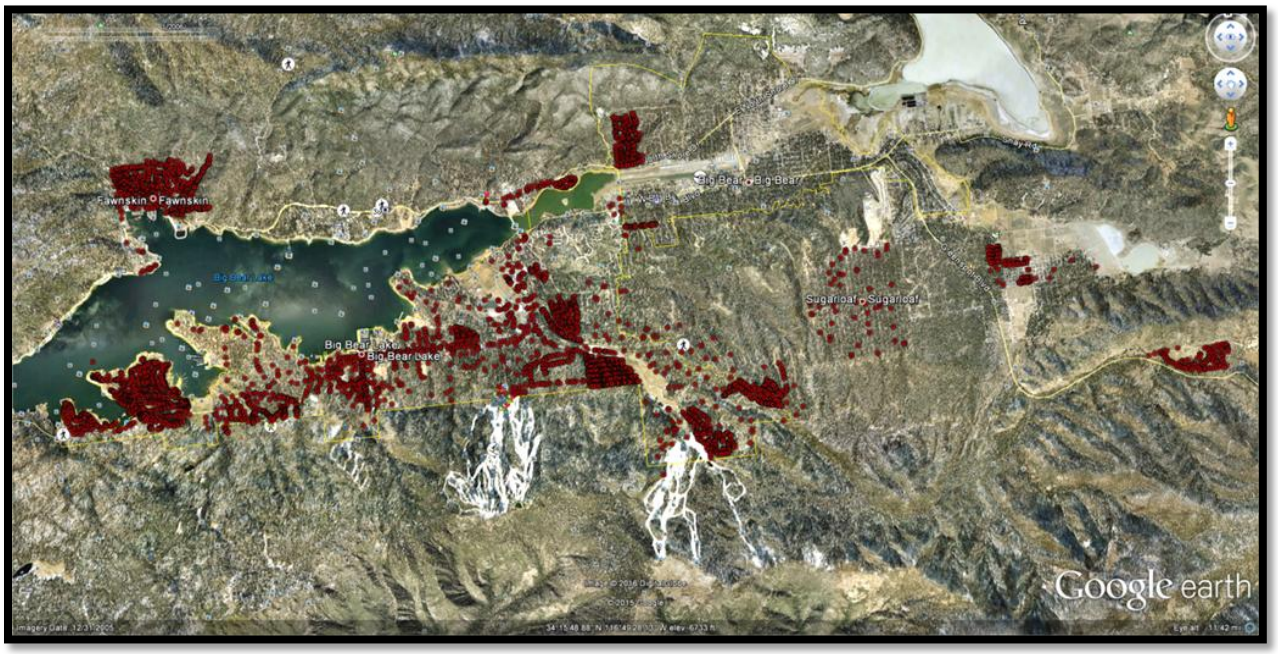
SECTION 3. TECHNICAL PROJECT DESCRIPTION

The DWP has approximately 15,500 meters within its service area. Some of the meters are over 70 years old. The typical warranty on a meter is 10 years on moving parts and 20 years on the meter body.

The DWP has completed random accuracy testing of the meters and found that only 5 meters out of 60 tested passed the 98% accuracy standard. Two of the 60 meters tested were not registering flow due inoperable internal parts. Also during the meter testing program, the DWP's staff estimated that there are potentially 540 such inoperable meters within the system. Because approximately 70% of the DWP's customers are part-time residents, it is not unusual for meters to have no usage for months or even years, so it is difficult to identify these meters.

Based upon the water meter testing data from July 2014, the DWP's Board of Commissioners (the Board) approved an AMI project to replace all of the meters in the system with new meters and radio read technology. The DWP conducted extensive research and testing on eleven different types of meters from five different manufacturers and five different radio read systems. Upon completion of the research and testing, the DWP selected the Sensus Accustream and Omni meters and Sensus 520M MXU radio system (see details in next section). To date about 4,900 meters have been replaced with this technology at a cost of approximately $1 million dollars. Figure 3 shows the location within the DWP service area (areas in red) where the AMI system has been implemented with the remaining areas within the DWP service area to be completed.

Figure 3 AMI Implementation



3.1 The Proposed Project

Upon execution of the contract with the USBR, the DWP will continue to purchase meters at a rate of about 2,500/year and the DWP's staff will continue installation over a two year period (5,000 meters total). 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 in order to analyze user consumption patterns or identify 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; and
- Training requirements.

Selected Equipment:

Meter:

Sensus AccuSTREAM composite meter tested within +/-2% accuracy requirement at low, medium, and high flow rates. During the freeze test, the bottom plate failed, as designed, and was easily and economically replaced. The meter was retested and still met industry standards. Additional information is provided in Section 4.1.

Radio:

Sensus 520M MXU SmartPoint radio transmits meter consumption information to the base station once an hour. This information is sent to the DWP, via the internet and is used to answer customer inquiries, bill the account, 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 DWP will be able to educate customers regarding water use and also identify leaks and other areas where additional conservation may be possible.

The DWP is currently using 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 DWP's staff to respond to the break as quickly as possible. In Big Bear this is particularly important as many homeowners are not full time residents and the freezing conditions make homes more susceptible to ruptures from frozen pipes, 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 DWP can contact the resident to identify the issue and encourage the customer to investigate. In both cases, AMI can save water for the DWP 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. Knowing the amount of water that is being used also helps customers and their chosen contractors get an idea of where a leak may be originating.

- *Time of Day Audits* – In 2004, the City adopted an ordinance restricting outdoor irrigation to April through October and prohibited outdoor irrigation between 9:00 a.m. and 6:00 p.m. for all water users. Evapotranspiration is a calculated estimate of the water that evaporates from soil and plant surfaces and the water plants lose through their leaves. Evapotranspiration rates in this arid mountain region can be as high as 7.06 inches of water loss per month. The AMI system has the ability to provide alerts to the DWP when water uses indicate possible irrigation occurring during prohibited time frames. Violations are generally addressed with friendly visits and written reminders to customers. However, the ordinance does allow the DWP to assess fines to chronic violators.

- *Peak Use Data* – With the DWP's new AMI system, it is possible to educate customers regarding peak usage. For example, the DWP is 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 wells 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 DWP will provide information and resources to help in their efforts to save water.

- *Expanded Public Education* - The DWP has an extensive public education program that includes indoor water conservation surveys, outdoor water conservation surveys, a retrofit on change of service program, hospitality industry outreach, regular radio and newspaper advertising, educational outreach to schools and more. By referencing AMI data, the conservation department can show customers their peak usage times as well as historical or seasonal comparisons. With live data the DWP can modify marketing to notify the community if they are not meeting conservation targets and update them on their progress. The AMI system further extends the potential for public education through the web portal where customers can view their own water use. This feature is especially useful in handling the high rate of second and vacation rental homeowners as it allows them to actively monitor their home. If they detect abnormal activity they can alert the DWP and request a courtesy turn off to immediately stop water waste until they identify the issue

- *Drought and Water Emergency Measures* - In addition to its efforts to achieve long-term water use reductions through conservation, the DWP also has a plan for reducing water consumption in times of drought or other water emergency (such as a line break). The Water Shortage Contingency Plan includes the restriction of water use by large users, stricter enforcement of existing DWP 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.

- *California Senate Bill No. 555 Compliance* - California Senate Bill No. 555 requires each urban retail water supplier, on or before October 1, 2017, and on or before October 1 of each year thereafter, to submit a completed and validated annual water loss audit report. The addition of AMI, and project completion, would greatly assist the DWP in completing the annual audit.

- *Usage Alerts* – Approximately 70% of our customers are part-time residents. Sometimes, these vacant homes get broken into and home invaders live there until they are discovered. 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: Water Conservation

The DWP's long-term water conservation goal is to reduce per capita water use by 20% in accordance with California's Water Conservation Act of 2009 (SBx7-7). This project is a critical component of the City's overall conservation plan. During fiscal year 2001/2002, the DWP produced 3,014 acre feet of water, which was approaching the estimated perennial yield of the DWP's service area of 3,100 AF/year. Importing water into the Bear Valley area is not economically feasible, so the DWP initiated an aggressive water conservation program. These programs have been very successful and by fiscal year 2008/2009, the DWP had reduced its production to 2,345 acre feet, which was a 22% reduction from FY 2001/2002. The DWP has continued its conservation efforts and its water production for FY 2014/2015 was 2,192 acre feet, which is a 6.5% reduction from FY 2008/2009. In order to continue to reduce the DWP's customer's water use and meet its conservation goal to be in compliance with SBx7-7, the DWP implemented an AMI Meter Replacement program in support of the DWP's continuing water conservation efforts.

The DWP began installing Sensus AccuSTREAM composite meters with Sensus 520M MXU radios in October, 2014. The DWP evaluated five different meter manufacturers (eleven different meter models) and five different radio manufacturers. Each meter was tested for accuracy at low, medium, and high flow rates. Staff then filled each meter with water, capped the inlet and outlet and froze the meter for one to two hours and then thawed them out (light freeze). If the frost bottoms broke, they were repaired and then the meters were retested. If the meters tested 98% accurate or better, they were frozen a second time, for about 24 hours (hard freeze). Only the Sensus AccuSTREAM meters passed all of our testing and fortunately it was one of the least expensive meters, so it was selected. The Sensus 520M MXU radio and antenna can be mounted within the meter box, under the lid, and only requires two base stations (collectors), for the DWP's entire service area, to transmit real time meter information to the DWP's office. Because the Sensus 520M MXU radios do not need external antennas and only need two base stations to transmit meter information, the DWP selected the Sensus 520M MXU radio.

The DWP's average water production over the last five years is 2,228 AF/year. The average non-revenue water percentage has been just over 9%. The new AMI meters will provide the DWP real time, hourly usage information, which will assist us in identifying large and small customer leaks. The DWP 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 DWP 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.

Non-revenue water is either used by the customer and it is not measured due to an inaccurate or inoperable water meters, or it percolates into the ground after it leaks from the DWP's water

distribution system or the customer's system. The AMI Municipal Meter Replacement Program will allow the DWP to locate customer leaks within hours. The new accurate meters will enable the DWP to easily identify areas where supply production quantities significantly exceed usage quantities, which will allow us to refine the area in which to search for a water main leak. The above measures will conserve water and reduce the amount of water the DWP pumps from the aquifers.

4.1.1 Subcriterion No. A.1: Quantifiable Water Savings

The DWP's AMI Municipal Metering Replacement Program will reduce non-revenue water by three different quantifiable ways and **will result in 104 acre feet per year in water savings**. 1) The DWP was concerned with the accuracy of its meters and conducted random testing of the meters, which determined an average under-registering of water usage of 3.3% of total production. 2) The DWP'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 2.9%. 3) Approximately 70% of the DWP's customers are part-time residents. During the winter months, customer's pipes freeze and fail causing significant leaks and property damage. Because customers are part-time residents and the DWP has a bi-monthly billing policy, some leaks can run for sixty days or more before being discovered. The estimated unaccounted for water due to customer leaks is 2.3%.

1. **Water Meter Accuracy:** Some of the DWP's meters are over 70 years old and nearly 6,900 of the DWP's conventional meters have exceeded their useful life. Concerned with the accuracy of these aging meters, the DWP conducted two sets of testing to determine if the meters met the industry standard of being accurate within +/- 2%. The first set tested was a stratified selection of sixty-six meters ranging in installation dates of 1940 to 2009. The meters were tested at low, medium, and high flow rates and the average accuracy was determined for each meter. Using fiscal year 2012/2013 billing records for each meter, the revenue lost and water loss was computed. The average water loss for this test set was 3.0% (see Exhibit 1 for complete test results).

   The DWP then randomly selected a statistical sample of 60 additional meters and conducted the same testing methodology. Three of the sixty meters were not registering flow or recently replaced so they were deleted from the data set. Of the remaining 57 meters, 52 meters demonstrated error rates that exceeded the evaluation criterion of +/- 2%. Using the results of this test, we believe, that on average, the DWP's meters are measuring 3.3% low (see Exhibit 2 for complete test results). The two data set results were very similar, which gave the DWP's staff confidence in recommending a meter replacement program. Using the accuracy information from the second data set and fiscal year 2012/2013 water production quantity of 2,410 acre feet, the non-revenue water for fiscal year 2012/2013 was 80 acre feet (2,410 AF * 3.3%).

Table No. 3 Estimated Water losses FY 2012/13 Due to Meter Inaccuracy

Acre Feet Produced	2,410
Estimated loss %	3.3%
Acre Feet Losses FY 2012/13	80

2. **Non-registering Water Meters:** the DWP developed a list of 210 meters that had frozen and were repaired. In May of 2014, 21 of these meters were tested and 14% (3) of them were not registering flow because of inoperable internal parts. Also, of the 126 meters tested above in section 4.1.1 A), 3.2% of them were inoperable. Extrapolating these percentages over the DWP's 15,254 (15,464 meters less 210) meter population, there are an estimated 514 inoperable meters in our system. During fiscal year 2012/2013, the average monthly water usage was 5 CCF's/month. Assuming the estimated 514 meters were not registering flow during fiscal year 2012/2013, the non-revenue water related to stuck meters was 70 acre feet or 2.9%

Table No. 4 Estimated Unaccounted for Water

Number of Meters	Sample Units	Number of Non registering	%	Extrapolated Non registering Meters
210 Frost bottom failures	21 repaired units	3	14.3%	30
15,254 Meters (15,464-210)	126 from stratified and random samples	4	3.2%	484
Estimated # Non-registering Meters				**514**

Table No. 5 Estimated Annual Water Loss Through Non-registering Water Meters

Estimated # Non-registering Meters	514
Average Monthly Consumption	5 CCF
Annual Water Loss	30,855 CCF
Annual Water Loss (AF)	70
% of Annual Production	**2.9%**

3. **Undetected Customer Leaks:** Approximately 70% of the DWP'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. The water in the customer's pipes freeze and the pipes crack and when they thaw-out, severe leaks occur. The DWP has a bimonthly meter reading policy and when there is

significant snow covering the meter box the water usage is estimated, so a leak can go undetected for months. The DWP provides leak adjustments to customers who have unusually high usage due to a leak and provide proof that the leak has been repaired. During fiscal years 2013/2014 and 2014/2015, the DWP provided leak adjustments to 358 customers for 43,758 CCF's or 100 acre feet of water. The production for fiscal years 2013/2014 and 2014/2015 totaled 4,413 AF, from this the DWP estimates that undetected customer leaks accounted for 2.3% of the DWP's production those years.

Table No. 6 Estimated Loss Due to Customer Leaks

Total Production FY 2013/14 (AF)	2,221
Total Production FY 2014/15 (AF)	2,192
Production 7/1/13-6/30/15 (AF)	4,413
Leak Adjustments (AF)	100
Estimated % Production lost to customer leaks	**2.3%**

The new AMI meter system will allow the DWP to identify leaks within hours, rather than days or months. During December of 2015, Bear Valley experienced single digit temperatures and several customers' pipes froze and broke. The DWP has installed almost 4,900 radio read meter installations (almost a third of our customers) and we were able to identify 29 leaks using the AMI system. Many of these affected customers are part-time residents and their homes were vacant. The DWP turned off the water service to the vacant homes with leaks and notified the customers of the issue. If the homes with leaks were not vacant, then the customer was made aware of the leak and is required to repair the leak in a timely manner. Failure to repair the leak will result in the water service being discontinued.

The DWP calculates that 51 AF/year 2,228 AF/year (average water production) * 2.3% (recent percentage of water production adjusted via leak adjustments)] can be conserved when the AMI meters are fully deployed. The assumptions made with this calculation are that the amount of water loss before a reported leak is repaired is understated by the numerous customers that have leaks and repair them without requesting a leak adjustment.

Table No. 7 Water Production Loss through Customer Leaks

5 Year Average Water Production (AF)	2,228
Estimated Production lost to customer leaks	2.3%
Estimated Annual Water Loss due to Customer Leaks (AF)	51

The non-revenue water caused by under-registering old meters or non-registering meters is calculated above at 6.2% (3.3% + 2.9%) of the DWP's annual water production. Even though reducing non-revenue water does not directly result in water conservation, it does have water conservation benefits. The DWP's conservation department sends letters and conducts water audit meetings with customers whose usage exceeds normal usage patterns. Many of our

customers water usage is just below the threshold that would trigger a conversation/outreach effort from the DWP's conservation department. The new meters will accurately measure the customer's usage and the additional 3.3% measured water usage may place these customers into a high usage category resulting in additional conservation information.

When a customer's inoperable meter is replaced, they still use water but now it is measured. During the summer of 2015, the DWP replaced a non-registering meter with a new AMI meter. This customer had significant landscaping and was shocked at the amount of water they were using. The customer adjusted their irrigation times and conserved a significant amount of water once they were aware of the problem. In 2002, when the DWP's water production was approaching the aquifer's perennial yield, our customers were made aware of the problem and water usage was reduced by 22%. If we assume that 10% of our 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 1,925 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. 8 Estimated Customer Conservation in Response to AMI Metering

		Table # or Calculation	
1	# customer with under-registering meters	15,464 * 91.2%	14,108
2	Expected high-users	10% of line 1	1,411
3	# Customer with non-registering meters	Table #2	514
4	# Customers expected to modify usage	Line 2+3	1,925
5	Annual Consumption (CCF)	5 CCF*12* line 4	115,485
6	Annual Consumption (AF)	(Line 5*748)/325,851	265
7	**Expected Annual Conservation (AF)**	**Line 6 * 20%**	**53**

Implementing the online customer portal, along with the AMI Meter Replacement Program will allow customers to check their water usage in-between billing periods thereby allowing them to modify and verify usage more frequently and conserve water. The new AMI meters will notify the DWP and the customer of minor, continuous water usage that could be a small 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 DWP to compare real-time water usage data with real-time water production data, for a specific area of the DWP's service area, which will allow the DWP to identify areas of our 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 104 AF/year [51 AF/year (leak adjustment water savings) + 53 AF/year (under-registering

and non-registering meter water savings)] or 4.7% of average annual production (104 AF/year / 2,228 AF/year). These savings will be verified once the AMI meter replacement project is completed by comparing the current non-revenue water quantity, currently 200 AF/year (2,228 AF/year * 9%), to the non-revenue quantity after the AMI meter replacement project has been completed for one year. We will also compare the average water usage before the AMI meter replacement program, 5 CCF/month, to the average water usage after the AMI meter replacement project has been completed for one year.

Table No. 9 Estimated Annual Conservation

Conservation Related to AMI System	Table #	Acre Feet Conserved
Estimated Annual Water Loss due to Customer Leaks (AF)	Table #5	51
Expected Annual Conservation (AF)	Table #6	53
Total		**104**

4.1.2 Subcriterion No. A.2: Percentage of Total Supply

As calculated above in Table #9, in Section 4.1.1, the Estimated Amount of Water Conserved associated with the meter replacement program is 104 AF/year. The DWP Average Annual Water Supply during the last five fiscal years is 2,228 AF/year. The estimated Percentage of Total Supply conserved is projected at 4.7%.

4.2 Evaluation Criterion B: Energy-Water Nexus

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

During fiscal year 2014/2015 the DWP installed solar panels on its office building. The solar panels provide about 74% of the office building and warehouse building power demand. The solar panels have reduced our power costs by nearly $30,000 per year. The DWP has five wells located at its Division Well Field Site. The DWP has developed a concept for an additional solar project to provide power for these five well pumping plants. The solar field will have approximately four times the number of panels that our recently constructed office solar field has and is expected to produce approximately 550,000 kilowatt hours per year at a total construction cost of $1,200,000.

During the DWP's July 2014 Board meeting the DWP's 5-year Capital Improvement Plan was approved. The Division Well Field Solar Project was not included in the Capital Improvement Plan because of funding restraints. Funding was allocated instead for the AMI Meter Replacement Program in the DWP 5-year Capital Improvement plan. If the AMI Meter Replacement Program is partially funded by a WaterSMART Grant, then revenues that are currently allocated to the AMI program can be reallocated to the Division Well Field Solar Project.

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

The DWP has forty-five well and booster pumping plants that distribute its water supply throughout the Bear Valley. As described in Section 4.1.2 above, the DWP estimates it will reduce its Average Annual Water Supply by 4.7% by fully implementing the AMI Meter Replacement Program. The DWP used 2,044,062 kilowatt hours of power during fiscal year 2014/2015. The reduced pumping resulting from the 4.7% water conserved will result in about 96,070 kilowatt hour per year (2,044,062 kilowatt hours * 4.7%) reduction in DWP power usage. This calculation includes energy for pumping and treating the DWP's water supply.

The DWP estimates that two meter technicians will be reassigned to work on transmission and distribution maintenance crews, which will eliminate the miles driven to manually read the meters. A meter technician averages 9,000 miles per year reading meters. After the AMI Meter Replacement Program is completed, 18,000 vehicle miles per year (9,000 vehicle miles per year * 2 meter technicians) will be reduced.

4.3 Evaluation Criterion C: Benefits to Endangered Species

The DWP pumps from the Erwin Subunit Basin on the east side of the Bear Valley. The US Forest Service determined that the DWP's pumping, along with Big Bear City Community Services District's pumping within the subunit basin has affected the Unarmored Threespine Stickleback Fish (Stickleback) habitat. For years, the DWP has co-funded the pumping of water into the Stickleback pond to maintain their habitat. The reduced pumping resulting from the water conserved as a result of the AMI Meter Replacement Program will help maintain the Stickleback's habitat. The Stickleback is a federally protected endangered species.

4.4 Evaluation Criterion D: Water Marketing

If the DWP's Annual Water Supply continues to be less than the perennial yield of the aquifer within its service area and the Bear Valley receives average rainfall, then eventually the 104 AF/year (see Section 4.1.2 Table #9) of conserved water will find its way into Big Bear Lake via subsurface or stream flow. The Big Bear Lake is managed by the Big Bear Municipal Water District (MWD). MWD has downstream water obligations to entities located in Redlands and San Bernardino. They accomplish meeting these downstream obligations through In-Lieu water transfers and direct releases from Big Bear Lake. So ultimately the 104 AF/year of conserved water will help provide water supply to an entity located outside of the DWP's service area.

4.5 Evaluation Criterion E: Other Contributions to Water Supply Sustainability

4.5.1 Subcriterion E.1: 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 Santa Ana Watershed Basin Study looks at the Santa Ana River Watershed (SARW), including the service area of Big Bear Lake near the headwaters of the Santa Ana River. The Santa Ana Watershed Project Authority (SAWPA) is a water resources planning agency tasked with protecting the water quality of the watershed. The specific adaptation strategy addressed by this proposal is to reduce demand, described as "Promote the State's 20x2020 Water Conservation Plan in the watershed." By reducing demand we help to address three vulnerabilities: water supply, water quality and the ecosystem.

The Basin Study states that, "In light of climate change, prolonged drought conditions, potential economic growth, and population projections, a strong concern exists to ensure an adequate water supply will be available to meet SARW's future water demands." Examples of proposed actions include: Urban Water Use Efficiency (decreasing per capita use), Improved Conveyance Systems (increased efficiency and the reduction of greenhouse gas emissions, Groundwater Management (reduce demand, increase local supplies, and reduce summertime pumping).

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

The Basin study states that "Conservation of existing water supplies is of utmost importance to a growing population in the SARW." By implementing the AMI system and controlling water loss as well as waste, the grant project will help to achieve the adaptation strategy. By implementing the AMI technology the DWP will be able to actively monitor customer's use and utilize the customer interface to notify them when there are periods of peak demand. We 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 DWP to better manage our 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.).**

While the DWP does work with SAWPA on the Integrated Regional Water Management Plan it did not play a vital role in the Basin study.

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

By implementing the AMI technology the DWP is prepared to share the results with other SAWPA member agencies and contributors. We look forward to the opportunity to share our 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.

4.5.2 Subcriterion E.2: Expediting Future On-Farm Irrigation Improvements

This is not applicable to the project.

4.5.3 Subcriterion E.3: 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.**

Twice annually the DWP holds a Technical Review Team (TRT) committee meeting to review and evaluate the status, condition, and availability of the DWP's Ground Water supplies and recommend and advise the Board concerning conservation and other significant resource management constraints, including any possible declarations of a Water Shortage Emergency. The first meeting considers the state of the water supply prior to the summer high use period, and the second meeting is to evaluate impacts on supplies of the summer pumping period and compare annual well production to available Perennial Yield. The TRT was established in 2003 when, during that severe drought, the DWP's water production was approaching its perennial yield and the impacts were apparent in pumping operations.

- **Describe the severity and duration of drought conditions in the project area.**

The Bear Valley is in its fourth year of severe drought. The annual rainfall, measured at the Big Bear Dam, has been below average for the last four years. While Big Bear Lake is not a source of supply for the DWP, the lake level is indicative of drought conditions. As of January 4, 2016 the lake level was down 14.58' from full. Lake levels have been steadily dropping since May of 2011.

- **Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought.**

At the April 28, 2015 TRT Committee meeting the DWP discussed the fact that precipitation at the dam from July 1, 2014 through March 31, 2015 was 21.98 inches and 68% of the 129-year annual precipitation average. However, as a result of keen- conservation measures and community efforts, at the November 13, 2015 TRT meeting data from monitoring wells showed that basin management efforts have been effective and no particular sub-basins were in immediate danger of a water shortage.

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

The Big Bear City Community Services District (CSD, the other water purveyor in the Bear Valley) can also benefit from the AMI Meter replacement project. The two base stations that collect and transmit meter data to the DWP can also be used by CSD. The DWP and CSD staffs have discussed the possibility of sharing the two base stations. CSD already uses touch pad Sensus meters and they would only need to add radios to the touch pad to convert their system into an AMI system.

Part of the DWP's water supply is from slant wells (horizontal wells) and the slant well production has declined or stopped completely during this drought. The water conserved from the AMI Meter Replacement Program will help offset the decreased production of the DWP's slant wells. There is also wide spread support (see attached letters of support in Section 11) for this project that helps water sustainability in the Bear Valley. Part of the DWP's service area includes rural, economically disadvantaged communities.

- **Will the project make water available to address a specific concern? For example:**
    - **Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?**

      Yes, as described in the Santa Ana Basin Study report, the DWP groundwater basins, 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.

- **Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.**

From the Santa Ana Basin Study- "Climate change is projected to affect many aspects of water resources management in the SARW" 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

- **Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?**
  No

- **Will the project make additional water available for Indian tribes?**
  No

- **Will the project make water available for rural or economically disadvantaged communities?**
  Yes, according to the Santa Ana Basin Study Summary Report a large portion of the DWP service area is a disadvantaged community. By giving these customers the ability to actively monitor their use we are providing the tools to help them conserve water as much as possible. In addition, these customers will also possibly financially benefit from early leak detection and notification.

- **Does the project promote and encourage collaboration among parties?**
  Yes, The Big Bear City Community Services District (CSD, the other water purveyor in the Bear Valley) can also benefit from the AMI Meter replacement project. The two base stations that collect and transmit meter data to the DWP can also be used by CSD. DWP and CSD staffs have discussed the possibility of sharing the two base stations. CSD already uses touch pad Sensus meters and they would only need to add radios to the touch pad to convert their system into an AMI system.

- **Is there widespread support for the project?**
  Yes, as evidenced by letters of support from our Assemblyman, Congressman, and a local agency (see Letters of Support).

- **What is the significance of the collaboration/support?**
  The DWP is at a critical point in our history. We have brought our system into the 21st century but now it is time for our agency to take a more active part in regional water management, with our neighbors at the CSD and as a stakeholder in the SAWPA region. By leading the charge for AMI we hope to be a test case in best management practices for a small water system.

- **Will the project help to prevent a water-related crisis or conflict?**
  No

- **Is there frequently tension or litigation over water in the basin?**
  No

- **Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?**
  Yes, as mentioned before, further water conservation could be achieved by the customers of our neighboring CSD if they convert their system to AMI and utilize our base stations.

- **Will the project increase awareness of water and/or energy conservation and efficiency efforts?**
  Yes

- **Will the project serve as an example of water and/or energy conservation and efficiency within a community?**
  Yes

- **Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?**
  Yes

- **Does the project integrate water and energy components?**
  By reducing demand the DWP anticipates there will be a reduced demand for electricity used for pumping. By utilizing the AMI system there will be a reduced need for meter readers to drive throughout the community to read meters, leading to a reduction in greenhouse gas emissions.

4.6 Evaluation Criterion F: Implementation and Results

4.6.1 Subcriterion No. F.1: Project Planning

The DWP's Board of Commissioners adopted a Five-Year Capital Improvement Plan during the July 22, 2014 Board Meeting (staff report and minutes attached as Exhibit 3). The AMI Meter Replacement Program is the largest project within the approved Five-Year Capital Improvement Plan. The AMI meters will provide hourly usage information, leak alerts, eliminate estimating meter reads during heavy snow events, and allow customers access to their usage information (via the customer portal). Once all of the meters are installed, the DWP will be able to customize the conservation efforts, identify problem leak areas, and develop plans for future facilities more efficiently.

4.6.2 Subcriterion No. F.2: Readiness to Proceed

The DWP has completed the research and product selection for the AMI system and funded the initial phase of the implementation plan. Upon entering into a financial assistance agreement with the Bureau of Reclamation, the DWP will be able to proceed with the purchase and installation of additional AMI meters as identified in the AMI Meter Replacement Program approved in July 2014.

The following is a summary of the implementation plan:

1) Install the Sensus AMI network (2 collectors), which will read all of the DWP's meter locations. Collectors to be installed by Sensus contractor.
2) The DWP's staff will replace the 1,525 Itron 200W radios with Sensus 520M MXU radios using adaptors.
3) The DWP will select areas that are remote from the DWP's office (Fawnskin, 700 connections). The DWP will select routes that have a history of repeated estimated usage. During the winter months, the DWP will select routes that have minimal snow coverage so that the change out program can continue through the winter.

4) The DWP's staff will modify or replace the existing meter box so that it is a minimum of three feet deep, install a 4-inch diameter by 1 foot deep pipe below the meter and install an insulation pad above the new meter. The radio will be installed below the meter box lid. The DWP will then program the radio and modify the radio location if radio reception is an issue.
5) 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 DWP's staff plan on completing this project in six years.

By June 30, 2015, implementation of the AMI Meter Replacement Program was ahead of schedule. The Sensus contractor installed both base stations. The DWP staff replaced 1,525 Itron 200W radios with Sensus 520M MXU radios. The DWP staff replaced 1,775 conventional meters with Sensus radio read meters. The winter of 2014/2015 was mild, which allowed the DWP to install more radio read meters than originally estimated. As of January 1, 2016, nearly 4,900 radio read meters have been installed. Assuming normal weather condition for the remainder of this project, the DWP estimates that they can install 2,500 radio read meters per year. At that rate, the AMI Meter Replacement Program will be fully implemented by April of 2020, slightly ahead of schedule.

4.6.3 Subcriterion No. F.3: Performance Measures

The AMI Meter Replacement Program will assist the DWP'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 man-hours and vehicle miles. Once the AMI Meter Replacement Program is fully implemented for one year, the DWP will compare the non-revenue water quantity before and after project completion. The DWP will compare the quantity of water associated with customer leak adjustments before and after project completion. The DWP will then compare the use-per-capita before and after project completion to determine the effectiveness of the improved conservation information. The DWP will also compare employee and vehicle expenses related to meter reading before and after project completion.

4.6.4 Subcriterion No. F.4: Reasonableness of Costs

The State has mandated that the DWP reduce its water production by 16% by February 2016. We expect the State to continue its efforts to reduce water use throughout the State and therefore the DWP needs to implement a strategy to reduce production on a long-term basis. The DWP already has an extensive water conservation program that has been in place for over a decade and has reduced water production by 27.5% since 2002. Still the DWP must endeavor to reduce production another 16% or face steep fines from the State of California. Consumption per capita for the DWP's customers for the 12-months ending November 30, 2015 averaged only 55 gallons per day. The DWP can and will continue in its efforts to reduce consumption, however, if the DWP 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

Department's ability to do so. The DWP seeks to deploy an online portal that customers can use to monitor their own consumption. With this ability in place the new system could alert the DWP customers to potential leaks at their properties that might otherwise go un-detected.

Sensus provided a 20-year warranty on the meter register and radio (see Exhibit 4).
The average cost per acre foot of water produced is $290. Over the 20-year life of the meters, the DWP would realize $603,200 in savings related to the reduction in production of 104 AF per year water production at today's cost. A cost benefit of the AMI Meter Replacement Project is the increase in revenue related the additional 3.3% of usage that will be registered through the new meters. During the existing meter testing program, the DWP staff estimated that the DWP under-billed its customers $102,069/year (see Exhibit 2) due to the meters under registering usage. The DWP will realize an estimated benefit of $2,041,380 in additional revenue over the 20-year life of the AMI meters.

Table No. 10 Cost of Materials

Component	Cost/unit	Units/Year	Duration In years	Total Material Cost
Sensus 5/8" Meter with SMARTpoint	$ 189	2,300	2	$ 869,400
Sensus 1" Meter with SMARTpoint	237	200	2	94,800
Frost Mat	20.78	2,500	2	103,900
Mounting bracket	2.68	2,500	2	13,400
Material Cost	212.46			1,081,500
Labor				500,000
Customer Portal Integration	24,500	1	1	24,500
Total Project Costs				$ 1,606,000

The estimated internal labor cost to install the meter components over the two-year period is approximately $500,000. Using internal labor to install the meters will not require any increase in staffing or labor costs to the DWP. The installation will be accomplished by re-prioritizing other maintenance projects.

4.7 Evaluation Criterion G: Additional Non-Federal Funding

Non-federal funding will represent 81.3% of the total project costs.

The DWP is requesting $300,000 in federal funding to facilitate deployment of 5,000 radio read meters throughout the DWP's service area. The DWP will be matching this federal funding first by using in-house labor funded through operating revenues of $500,000. Secondly, the DWP is applying for funding from the California State Revolving Fund for Drinking Water. The remainder of project costs will be funded from revenues and/or capital improvement reserves.

4.8 Evaluation Criterion H: Connection to Reclamation Project Activities

The DWP is one of four agencies in the Bear Valley that are developing a comprehensive facility plan for the Bear Valley Water Sustainability Plan (BVWSP). The BVWSP is a proposed reclamation project that will take secondary treated waste water from the existing regional treatment plant, treat it to tertiary quality standards and distribute it throughout the Bear Valley to off-set potable water uses. The hourly AMI usage information can be used to accurately estimate the irrigation demand for each area of the DWP's service area. This information can then be used to determine where distribution facilities of the reclamation project should be constructed to provide irrigation reclaimed water to the areas where the demand is the highest.

SECTION 5. PERFORMANCE MEASURES

The DWP is committed to excellence and improving the water use efficiency within the DWP service area. It is the goal of the DWP 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. Some of these performance measures include:

1. Conducting a water loss audit periodically using the AWWA methodology, which includes:
2. Identifying and quantifying the number of line breaks on a monthly basis;
3. Estimating and quantifying the average gallons of water loss due to each line break incident;
4. Identifying and quantifying the number of leaks repaired each month;
5. Quantifying the water consumption by customer class each month; and

The DWP provides monthly data reports on water production and consumption, and determine nonrevenue water percentages. The most recent water loss audit was completed for fiscal year ending 2014/2015. The DWP has a clear baseline of historical water distribution and billing data to compare with current and future records once AMI has been installed. The DWP is very interested in monitoring and analyzing the performance measures for this project as it will help identify what changes and improvements needed to be made over the course of the project. The DWP has also begun to actively monitor and analyze energy efficiency throughout DWP operations, and further analyses will be performed after implementation of this project to determine any realized savings and benefits from the use of AMI technology.

It is the goal of the DWP 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 DWP 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.

5.1 Performance Measure No. A.2: Measuring Devices

Measuring Devices: a. Municipal Metering

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 DWP has a bi-monthly, multi-tiered, inclining block rate which includes a bimonthly service charge (first 8 CCF's are included) and a tiered structure for usage in excess of 8 CCF's. The DWP currently has an adopted rate plan which includes 2% increases in base fees and volumetric rates on July 1, 2016 and July 1, 2017. Rates will be reviewed in early 2018, however the DWP expects that any increases will be consistent with the previous 2% annual increases.

  #### Residential Rates

  Service Charges:

  The residential bimonthly service charge for 5/8" meters is $87.66.
  The residential bimonthly service charge for 1" meters is $156.92.
  Service charge base rate: 0-8 ccfs are included in the minimum bill.

Table No. 11 Volumetric Charges:

Hundred Cubic Feet (CCF)	Charge per CCF
0-8	Included in service charge
9-24	$2.64
25-40	$3.67
41-60	$5.47
61-100	$9.31
101+	$12.53

5.2 Performance Measure No. B: Projects with Quantifiable Energy Savings

5.2.1 Performance Measure No. B.2: Increasing Energy Efficiency in Water Management

The DWP has forty-five well and booster pumping plants that distribute its water supply throughout the Bear Valley. As described in Section 4.1.2 above, the DWP estimates it will reduce its Average Annual Water Supply by 4.7% by fully implementing the AMI Meter Replacement Program. The DWP used 2,044,062 kilowatt hours of power during fiscal year 2014/2015. The reduced pumping resulting from the 4.7% water conserved will result in about 96,070 kilowatt hour per year (2,044,062 kilowatt hours * 4.7%) reduction in DWP power usage. This calculation includes energy for pumping and treating the DWP's water supply.

The DWP estimates that two meter technicians will be reassigned to work on transmission and distribution maintenance crews, which will eliminate the miles driven to manually read the meters. A meter technician averages 9,000 miles per year reading meters. After the AMI Meter Replacement Program is completed, 18,000 vehicle miles per year (9,000 vehicle miles per year * 2 meter technicians) will be reduced.

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 DWP 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 DWP's water system was constructed during the 40's, 50's, and 60's. The City of Big Bear Lake acquired the water system from Southern California Water Company and has made over $65,000,000 in improvements since 1989.

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

   No, 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 nonnative 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 DWP and will be executed in a timely and efficient manner. Final approval from the DWP Board of Commissioners was received on July 22, 2014.

7.1 NEPA - National Environmental Policy Act

The DWP 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 11. ATTACHMENTS

Exhibit 1. Meter Testing Set by Installation Date

Service, Quality, Community

WSC Water Systems Consulting, Inc.

Exhibit 2. Meter Testing Set: Statistically Random (Left)

CCFS REGISTERED FISCAL YEAR 2013 FOR EACH BILLING RED = ESTIMATED

	Account #	Meter #	Install Date	Meter Size	Service Address	1	2	3	4	5	6	7	8	9	10	11	12	PASS OR FAIL	METER EXCHANGE	WORK ORDER #
1	102014000	56837457	10/24/1997	5/8" 4 spin	402 HIGHLAND/SGLF	-	-	-	-	11	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22697
2	041048000	27124526	11/10/1983	5/8" 3 spin	462 MORENO AV	1	2	1	2	1	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22700
3	001094000	36128339	5/7/1996	5/8" 4 spin	182 HIGHLAND/SGLF	-	2	1	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	PASS	NO	22705
4	102911000	03128182	9/18/2000	5/8" 4 spin	435 MORENO AV	-	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22725
5	001179000	29189818	7/15/2002	5/8" 4 spin	318 HIGHLAND/SGLF	-	1	2	1	5	182	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22732
6	100056000	25278206	12/4/2001	5/8" 3 spin	2176 5TH LANE	6	9	16	-	16	64	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22677
7	042703000	04082976	5/31/2001	5/8" 4 spin	2179 6TH LANE	3	2	3	1	3	4	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22708
9	100604000	06432133	5/30/2007	5/8" 4 spin	600 COVE DR	6	24	1	46	23	9	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22707
10	100930000	06720287	12/1/2005	5/8" 4 spin	368 PULASKI RD	4	11	2	13	18	3	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22720
11	004356000	08169013	3/13/2000	5/8" 4 spin	269 KERN AVE	20	17	16	11	8	18	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22685
12	021391000	57205545	8/14/2000	5/8" 4 spin	674 MAPLE LN	2	1	-	-	1	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22712
13	003896000	01037573	8/21/1998	5/8" 4 spin	170 SAN BERNARDINO AV	-	-	2	2	2	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22734
14	043792000	09002068	8/2/2002	5/8" 4 spin	177 KNOLL DR	60	77	44	29	22	18	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22682
15	009401000	00479172	10/24/2000	5/8" 4 spin	890 EUREKA DR	-	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	YES	22680
16	007980000	54031924	10/29/1980	5/8" 4 spin	40055 SIERRA TRAIL	-	-	1	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22695
17	102034000	46678266	9/7/1989	5/8" 4 spin	619 GEORGIA ST	-	-	1	14	7	4	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22719
18	043095000	03035405	12/14/1988	5/8" 4 spin	1056 EAGLE MTN DR	14	12	13	12	14	13	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22689
19	017648000	54031923	8/29/1983	5/8" 4 spin	1030 DIVISION DR	21	15	14	10	2	8	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22706
20	009695000	50597681	5/6/1996	5/8" 4 spin	43255 SAND CANYON	-	-	-	2	6	1	N/A	N/A	N/A	N/A	N/A	N/A	PASS	NO	22676
21	010152000	33241431	3/21/2000	5/8" 4 spin	43667 RIDGECREST DR	-	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22683
22	009554000	56550347	3/4/2004	5/8" 4 spin	43223 SUNSET/BBL	2	1	1	-	2	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22693
23	103600000	09708423	9/15/2009	5/8" ECR 4	43136 SHEEPHORN RD	26	24	6	12	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22713
24	034235000	55920645	1/24/1997	5/8" 4 spin	43627 RIDGECREST DR	8	6	4	-	3	1	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22715
25	013406000	02061658	9/19/2008	5/8" 4 spin	359 STARLIGHT	35	22	19	1	-	14	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22704
26	035279000	02061654	6/30/2004	5/8" 4 spin	481 STARLIGHT CIR	19	18	8	20	16	12	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22726
27	015125000	34980005	10/20/1983	5/8" 4 spin	1501 TUOLUMNE RD	-	2	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22686
28	032326001	49915941	7/12/2001	5/8" 4 spin	1035 BUTTE AV	2	3	1	11	5	2	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22702
30	101168000	49579689	7/6/2001	5/8" 4 spin	991 ALPINE WAY	10	8	11	6	5	10	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22716
31	019497001	07036072	12/19/1975	5/8" 4 spin	782 HOLMES LN	-	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22678
32	038967000	52986773	7/17/2002	5/8" 4 spin	722 MORENO AV	-	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22694
33	020012000	47829080	6/10/2002	5/8" 4 spin	604 VICTORIA LN	2	-	2	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22696
34	034835002	02078573	9/29/1980	5/8" 4 spin	680 HIGHLAND/SGLF	2	4	2	2	2	4	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22728
35	022168000	08090984	6/12/1996	5/8" 4 spin	515 WAYNOKA LN	4	2	-	1	1	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22699
36	022746000	46297481	8/9/1991	5/8" 4 spin	40226 GUINAN LN	16	19	8	3	1	15	N/A	N/A	N/A	N/A	N/A	N/A	PASS	NO	22703
37	022500000	33410966	7/7/2000	5/8" 4 spin	611 TALMADGE RD	-	-	-	1	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22721
38	021005000	36133336	5/30/2008	5/8" 4 spin	451 EDGEMOOR RD	3	1	-	-	2	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22735
39	023886000	56783291	5/17/1995	5/8" 4 spin	40185 MILLCREEK RD	-	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22684
40	039192000	11514833	8/11/1998	5/8" 4 spin	523 TIMBER LN	-	2	2	1	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22723
41	033378000	01037519	8/22/2006	5/8" 4 spin	380 CONKLIN RD	1	-	-	1	10	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22688
42	100156000	04030652	8/14/1997	5/8" 4 spin	42084 SNOWMASS LN	13	10	10	8	25	13	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22698
43	033820000	49991875	8/15/1994	5/8" 4 spin	41398 EASTWOOD RD	7	7	2	18	69	1	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22709
44	026160000	52542651	8/2/1995	5/8" 4 spin	209 EAGLE DR S	-	2	4	-	5	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22730
45	012234000	48818926	8/8/2013	5/8" 4 spin	42580 CONSTELLATION DR	9	1	-	-	-	1	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22681
46	102159000	51713473	12/17/1992	5/8" 4 spin	42923 FALLS RD	28	7	-	1	1	-	N/A	N/A	N/A	N/A	N/A	N/A	PASS	NO	22687
47	012898000	55920696	9/25/2001	5/8" 4 spin	127 MARINA POINT DR	45	23	6	7	5	28	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22690
48	043020000	17129716	9/22/1988	5/8" 3 spin	1298 BALSAM DR	3	5	10	3	17	9	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22711
49	103144000	55920690	9/6/1991	5/8" 4 spin	41821 GARSTIN DR	-	-	1	-	12	1	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22733
50	039371000	33869256	12/22/2011	5/8" 4 spin	42775 PEREGRINE AV	20	20	5	14	17	42	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22691
51	027728000	06546447	7/31/1992	5/8" ECR 4	42735 MOONRIDGE	20	1	4	13	6	4	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22731
52	103420000	08046202	9/1/2005	5/8" 4 spin	42677 CEDAR/BBL	1	1	5	2	4	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22736
54	034457000	55920708	8/8/2003	5/8" 4 spin	1137 RIDGE RD	54	36	19	7	14	35	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22717
55	033166000	28991102	3/23/2000	5/8" 4 spin	1176 CRAGS LN	4	-	2	-	8	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22718
56	029493000	52826209	9/21/1983	5/8" 4 spin	39305 MOHAWK DR	1	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22729
57	103090000	01066115	7/2/1998	5/8" 4 spin	42823 SONOMA DR	9	14	3	3	1	11	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22722
58	031311000	36133323	1/17/1994	5/8" 4 spin	43082 GRIZZLY RD	2	2	1	3	3	2	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22724
59	025573000	28991078	3/24/2000	5/8" 4 spin	336 KNIGHT AV	18	16	18	12	13	8	10	14	13	16	15	21	FAIL	YES	22701
60	011350000	02014110	4/21/1991	1 1/2" ECR 5	129 OLYMPIC DR #29	34	32	35	29	34	16	50	20	42	25	21	38	PASS	NO	22714
					Totals	535	462	306	322	420	553	60	34	55	41	36	59			
					Total Usage	2883						Percent Struck:		3.33%						
					Average Monthly Usage	4.21						Percent Passing:		8.33%						
					12/13 FY Avg Usage	5.64														
Stuck meter detected in this testing process																				
Stuck meter replaced recently and no usage registered																				
8	005745000	28511264	4/1/2009	5/8" 4 spin	2050 5TH LANE	0	0	0	3	1	3	N/A	N/A	N/A	N/A	N/A	N/A	Stuck Meter	YES	22727
29	042767000	01080792	9/15/2009	5/8" 4 spin	617 VILLA GROVE	1	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	Stuck Meter	YES	22710
53	039796000	04115779	8/7/1991	5/8" 4 spin	39737 FLICKER RD	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	FAIL	NO	22692
					Totals	1	0	0	3	1	3									
					Total Usage	8														

Exhibit 2. Meter Testing Set: Statistically Random (Right)

										2% or more is failing									
LOW READ	MED READ	HIGH READ	NORMAL READ	LOW ERROR (Gal.)	MED ERROR (Gal.)	HIGH ERROR (Gal.)	NORMAL ERROR (Gal.)	TOTAL ERROR (Gal.)	LOW ERROR (%)	MED ERROR (%)	HIGH ERROR (%)	NORMAL ERROR (%)	AVERAGE ERROR (%)	CURRENT 2013 BILL	ADJUSTED 2013 BILL	2013 LOST REVENUE	MEASURED 2013 USAGE (CCF)	ADJUSTED 2013 USAGE (CCF)	2013 LOST WATER (Gal.)
9.7	9.4	9.0	8.6	0.225	0.225	0.3	0.3	1.05						$ 495.27	$ 496.21	$ 0.94	11	11	288
9.7	9.4	8.8	8.4	0.225	0.225	0.45	0.3	1.2						$ 487.92	$ 487.92	$ -	7	7	209
10.0	10.1	10.0	9.9	0	-0.075	0.075	0.075	0.075	0.00%	-1.00%	1.00%	1.00%	0.25%	$ 487.92	$ 487.92	$ -	3	3	6
10.0	9.8	9.4	8.8	0	0.15	0.3	0.45	0.9	0.00%	2.00%				$ 487.92	$ 487.92	$ -	-	-	-
9.4	9.1	8.7	8.7	0.45	0.225	0.3	0	0.975				0.00%		$ 1,969.34	$ 2,038.01	$ 68.67	191	197	4,643
10.0	9.9	9.7	9.5	0	0.075	0.15	0.15	0.375	0.00%	1.00%	2.00%	2.00%	1.25%	$ 758.01	$ 765.95	$ 7.94	111	112	1,038
10.1	9.8	9.6	9.3	-0.075	0.225	0.15	0.225	0.525	-1.00%		2.00%		1.75%	$ 487.92	$ 487.92	$ -	16	16	209
9.9	9.4	9.0	8.6	0.075	0.375	0.3	0.3	1.05	1.00%					$ 690.34	$ 704.10	$ 13.76	109	113	2,854
9.4	9.0	8.6	8.2	0.45	0.3	0.3	0.3	1.35						$ 532.02	$ 536.65	$ 4.63	51	53	1,717
9.9	9.6	9.1	8.9	0.075	0.225	0.375	0.15	0.825	1.00%			2.00%	2.75%	$ 590.82	$ 596.88	$ 6.06	90	92	1,851
9.9	9.6	9.3	9.3	0.075	0.225	0.225	0	0.525	1.00%			0.00%	1.75%	$ 487.92	$ 487.92	$ -	4	4	52
9.7	9.2	8.8	8.2	0.225	0.375	0.3	0.45	1.35						$ 487.92	$ 487.92	$ -	6	6	202
9.6	9.4	9.0	8.5	0.3	0.15	0.3	0.375	1.125		2.00%				$ 1,248.92	$ 1,307.61	$ 58.69	250	259	7,013
9.8	9.5	9.1	8.7	0.15	0.225	0.3	0.3	0.975	2.00%					$ 487.92	$ 487.92	$ -	-	-	-
9.9	9.6	9.4	9.3	0.075	0.225	0.15	0.075	0.525	1.00%		2.00%	1.00%	1.75%	$ 487.92	$ 487.92	$ -	1	1	13
9.9	9.6	9.4	9.3	0.075	0.225	0.15	0.075	0.525	1.00%		2.00%	1.00%	1.75%	$ 502.62	$ 503.22	$ 0.60	26	26	340
9.8	9.6	9.2	8.9	0.15	0.15	0.3	0.225	0.825	2.00%	2.00%			2.75%	$ 561.42	$ 566.68	$ 5.26	78	80	1,604
9.9	9.6	9.4	8.9	0.075	0.225	0.15	0.375	0.825	1.00%		2.00%		2.75%	$ 556.52	$ 561.10	$ 4.58	70	72	1,440
10.2	10.2	10.1	10.0	-0.15	0	0.075	0.075	0	-2.00%	0.00%	1.00%	1.00%	0.00%	$ 487.92	$ 487.92	$ -	9	9	-
9.5	9.0	7.9	7.5	0.375	0.375	0.825	0.3	1.875						$ 487.92	$ 487.92	$ -	-	-	-
9.9	9.3	9.0	8.6	0.075	0.45	0.225	0.3	1.05	1.00%					$ 487.92	$ 487.92	$ -	6	6	157
10.0	9.9	9.0	8.8	0	0.075	0.675	0.15	0.9	0.00%	1.00%	9.00%	2.00%	3.00%	$ 582.92	$ 588.90	$ 5.98	68	70	1,526
9.7	9.4	8.9	8.5	0.225	0.225	0.375	0.3	1.125						$ 487.92	$ 488.66	$ 0.74	22	23	617
9.8	9.5	8.9	8.5	0.15	0.225	0.45	0.3	1.125	2.00%					$ 640.47	$ 649.99	$ 9.52	91	94	2,553
9.9	9.4	9.1	9.0	0.075	0.375	0.225	0.075	0.75	1.00%			1.00%	2.50%	$ 598.17	$ 603.87	$ 5.70	93	95	1,739
10.0	9.7	9.3	9.0	0	0.225	0.3	0.225	0.75	0.00%				2.50%	$ 487.92	$ 487.92	$ -	2	2	37
9.9	9.7	9.1	9.0	0.075	0.15	0.45	0.075	0.75	1.00%	2.00%		1.00%	2.50%	$ 495.27	$ 495.94	$ 0.67	24	25	449
9.9	9.6	9.3	9.1	0.075	0.225	0.225	0.15	0.675	1.00%			2.00%	2.25%	$ 505.07	$ 507.22	$ 2.15	50	51	842
9.4	9.0	8.6	8.3	0.45	0.3	0.3	0.225	1.275						$ 487.92	$ 487.92	$ -	-	-	-
9.8	9.6	9.3	8.9	0.15	0.15	0.225	0.3	0.825	2.00%	2.00%			2.75%	$ 487.92	$ 487.92	$ -	-	-	-
9.8	9.6	9.6	9.6	0.15	0.15	0	0	0.3	2.00%	2.00%	0.00%	0.00%	1.00%	$ 487.92	$ 487.92	$ -	4	4	30
10.0	9.9	9.5	9.3	0	0.075	0.3	0.15	0.525	0.00%	1.00%		2.00%	1.75%	$ 487.92	$ 487.92	$ -	16	16	209
10.1	10.0	9.8	9.6	-0.075	0.075	0.15	0.15	0.3	-1.00%	1.00%	2.00%	2.00%	1.00%	$ 487.92	$ 487.92	$ -	8	8	60
10.1	10.0	9.9	10.0	-0.075	0.075	0.075	-0.075	0	-1.00%	1.00%	1.00%	-1.00%	0.00%	$ 551.62	$ 551.62	$ -	62	62	-
9.8	9.4	9.0	8.5	0.15	0.3	0.3	0.375	1.125	2.00%					$ 487.92	$ 487.92	$ -	1	1	28
9.8	9.4	9.2	8.6	0.15	0.3	0.15	0.45	1.05	2.00%		2.00%			$ 487.92	$ 487.92	$ -	6	6	157
9.8	9.6	9.3	9.0	0.15	0.15	0.225	0.225	0.75	2.00%	2.00%			2.50%	$ 487.92	$ 487.92	$ -	-	-	-
9.9	9.8	9.4	9.4	0.075	0.075	0.3	0	0.45	1.00%	1.00%		0.00%	1.50%	$ 487.92	$ 487.92	$ -	5	5	56
9.7	9.5	9.2	8.8	0.225	0.15	0.225	0.3	0.9		2.00%				$ 492.82	$ 493.56	$ 0.73	12	12	269
10.0	9.6	9.2	8.8	0	0.3	0.3	0.3	0.9	0.00%					$ 564.82	$ 571.34	$ 6.52	79	81	1,773
9.8	9.5	9.0	8.7	0.15	0.225	0.375	0.225	0.975	2.00%					$ 782.66	$ 802.84	$ 20.18	104	107	2,528
9.7	9.4	9.1	8.9	0.225	0.225	0.225	0.15	0.825				2.00%	2.75%	$ 487.92	$ 487.92	$ -	11	11	226
10.0	9.9	9.7	9.5	0	0.075	0.15	0.15	0.375	0.00%	1.00%	2.00%	2.00%	1.25%	$ 490.37	$ 490.65	$ 0.28	11	11	103
10.0	9.9	10.0	10.0	0	0.075	-0.075	0	0	0.00%	1.00%	-1.00%	0.00%	0.00%	$ 540.72	$ 540.72	$ -	37	37	-
9.7	9.2	8.8	8.4	0.225	0.375	0.3	0.3	1.2						$ 696.42	$ 711.61	$ 15.19	114	119	3,411
9.8	9.6	9.3	9.1	0.15	0.15	0.225	0.15	0.675	2.00%	2.00%		2.00%	2.25%	$ 517.32	$ 519.30	$ 1.98	47	48	791
9.9	9.6	9.3	9.0	0.075	0.225	0.225	0.225	0.75	1.00%				2.50%	$ 497.72	$ 498.46	$ 0.74	14	14	262
9.5	8.9	8.5	8.4	0.375	0.45	0.3	0.075	1.2				1.00%		$ 687.21	$ 702.69	$ 15.48	118	123	3,531
10.0	9.6	9.2	8.8	0	0.3	0.3	0.3	0.9	0.00%					$ 529.57	$ 532.00	$ 2.43	48	49	1,077
9.9	9.6	9.6	9.1	0.075	0.225	0	0.375	0.675	1.00%		0.00%			$ 487.92	$ 487.92	$ -	13	13	219
9.9	9.6	9.3	8.9	0.075	0.225	0.225	0.3	0.825	1.00%				2.75%	$ 850.75	$ 867.14	$ 16.39	165	170	3,394
9.6	9.1	8.8	8.4	0.3	0.375	0.225	0.3	1.2						$ 487.92	$ 488.70	$ 0.78	14	15	419
9.8	9.6	9.5	9.4	0.15	0.15	0.075	0.075	0.45	2.00%	2.00%	1.00%	1.00%	1.50%	$ 487.92	$ 487.92	$ -	1	1	11
9.8	9.6	9.2	8.8	0.15	0.15	0.3	0.3	0.9	2.00%	2.00%				$ 512.42	$ 514.92	$ 2.50	41	42	920
9.6	9.2	8.8	8.4	0.3	0.3	0.3	0.3	1.2						$ 487.92	$ 487.92	$ -	13	14	389
9.3	8.5	4.4	3.7	0.525	0.6	3.075	0.525	4.725						$ 1,019.70	$ 1,115.89	$ 96.19	174	201	20,499
10.0	10.0	10.0	10.0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%	$ 2,334.72	$ 2,334.72	$ -	376	376	-
									High	Avg. Error	4.02%	Avg. Error	2.88%	$ 34,969.86	$ 35,345.14	$ 375.28	2883.00	2,978.94	3.33%
															Rev. Lost %	1.07%		71,761.25	71,761.25
											Total Avg. Error:		2.88%						
											Total Meters Tested		57	Total Billed:		$ 34,969.86		Total Usage (Gal.):	2,156,484
											Projected Rev. Lost		$102,068.07	Total Lost Revenue:		$375.28		Total Lost Usage (Gal.):	71,761
												Std Dev:	2.16%	Total Lost Revenue %:		1.07%		Total Lost Water %:	3.33%
										50 of 57 (87.7%) are within one Std Dev									
0.0	-10.0	0.0	-10.0	7.5	7.5	7.5	7.5	30	100.00%	100.00%	100.00%	100.00%	100.00%	$ 487.92	$ 487.92	$ -	7	-	(5,236)
0.0	-10.0	0.0	-10.0	7.5	7.5	7.5	7.5	30	100.00%	100.00%	100.00%	100.00%	100.00%	$ 487.92	$ 487.92	$ -	1	2	748
9.9	9.8	9.6	9.4	0.075	0.075	0.15	0.15	0.45	1.00%	1.00%	2.00%	2.00%	1.50%	$ 487.92	$ 487.92	$ -	-	-	-

Exhibit 3. Capital Improvement Plan

AGENDA REPORT

Service, Quality, Community

DATE: July 22, 2014

TO: Board of Commissioners

FROM: Reginald A. Lamson, General Manager

PREPARED BY: Danielle McGee, Administrative Manager
Steve Wilson, Water Superintendent

RE: **Proposed Five-Year Capital Improvement Plan (FY 14/15-FY18/19) and Meter Replacement Implementation Program**

Background:

During the June Board meeting, staff was directed to provide additional information for the proposed 5-Year Capital Improvement Plan. Staff was also directed to revise the Meter Replacement Implementation Program staff report. Staff has combined the Proposed Five-Year Capital Improvement Plan and the Meter Replacement Implementation reports.

Since 1989, the main focus of DWP's Capital Improvements has been on supply facilities and pipeline replacement. DWP has replaced several well pumping units and constructed new wells to improve the quantity and quality of our pumping facilities. By the fall of 2014, the pumping facilities within the Big Bear Lake / Moonridge System, Sugarloaf / Erwin Lake System, Fawnskin System and Lake William System will meet the Department of Public Health's requirement that the pumping capacity of a water system shall be capable of meeting the Maximum Day Demand; when the highest producing pumping unit is not in service. This fall, the Klamath Booster Pumping Plant and the Angels Camp Reservoir will be operational, which will increase our operational flexibility and efficiency.

During the third year of the proposed Capital Improvement Plan, the Sawmill Well Pumping Plant will be constructed. This plant will be designed to pump 350 GPM to the new Angels Camp Reservoir. This additional capacity can serve the Sugarloaf / Erwin Lake System or be efficiently transferred to the Big Bear Lake / Moonridge System via the new Klamath Booster. During the second year of the proposed Capital Improvement Plan, DWP staff will rehabilitate The Bear Mountain Slant Wells and put these gravity supply facilities back into service. The proposed Capital Improvement Plan provides funding for annual replacement of existing pumping units and the construction of a new well pumping plant every four years. Staff will continue to recommend projects that enhance gravity supply facilities and improve operational efficiency.

The storage capacities in three of the four water systems meet the operational, fire and emergency storage requirements. Only the storage capacity in the Lake William System is below the current standard (0.16 MG vs. 0.23 MG). The proposed Capital Improvement Plan provides

funding for Reservoir Rehabilitation Projects. The recently constructed and proposed supply facilities adequately address DWP's supply needs over the next five years. Staff has reviewed the condition of our storage reservoirs and estimates that reservoir recoating and repiping can be deferred for three or four years.

DWP replaced 5.5 mile of pipelines during the summer of 2012. DWP staff replaced a half mile of pipeline in the Erwin Lake area over the last year and a half. DWP has also constructed 1.7 miles of new pipelines associated with the Arrastre Creek Well and Angels Camp Reservoir Projects. DWP has installed 7.7 miles of new pipeline since the summer of 2012.

DWP has 11 miles of undersized (4-inch diameter or smaller) steel pipelines and a half mile of 12-inch steel main within Big Bear Blvd. that was installed in 1947/1948. The 12-inch Big Bear Blvd. water main is the last section of this important water main that requires replacement. The proposed Capital Improvement Plan will schedule replacing this section of pipe during the fourth year of the plan. Within the proposed Capital Improvement Plan, DWP staff will replace a 1,000 LF of undersized steel pipeline and will focus on areas prone to freezing and on steel water mains located within back lot easement; relocating those mains to street rights-of way.

Ten years ago, DWP averaged 40 – 50 main leaks per year. Now, DWP averages about twenty main line leaks per year. Because DWP has recently installed 7.7 miles of new water mains and because water main leaks have dropped to twenty per year, staff is proposing to minimize pipeline replacement until FY 2021/22. Starting in FY 2021/22 and beyond, DWP will have nearly four million per year to dedicate towards capital improvement projects and we can replace the remaining steel and undersized water mains at an accelerated rate. If a large section of water main fails before FY 2021/22, DWP has a Capital Improvement Project Reserve to take care of emergency replacements.

DWP has 15,526 meters within its Big Bear Service Area. Some of the meters are over 70 years old. The typical warranty on a meter is 10 years on moving parts and 20 years on the meter body. DWP has completed random accuracy testing of the meters and found that 5 meters out of 60 tested passed the 98% accuracy standard. Two of the 60 meters tested were stuck. Revenue lost based on the inaccuracy of the 60 meters tested (not including the two stuck meters) is $137,000 per year, which is projected over the 15,503 active meters. Also during the meter testing program, staff calculated that there are potentially 540 meters stuck within our system. The potential revenue lost due to the stuck meters is estimated at $24,000 per year (see attached Meter Testing Program Staff Report). Because of the age and inaccuracy of DWP's meters, it would be prudent to implement a meter replacement program.

DWP has installed 1,525 Hersey radio read meters with Itron 200W radios between 2006 and 2010. These meters have generally performed well but there have been some issues related to the operation of these radios and meters. The primary concern with DWP's radio read meters is the batteries are not lasting ten years and the meters had questionable accuracy. Customer service from the vendor for the Hersey/Itron system has been inconsistent. Itron has developed a new 100W radio that has additional features and its batteries are supposed to last 20 years.

The current meter and radio that DWP is using are obsolete. DWP has conducted extensive testing on eleven different meters (five different manufacturers) and are considering either the Hersey 420 composite meter or the Sensus AccuStream composite meter. DWP has researched five different radio read systems and are considering either the Itron 100W system or the Sensus 520M MXU system. DWP staff estimates that they could complete a meter change out program

in six years. A manual read meter system would cost about $1.2 million and a radio read meter system would cost about $3.3 million.

Replacing the existing Meter System has the following advantages:

1) Additional usage revenue because the existing meters are under measuring.
2) All stuck meters would be replaced.
3) A reduction in DWP's unaccounted for water.
4) A favorable Internal Rate of Return on DWP's investment of 8.6% with a payback period of about 10 years.

Replacing the existing Meter System has the following disadvantages:

1) Cost of new meters.

The radio read system has the following advantages:

1) Two meter technicians could be reassigned to other water system maintenance duties.
2) Final/initial meter reads can be done from the office (1,280 reads/yr.).
3) Eliminates check reads related to human error and usual usage (850 reads/yr.).
4) Eliminates estimating water usage during winter months, which saves time in the billing and customer service departments.
5) Provides hourly water usage information, which reduces customer service time related to explaining a disputed bill.
6) Notifies the office of a possible leak, which reduces customer service and customer field service time associated with a flooded house. It reduces the amount of property damage to the home. It will also reduce the leak adjustments.
7) Eliminates check reads associated with leaks (460 reads/yr.).
8) Injuries that occur while reading meters will be eliminated.
9) Eliminates vehicle expense related to reading the meters.
10) DWP's conservation department will have real-time usage data to assist them in monitoring high water users.
11) Customers can check their current usage via our web page.
12) The radio read system can send the customer an email to notify them of unusual usage. The customer will setup this feature via our web page.
13) A favorable Internal Rate of Return on DWP's investment of 6.9% with a payback period of about 11 years.

Note: Savings related to items 4, 5, 6, 8, and 9, are difficult to quantify and were not calculated.

The radio read system has the following disadvantages:

1) The equipment is more expensive than manual read meters.
2) The batteries in the radio and in the meter register have a 20 year life. The radios and at least the meter registers will need to be replaced every 20 years.
3) Annual costs for equipment and software maintenance agreements.

Staff recommends implementing a Radio Read Meter Replacement Program. Staff also recommends installing the Sensus Radio Read System. Staff bases this recommendation on

Exhibit 3. continued (Minutes)

MINUTES OF A REGULAR BOARD MEETING
CITY OF BIG BEAR LAKE
DEPARTMENT OF WATER AND POWER
BOARD OF COMMISSIONERS
JULY 22, 2014

OPEN SESSION
A Regular Meeting of the Board of Commissioners of the City of Big Bear Lake, Department of Water and Power was called to order at 9:00 a.m. by Chair Foulkes at 41972 Garstin Drive, Big Bear Lake, California.

BOARD MEMBERS PRESENT:
Steve Foulkes, Chair
Bill Giamarino, Vice Chair
Bob Tarras, Treasurer
Don Smith, Commissioner
Craig Hjorth, Commissioner

BOARD MEMBERS EXCUSED:
None

PLEDGE OF ALLEGIANCE
Bill Giamarino, Vice Chair

PUBLIC FORUM
No public comment was received during the Public Forum.

1. **CONSENT CALENDAR**

1.1 Approve Minutes of a Regular Board Meeting Dated June 24, 2014

1.4 Resolution No. DWP 2014-09, Adopting Modifications to Water Service Administrative Fees

1.5 Ratification of Well Pumping Unit Change Order for Division #6

1.6 Budget Adjustment – Emergency Repairs at Pontell Booster Station

1.7 Adopt a CEQA Categorical Exemption for Selling the Rimforest Surplus Lots

Motion made by Treasurer Tarras, seconded by Commissioner Smith, and carried 5-0 to approve Consent Calendar items 1.1, 1.4, 1.5, 1.6 and 1.7 as presented.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

ITEMS REMOVED FROM THE CONSENT CALENDAR

1.2 Authorize Purchase of Pickup Truck
Board discussed the size of the pickup truck with Management.

Motion made by Commissioner Smith, seconded by Treasurer Tarras, and carried 5-0 to approve Consent Calendar item 1.2 as presented.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

1.3 Resolution No. DWP 2014-08, Amending Policy #2011-01, Benefits and Working Conditions for Unrepresented Employees
Board discussed the proposed policy amendments with Management. Board directed staff to modify the health insurance section to specify employee premium pick-up scenario, and bring back for the Board's consideration. Board directed staff to review certification payment benefit at the end of 2016. Board requested staff check with legal counsel regarding discussed changes to retirement benefits.

2. DISCUSSION/ACTION ITEMS

2.1 Check Register 06/01/14 – 06/30/14
Board reviewed and discussed the check register for June 2014 with Management.

Motion made by Vice-Chair Giamarino, seconded by Treasurer Tarras, and carried 5-0 to authenticate the Check Register for June 2014 as presented.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.2 Revision to Leak Adjustment Credits
Board discussed the modification of leak adjustment factors with Administrative Manager McGee.

Motion made by Commissioner Smith, seconded by Commissioner Hjorth, and carried 5-0 to modify the leak adjustment factors to $0.72/CCF for the marginal cost of water, and $115 per incident for the service fee.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.3 DWP Office Building Solar Project
Board discussed the proposed solar project with General Manager Lamson.

Motion made by Treasurer Tarras, seconded by Vice-Chair Giamarino, and carried 5-0 to authorize staff to proceed with the proposed office-building solar project for a not to exceed amount of $350,000.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.4 Authorize Purchase of Backhoe
Board discussed the proposed backhoe purchase with Management.

Motion made by Vice-Chair Giamarino, seconded by Commissioner Smith, and carried 5-0 to authorize the purchase of a Backhoe from RDO Equipment Co. in the amount of $88,489, after trade-in of 1990 Case Backhoe.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.5 Tentative Five-Year Capital Improvement Plan (FY 14/15 – FY 18/19) and Meter Replacement Implementation Program
Board discussed the proposed five-year Capital Improvement Plan (CIP) with Management. General Manager Lamson provided the Board with a summary of the proposed CIP, including a detailed explanation of the proposed Meter Replacement Program.

Motion made by Vice-Chair Giamarino, seconded by Commissioner Smith, and carried 5-0 to approve the proposed five-year Capital Improvement Plan, including the Meter Replacement Program; and associated budget adjustment as presented.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.6 Resolution No. DWP 2014-10, Requesting that the City Council Consider Annexation of Parcels Outside the City Limits
Board discussed the resolution with Management.

Motion made by Commissioner Smith, seconded by Vice-Chair Giamarino, and carried 5-0 to approve Resolution No. DWP 2014-10, Requesting that the City Council Consider an Application to Annex Parcels Outside the City Limits Owned by the City of Big Bear Lake, DWP.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.7 New Pension Accounting Requirements
Board discussed the new pension accounting requirements with Administrative Manager McGee.

Motion made by Vice-Chair Giamarino, seconded by Commissioner Hjorth, and carried 5-0 to adopt the initial measurement date for compliance with GASB 68 as June 30, 2014.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.8 Award Installation of Telemetry Equipment at Arrastre Creek Well and Klamath Booster Station
Board discussed the installation of telemetry equipment with General Manager Lamson.

Motion made by Treasurer Tarras, seconded by Commissioner Smith, and carried 5-0 to award the proposed telemetry contract to Byrd Industrial Electronics in the amount of $33,821.87; and budget internally for a 10 percent contingency for a total amount of $37,200; and approve associated budget adjustment as presented.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.9 Award Emergency Repair at Lassen #4 Well
Board discussed the emergency repairs at Lassen #4 Well with Management.

Motion made by Vice-Chair Giamarino, seconded by Commissioner Smith, and carried 5-0 to approve the proposed emergency repairs at Lassen #4 Well; and award the contract to Romans Construction Co. in the amount of $14,800; and budget internally for a 10 percent contingency for a total amount of $16,280; and approve associated budget adjustment as presented.

AYES: Foulkes, Giamarino, Tarras, Smith, Hjorth

2.10 Management Reports
Board discussed Management Reports. Board directed staff to issue a public release regarding the State's Water Conservation Regulation that goes into effect August 1, 2014. Board directed staff to develop and propose a new water conservation incentive plan for the Board's consideration. Board requested staff discontinue reporting Rimforest production levels.

2.11 Board Member Reports
Commissioner Smith discussed a terrorist awareness training class he attended and recommends for DWP staff. Chair Foulkes informed the Board that he is running for the Bear Valley Unified School District Board. If elected, Chair Foulkes intends to resign from the DWP Board after the December 2014 meeting.

At 11.35 a.m. Chair Foulkes moved to recess without objection.

At 11:41 a.m. Chair Foulkes reconvened the meeting.

3. CLOSED SESSION

At 11:41 a.m. the Board went into closed session.

3.1 Closed Session Pursuant to Section 54956.95
Liability Claim
Claimant: Dominique Kreger
Agency Claimed Against: City of Big Bear Lake, Department of Water and Power

3.2 Closed Session Pursuant to Section 54956.95
Liability Claim
Claimant: David Delbridge
Agency Claimed Against: City of Big Bear Lake, Department of Water and Power

OPEN SESSION

At 12:09 p.m. the Board came out of closed session. No reportable action was taken.

ADJOURNMENT

No additional business came before the Board. At 12:09 p.m. Chair Foulkes adjourned the meeting.

Diego Chavez, Secretary
DWP Board of Commissioners

Approved at meeting dated:

Exhibit 4. Water Meter Specifications

Aqua Metric

Aqua Metric Sales Co. 4050 Flat Rock Dr. Riverside CA 92505, (951)- 637-1400 (951) 637-1500 j

Sensus Limited Warranty

G-500 R19

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: https://sensus.com/TC/TermsConditions.pdf.

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 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:

	New Meter Accuracy	Repair 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:

	Repair 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" 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" 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:

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

V. PMM® 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" PMM 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:

	Repair Meter Accuracy
5/8" PMM	1,500,000 gallons
3/4" PMM	2,000,000 gallons
1" PMM	3,000,000 gallons

VI. PMM 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" PMM 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:

	Repair Meter Accuracy
1-1/2" PMM	5,000,000 gallons
2" PMM	8,000,000 gallons

VII. iPERL™ Water Management Systems...
that register water flow are warranted to perform to the accuracy levels set forth in the iPERL Water Management System Data Sheet (IPL-110), available at www.sensus.com/iperl 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 PMM 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, PMM, accuSTREAM Standard Registers	25 years
5/8" thru 2" SR, SR II, PMM, accuSTREAM Encoder Registers	10 years
Electronic Communication Index (ECI)	10 years
All 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 TouchPads	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*
Hand Held Device	1 year
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
ICon A and FlexNet Electricity SmartPoint Module	1 year
IPERL System Battery and IPERL System Components	20 years*
Residential Electronic Register	20 years*

(continued)

sensus

Sensus Limited Warranty

*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
- IPERL System Batteries, and/or the IPERL System flowtube, 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) 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 (ii) 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 MXU'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 SOFT¬WARE 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 AND WARRANTIES, 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

SENSUS

Exhibit 5. Letters of Recommendation

PAUL COOK
8TH DISTRICT, CALIFORNIA

1222 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-5861

Congress of the United States
House of Representatives
Washington, DC 20515–0508

January 13, 2016

The Honorable Estevan López
Commissioner, Bureau of Reclamation
1849 C Street NW
Washington DC 20240-0001

RE: Support Letter for Big Bear Lake Department of Water and Power AMI Project

Dear Mr. López:

It is my pleasure to write this letter in support of the City of Big Bear Lake Department of Water (BBLDWP) Advanced Metering Infrastructure (AMI Project). WaterSMART 2016 grant funding for the AMI Project will allow BBLDWP to convert 2,500 meters per year from old, outdated, and often inaccurate meters to "smart" meters. This project will provide real time radio reads of water consumption to the BBLDWP staff, allowing them to reduce water waste through active monitoring and leak detection along with enforcement of water regulations and customer engagement. The reduced need for manual meter will result in less carbon emissions from vehicle use, improved accuracy, increased customer engagement, and more conservation.

The BBLDWP serves a California mountain community of approximately 15,500 connections and is somewhat unique in its need for AMI. Extreme weather conditions can create water loss issues because winter snows often require that meter reads be estimated, which allows leaks to go undetected for months. Additionally, freezing temperatures result in damaged pipes, thereby wasting water and causing property damage. Complicating matter is the fact that nearly 70 percent of BBLDWP customers are second homeowners who don't live in their homes year-round. This makes leak detection and timely repair exceedingly difficult. AMI will allow the BBLDWP to address all of these issues in a more efficient and effective manner.

It is important to underscore the fact that this proposed project is in alignment with the Santa Ana Watershed Project Authority's One Water One Watershed sustainability initiative identified in the Bureau of Reclamation's Basin Study.

I am in full support of the efforts of BBLDWP as they seek external funding to support a program designed to provide a robust dataset for water management that will result in water and energy conservation. If you would like to discuss this matter further, please contact my Apple Valley office at (760) 247-1815.

Sincerely,

Col. Paul Cook (Ret.)
Congressman, 8th District of California

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STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0033
(916) 319-2033
FAX (916) 319-2133

DISTRICT OFFICE
15900 SMOKE TREE STREET, SUITE 125
HESPERIA, CA 92345
(760) 244-5277
FAX (760) 244-5447

Assembly
California Legislature

JAY OBERNOLTE
ASSEMBLYMAN, THIRTY-THIRD DISTRICT

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JOINT COMMITTEES
JOINT COMMITTEE ON ARTS
JOINT LEGISLATIVE BUDGET

Estevan López
Commissioner
Bureau of Reclamation
1849 C Street NW
Washington DC 20240-0001

RE: WaterSmart 2016: City of Big Bear Lake Advanced Metering Infrastructure Project

Dear Mr. López,

I am writing to express my support for the City of Big Bear Lake, Department of Water (BBLDWP) Advanced Metering Infrastructure (AMI) Project. The AMI project will allow the BBLDWP to convert 2,500 meters per year from old, outdated, and sometimes inaccurate, meters to "smart" meters. This project will provide real time radio reads of water consumption to the BBLDWP staff, allowing them to reduce water waste through active monitoring and leak detection along with enforcement of water regulations and customer engagement. The reduced need for manual meter reading means less driving, less emissions, increased accuracy, increased customer engagement, more information and more conservation.

The BBLDWP serves a mountain community of about 15,500 connections and is somewhat unique in its need for AMI. First, extreme weather creates two water loss issues; heavy winter snows mean meter reads must sometimes be estimated, which means leaks can go undetected for months and freezing temperatures result in leaky pipes, wasting water and causing property damage. Second, nearly 70% of BBLDWP customers are second homeowners which can make leak detection and timely repair exceedingly difficult. In addition, some affluent homeowners have an expectation of landscaping that may not be suitable for arid and high elevation properties and requires irrigation that is inconsistent with BBLDWP water conservation regulations. Lastly, the BBLDWP has no imported water so conservation is a constant. AMI will help the BBLDWP address all of these issues.

Last but not least this project is in alignment with the Santa Ana Watershed Project Authority's One Water One Watershed (OWOW) sustainability initiative identified in the Bureau of Reclamation's Basin Study. In conclusion, I fully support the efforts of the BBLDWP as they seek external funding to support a program designed to provide a robust dataset for water management that will result in water and energy conservation.

Sincerely,

Assemblyman Jay Obernolte
33rd Assembly District
State Capitol Office: Room 4116
Sacramento, CA 94249

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Big Bear City Community Services District

P.O. BOX 558 • 139 EAST BIG BEAR BLVD • BIG BEAR CITY • CALIFORNIA • 92314
PHONE (909) 585-2565 • FAX (909) 585-0025 • WWW.BBCCSD.ORG

January 19, 2016

Estevan López
Commissioner
Bureau of Reclamation
1849 C Street NW
Washington DC 20240-0001

RE: WaterSmart 2016: City of Big Bear Lake Advanced Metering Infrastructure Project

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Sincerely,

Scott Heule
General Manager

ATTACHMENTS FORM

Instructions: On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

Important: Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

1) Please attach Attachment 1	BBLDWP_AMI_WaterSMART_GroupI	Add Attachment	Delete Attachment	View Attachment
2) Please attach Attachment 2		Add Attachment	Delete Attachment	View Attachment
3) Please attach Attachment 3		Add Attachment	Delete Attachment	View Attachment
4) Please attach Attachment 4		Add Attachment	Delete Attachment	View Attachment
5) Please attach Attachment 5		Add Attachment	Delete Attachment	View Attachment
6) Please attach Attachment 6		Add Attachment	Delete Attachment	View Attachment
7) Please attach Attachment 7		Add Attachment	Delete Attachment	View Attachment
8) Please attach Attachment 8		Add Attachment	Delete Attachment	View Attachment
9) Please attach Attachment 9		Add Attachment	Delete Attachment	View Attachment
10) Please attach Attachment 10		Add Attachment	Delete Attachment	View Attachment
11) Please attach Attachment 11		Add Attachment	Delete Attachment	View Attachment
12) Please attach Attachment 12		Add Attachment	Delete Attachment	View Attachment
13) Please attach Attachment 13		Add Attachment	Delete Attachment	View Attachment
14) Please attach Attachment 14		Add Attachment	Delete Attachment	View Attachment
15) Please attach Attachment 15		Add Attachment	Delete Attachment	View Attachment