

# Davis & Weber Counties Canal Company Secondary Water Metering Project

WaterSMART: Water & Energy Efficiency Grants for FY 2015

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# Table of Contents

I.	<b>Executive Summary</b> .....	3
	Applicant Info	
	Project Summary	
	Schedule	
II.	<b>Background Data</b> .....	4
	Geographic Location/Map	
	Water Supply	
	This project will increase conservation methods, educate the Secondary Users about their overuse, and help make users more accountable. DWCCC considers this project to be a very high priority project within their Conservation Plan.	
	Water Delivery System	
	Energy Efficiency	
	Relationship with Reclamation	
III.	<b>Technical Project Description</b> .....	11
IV.	<b>Evaluation Criteria</b> .....	13
	Evaluation Criteria A: Water Conservation	
	Evaluation Criteria B: Energy-Water Nexus	
	Evaluation Criterion C: Benefits to Endangered Species	
	Evaluation Criterion D: Water Marketing	
	Evaluation Criterion E: Other Contributions to Water Supply Sustainability	
	Evaluation Criterion F: Implementation and Results	
	Evaluation Criterion G: Additional Non-Federal Funding	

Evaluation Criterion H: Connection to  
Reclamation Project Activities

V.	<b>Environmental and Cultural Resources Compliance .....</b>	<b>31</b>
VI.	<b>Required Permits or Approvals .....</b>	<b>33</b>
VII.	<b>Letters of Project Support.....</b>	<b>34</b>
VIII.	<b>Official Resolution .....</b>	<b>35</b>
IX.	<b>Project Budget .....</b>	<b>36</b>
	Funding Plan and Letters of Commitment	
	Budget Proposal	
	Budget Narrative	

**Attachments**

**A Project Location and Meter Replacement Boundary Map**

**B Planning Documents**

**C Product Technical Support**

# Executive Summary

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## **Applicant Info**

*Date, Applicant Name, City, County and State*

**Date:** January 8, 2015

**Applicant name:** Davis and Weber Counties Canal Company (DWCCC)

**City, County, State:** Sunset, Davis, Utah

### **Project Manager:**

- Name: Bryce Wilcox, P.E. DWCCC Engineer
- Title: Project Manger
- Telephone: 801-547-0393
- E-mail: bkw@jub.com

**Project Funding Request:** \$300,000.00 total project costs \$750,200

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## **Project Summary**

*A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of this FOA*

The project being proposed is the Davis and Weber Counties Canal Company (DWCCC) Secondary Water Metering Project. The project will install 700 meters for the secondary water end users for a small portion of the DWCCC service area. Along with this, a 20kW Small hydropower generation reversible pump turbine will be located at the end of the secondary water system's lowest elevation reservoir main diversion which will the Company to generate 27,000 kilowatt hours (kWh) of power per year. The DWCCC project is a positive step toward achieving the goals of the WaterSMART program by implementing methods and materials that have proven successful for water conservation and energy sustainability. The proposed project, when completed will have a measurable water savings of 152 acre-feet and educational opportunities to help change the way secondary water is used and allocated. The project will allow DWCCC and its water providers a way in which to place accountability on end users for the volume of water currently being used. DWCCC selected the highest customer use areas within Clinton City and West Point City for this project.

The project is being requested under Task A Water Conservation Municipal Metering and Task B – Energy-Water Nexus for Implementing Renewable Energy Projects Related to Water Management and Delivery. This project has been identified within DWCCC's System Optimization Review (SOR) which was approved in 2013.

Project located

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## **Schedule**

*State the length of time and estimated completion date for the project*

This project is ready to move forward as soon as it is awarded. An environmental document will be prepared as part of the project and it is felt that a Categorical Exclusion will be approved based on the fact that the project will take place in previously disturbed areas and within existing road alignments.

The permits for the small hydro power will be filed under a “Conduit Exemption” for small hydro and the power sales agreement will need to be negotiated with Rocky Mountain Power.

The project will require a minimal amount of design and is ready to go as soon as the contracts are signed. The environmental document will take one to three months with design taking place at the same time. The installation of the meters will take 12 to 13 months and will take place through the spring, summer, and fall months (March 2016 – October 2016 and then again March 2017 – June 2017). The Hydro will be installed March of 2016. The project will be accomplished within the two year allowance.

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## **Background Data**

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### **Geographic Location/Map**

The service area of DWCCC includes communities located in Weber, Davis, Summit, and Morgan Counties, including the cities of West Point, Clinton, Sunset, Layton, South Weber, Kaysville, Roy, Clearfield, West Haven, Riverdale, and Syracuse with a total population of over 370,000 residents. They also provide water to the Snyderville Basin Area, South Weber, Roy, Clinton, West Point, Syracuse, Layton, and Kaysville for irrigation and secondary water use. The meters will be placed on the highest end users within Clinton City and West Point City. Attachment A, Project Location and Meter Replacement Boundary Map.

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### **Water Supply**

*Describe the source of water supply, the water rights involved, current water uses (i.e., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in water*

supply. If water is primarily used for irrigation, describe major crops and total acres served.

- » **Source of water supply:** The source of water is from the direct flow rights of the Weber River, which is supplied from reservoir storage in Echo and East Canyon Reservoirs. Water is delivered through a series of canals, ditches, and low- and high-pressure pipelines from the main canal.
  
- » **Water rights involved:** Direct flow water rights claimed, using the Weber River based upon the flow of the river for direct use:
  - Direct flow water rights claimed, using the Weber River based upon the flow of the river for direct use:
  - Flood 433 cfs,
  - High Water 216 cfs
  - Low Water 133 cfs
  - Storage rights of 57,553 acre-feet (28,000 from East Canyon Reservoir and 29,553 from Echo Reservoir)
  - The 6-year average annual water rights available is 70,240 acre feet. The average annual use delivered through the canal system is 55,036 acre-feet. The remaining portion (15,204 acre-feet) is directly diverted from the Weber River by other shareholders.
  
- » **Current water uses and number of water users served:** The majority of the water use (based on volume) is agricultural with over 40,790 acres irrigated. Secondary water uses for lawns and garden, parks, churches, and schools consists of over 31,439 connections within the DWCCC service area including water supplied to the sub-districts of Roy, South Weber, Syracuse, and Weber Basin Water Conservancy District. There are 14,375 connections in the secondary water system operated by DWCCC. In 2014, there were 15,040 acre-feet of water dedicated to the secondary water system.
  
- » **Current and projected water demand:** This project is for the Secondary Water System for DWCCC and will address only the current and projected demands for that portion of the system. Through extensive planning and evaluation, a list of potential water demands includes the following:
  - Water to serve an additional 10,000 secondary water connections within the next ten years as growth and land conversions continue throughout the DWCCC service area. This will account for an additional 6,500 acre-feet of water needed for the secondary systems.
  
  - Additional water to meet municipal and industrial (M&I) demands as communities and commercial areas continue to evolve and grow. Information

from the 2010 census indicates that the DWCCC service area, which includes areas within Weber and Davis Counties, doubled in population in 10 years instead of 20 years as earlier projected. The Company also supplies water to areas within Morgan and Summit Counties. They have also experienced significant and intense growth according to the 2010 census. This population change has prompted DWCCC to plan and prepare for greater secondary water needs beyond what had been originally anticipated.

- Water to service the fast growing Summit County area with Secondary Water. The Summit Water Distribution District has 303 shares of DWCCC water and Weber Basin Water Conservancy District is currently leasing 5,000 acre-feet of water for the Park City/Snyderville Basin areas for secondary water use. Their thirst for water is growing at staggering rates and will be a significant impact for demands upon available existing DWCCC water supplies.
- » **Potential shortfalls in water supply:** DWCCC faces potential shortfalls in four main areas:

1. Losses in the delivery system – The principal potential shortfall for the Canal Company is water losses within the delivery system. These losses impact deliver to the secondary water users as well as to the agricultural users and impact water delivery in drought years which has caused considerable shortages to all users. The past two years (2012-14) have been considered to be drought years and 2015 is not looking any better. **The Company is making major strides to correct this problem and has had several projects that they have completed or that will be completed within the next few years thanks to funding assistance from Reclamation.**

This project will increase conservation methods, educate the Secondary Users about their overuse, and help make users more accountable. DWCCC considers this project to be a very high priority project within their Conservation Plan.



**Echo Reservoir during Drought Year**

2. Drought - DWCCC potential shortfalls from drought can and have had an impact on the current water supply. The State of Utah does not have a

detailed drought management plan, but has made strides since the severe drought of the late 1990's and early 2000 years. However, extreme concerns exist in the DWCCC service area which caused them to redefine their drought mitigation plans and implementations on an annual basis. In 2012, 2013, and 2014, the snowpack was minimal at best which supplies reservoir storage. The Canal Company was forced to start using their storage water much earlier than normal. The irrigation season was cut short by 14 days in 2013 and 2014 and in 2012 the Company received only 40 days of natural flow from the Weber River for the season. This required the company to



**Echo Reservoir during a drought year**

request all users to limit their water usage very early in the season and throughout the year.

The droughts have severely impacted the amount of storage carryover water available at the end of the irrigation season. It looks like the area could be in a drought situation again this year (2015). If the natural flow rights are not available, the Company may not be able to provide enough water to all its users. The transmission losses on the

lower main canal will complicate the already severe water shortages. Extreme over use by secondary water users tend to increase these shortages.

3. Growth - Within the past 10 years, DWCCC's service area has seen a significant population increases with many new residential housing developments, businesses, schools, and churches; all of which are serviced by DWCCC's secondary irrigation water.

Davis and Weber Counties are listed as two of the fastest growing counties in Utah. Both of these counties are served by DWCCC water. In 1995, agricultural water usage was 80% of the total water used, whereas today the use is approximately 55% according to the Governor of Utah's Water Task Force Committee. This 25% difference is water that has been converted from agriculture crop production to outdoor agriculture uses for lawns gardens, parks, schools, churches, and municipal and commercial needs. As the population increases in the service area, the need for more culinary and secondary water also increases. Metering the Secondary Users is key to being able to provide water to new customers in the DWCCC service areas and



protect the availability of water for existing users as well as for new users in the future.

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## **Water Delivery System**

Describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (i.e., type, miles, and acres). For municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.

### ***Reservoirs***

- East Canyon Reservoir storage 48,000 acre-feet capacity (DWCCC owns 28,000 acre-feet of this capacity)
- Echo Reservoir storage 74,000 acre-feet capacity (DWCCC owns 40% of this capacity)

### ***Canal System***

The headworks river control gates and overflow gates divert water from the Weber River into the DWCCC canal.

- Forebay channel includes trash racks, a canal gate, which controls the flow into the main canal, and an overflow crest gate structure that diverts excess water back into the Weber River.
- The DWCCC canal system consists of 17.22 miles of main canal which is defined as the upper main canal and the lower main canal:
  - » Open Channel – 12.3 miles of trapezoidal concrete-lined channel some parts of the canal are earthen only
  - » Enclosed – 4.9 miles of pipe or box culvert
  - » 90 diversion gates and syphons servicing 100 different ditch companies



**Section of open canal in the delivery system**

### ***Pressurized Secondary System***

- Approximately 36 miles of pressurized secondary water transmission trunk lines
- Sunset Secondary Water Reservoir with 34 acre-feet capacity
- Church Street Secondary Water Reservoir with 43 acre-feet water storage capacity

- Kaysville East Secondary Water Reservoir with 24 acre-feet water storage capacity
- 200 South West Point Secondary Water Reservoir with 12 acre-feet water storage capacity
- Roy Water Conservancy Sub-District with a 125 acre-foot water storage capacity
- 112.4 miles of secondary water distribution piping in the West Point/Clinton System
- 64.8 miles of pressurized secondary water distribution piping in the Kaysville/Layton System
- 3.2 miles of pressurized secondary water distribution piping in South Weber System
- Syracuse Sub-District with three water storage reservoirs that total 106 acre-feet of water storage capacity

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### **Energy Efficiency**

*If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.*

This project will have renewable energy components built into of the project by installing one 20kWh small hydropower generation reversible pump turbine.

Currently, within another project DWCCC is implementing another type of renewable hydro power energy generation component in its system. With the development of this new project additional hydro power generation will give DWCCC a greater renewably energy opportunity within their system which will allow them to reduce their reliance on outside energy sources and permit the company to run many of their own facilities with this power that has been generated.

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### **Relationship with Reclamation**

*Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the projects(s).*

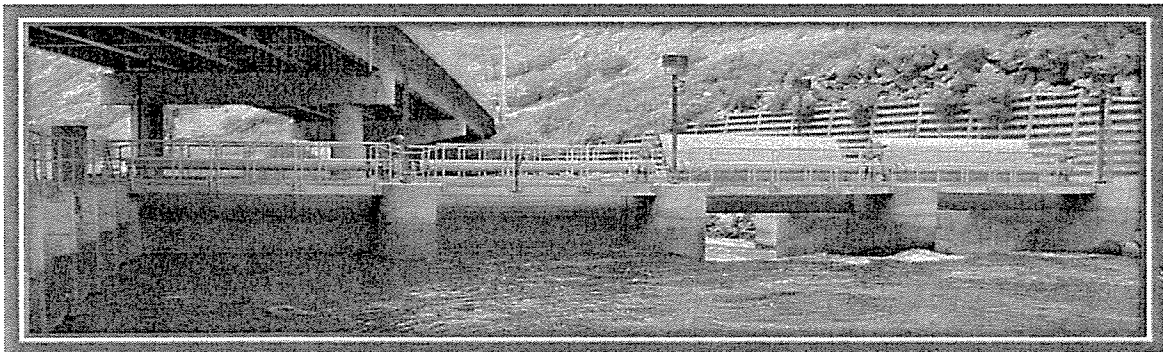
DWCCC has had a number of projects in conjunction with Reclamation over the past years, starting in the 1930s with the construction of Echo Dam and in 1964 expansion of the of the East Canyon Dam. Reclamation facilities exist in the same Weber River Basin as this proposed project. Some DWCCC stock is owned by Weber Basin Water Conservancy District (WBWCD) a reclamation project. Some of their water is delivered through the DWCCC facilities, approximately 15,204 acre-feet.

In 2014, DWCC received a WaterSMART Energy Efficiency Grant for \$1 million towards a \$3.05 million dollar project. The project includes metering five turnouts, placing over 4300 feet of large diameter RCP pipe in the main canal and the installation of two 10 kW small hydro power generation turbines at key locations to generate 86,400 kilowatt hours (kWh ) of power per year. This project will be constructed in 2015 – 2017.

In 2011, DWCCC received a WaterSMART System Optimization Review (SOR) grant. This Plan was completed earlier this year and has identified the project priorities in their water system. This canal project has been designated as a top priority in the newly completed SOR Plan and will assist in accomplishing the goals of the Plan.

In 2009, DWCCC received a \$3.6 million matching “Challenge Grant” to replace the forebay channel, river diversion structure and gates, and install 1,300 feet of box culvert located in Weber Canyon. The SCADA system was also upgraded to allow for remote operation of the new facilities. That project included 3,250 feet of two 66” diameter RCP pipes, 500 feet of triple barrel 66” diameter RCP pipes, and 1,650 feet of new open canal trapezoidal concrete liner with water stop to replace existing deteriorated concrete liner sections and areas with no liner at all. Many entities including Federal, State, County and City Governments, private property owners, water districts and shareholders have participated in and worked toward the success of DWCCC’s infrastructure rehabilitation projects.

In 2005 The Company received a Water 2025 challenge grant for a water measurement and automation project. This measurement and automation project is highly successful in that it has identified areas of water savings, provided for more accurate measurements and better monitoring, established faster reaction times for emergency responses and implemented automation through-out the Canal Company’s system.



**New Headwork’s Structure Funded with Challenge Grant Funds**

## Technical Project Description

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*Describe the work in detail, including specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.*

Secondary irrigation water usage in the DWCCC operated systems accounts for approximately 22% of Davis and Weber Counties Canal Company's total water usage. Within the DWCCC's secondary water service area over 15,040 acre-feet of water is used for secondary irrigation.

The area of most promise for water savings comes in educating secondary water users on how much water they really use. Davis and Weber Counties Canal Company has worked closely with Weber Basin Water Conservation District (WBWCD) to understand how their secondary water metering project has worked and the water conservation they have seen over the past two years since they implemented their metering projects. Within WBWCD's "Secondary Metering How-to-Guide" and their "Supply & Demand Study" they found that on average, water usage on metered irrigation connection's was reduced by 22% when compared to unmetered usage. Many of their customers have similar acreages and lot sizes that are similar to DWCCC's secondary water customers.



**Over use of secondary water on pastures**

DWCCC has found through house water audits that a large number of users in Clinton and West Point City have been using water well above the average for the unmetered secondary water usage rate. For this reason DWCCC has chosen this area as an ideal location to begin the metering. This type of project has been identified in the SOR to generate substantial conservation which will be sustainable year after year.

Current retail irrigation water is allocated at 3 acre-feet per acre and users are charged based on the allocated water, and not on the amount or water used. It is

not fully known to what extent the end users stay within their water allocations. It is assumed from the house water audits and the usage rates that many customers are exceeding their allocations which is impossible to account for this water without meters. It has been proven that the most effective way to reduce water usage is to have water use accountability and provide education and financial incentives to conserve water. This goal for water accountability is not possible until irrigation connections are metered.

As of May 2013, DWCCC started requiring all new subdivisions to provide secondary water meters for each of their developed lots. In the past irrigation connections were not metered because metering technology could not function reliably with the quality of irrigation water. Recently, a new metering technology that has been used by some water providers make use of a tried and tested fluidic oscillation technology. DWCCC will be using this new metering technology in this project. In consultation with WBWCD they have found after testing a number of meters, which one has worked best for them. It is the Sensus IPERL. DWCCC has the same types of climates, water quality, and usage times as WBWCD therefore DWCCC will be using the same type of meter for their Secondary Water Metering Project.



**Over Use of Secondary Water on Pasture**

The metering project will provide essential information that will be used throughout the Company's service area and is the starting point for a number of additional metering and water conservation programs. This project will be used to help educate and promote water use accountability throughout the DWCCC service area. It will also help determine the most effective areas to focus upon for future metering and conservation efforts that will produce the most significant reductions in secondary irrigation water usage.

# Evaluation Criteria

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## **Evaluation Criteria A: Water Conservation**

### **Subcriterion A.1: Quantifiable Water Savings**

**Describe the amount of water saved.** For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.

- Average annual acre-feet of water supply:

The average annual acre-feet of water supply for DWCCC is approximately 70,240 acre-feet (six-year measured average). 15,040 acre-feet is used for DWCCC secondary water. The West Point and Clinton Cities combined use 9,200 acre-feet of this water. This project is estimated to conserve 152 acre-feet of DWCCC's water supply. When all of the connections are metered it is anticipated to save 3,300 acre-feet.

- Where is the water currently going ((e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?)

Water is being overused on lawns, gardens, concrete sidewalks, and pastures. In some cases, the secondary system has been used to irrigate row crops, alfalfa, and pastures that have a flood irrigation right associated with them.

- Where will the conserved water go?

The conserved water will stay in Echo and East Canyon reservoirs. The conserved water will provide a more secure water right for the next irrigation season, be more available as a buffer during times of drought, be available for new secondary use as agriculture lands convert to residential lawns and gardens, be made available for new customers and benefit the fish and wildlife habitats on the Weber River through additional prolonged flows of available water.

#### (2) Municipal Metering:

Municipal metering projects can provide water savings when individual user meters are installed where none exist to allow for unit pricing and when new meters are installed within a distribution system to assist with leakage reduction. Applicants proposing municipal metering projects should address the following:

- (a) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

Weber Basin Water Conservancy District (WBWCD) has been installing secondary water system meters over the past few years. WBWCD

published a "Secondary Metering How-to-Guide" with their findings. WBWCD showed that with metered connections, the water use was approximately 22% less than the allocated amount. We used this 22% water savings as the basis for our water savings calculations.

The Clinton and West Point system was allocated 9,200 acre-feet of water in 2014. There are also 9,340 of existing connections.

This gives a rate per connection of  $9,200 \text{ acre-feet} / 9,340 \text{ connections} = 0.99 \text{ acre-feet per connection}$ .

For 700 meters, the amount allocated would be  $700 \times 0.99 \text{ acre-feet per connection} = 693 \text{ acre-feet}$ .

At a 22% savings, the overall water savings is  $22\% \times 693 \text{ acre-feet} = 152 \text{ acre-feet}$ .

Once all the connections are metered the savings would be  $22\% \times 15040 \text{ acre-feet} = 3,300 \text{ acre-feet}$ .

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

The losses have been based on WBWCD experience after installing secondary water system meters over the past few years. WBWCD published a "Secondary Metering How-to-Guide" with their findings.

- (c) *For individual water user meters installation, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.*

WBWCD secondary water projects are in the same region and within 15 miles of the proposed project. The 22% water losses have been based on WBWCD experience. WBWCD published a "Secondary Metering How-to-Guide" with their findings that was used as a guide for the water loss calculations.

- (d) *If installing distribution main meters will result in conserved water, please provide support for this determination (including, but not limited to leakage studies, previous leakage reduction projects, etc.). Please provide details underlying any assumptions being made in support of water savings estimates*

(e.g., how leakage will be reduced once identified with improved meter data).

Mainline meters exist in the system. No new mainline meters will be installed.

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

700 Sensus 1" IPERL Meters will be installed in the system. This meter is one of the meter types that WBWCD uses and has a proven track record for accuracy on secondary irrigation systems in this area.

- (f) How will actual water savings be verified upon completion of the project?

There is an existing mainline meter at the start of the pressure irrigation system that has produced reliable data on for the last 6 years. The meter is connected to the DWCCC scada system and is continuously recording flows on the system. The flows in the system after the meters are installed will be recorded. These flows will be compared to the historical flows on a monthly basis to determine the water savings through metering.

#### **Subcriterion A.2: Percentage of Total Supply**

**Provide the percentage of total water supply conserved:** State the applicant's total average annual water supply in acre-feet. Please use the following formula:

The Company provides agriculture and secondary water irrigation through the main canal to various users i.e. shareholders with agricultural use, cities and sub-districts with secondary water uses and ditch companies with agricultural uses as well as conservation districts. The total system deliveries for the secondary irrigation systems are approximately 15,040 acre-feet/year. The proposed project area has an annual contracted delivery from the Company of approximately 9,200 acre-feet/year. It is anticipated that 152 acre feet/year savings will be achieved by installing meters. The metering, coupled with education and/or possibly implementing various rate structures or other financial incentives will help motivate end users to cut back on what is now considered over usage.

*Estimated Amount of Water Better Managed*  
*Average Annual Water Supply*

152 acre-feet  
15,040 acre-feet delivered for the secondary system = 1.0%



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## **Evaluation Criteria B: Energy-Water Nexus**

### **Subcriterion B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery**

**Describe the amount of energy capacity.** For projects that implement renewable energy systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.

The proposed project would install a reverse pump hydro power turbine at an existing pump station. The West Point pump station is at the end of the DWCCC secondary system and can be filled through the secondary system during off-peak hours. A 20 kW reverse pump turbine can easily be added to the inlet into the pond to generate power. The potential power is determined by the following calculation.

$$(277 \text{ feet of head} \times 1 \text{ cfs} \times 80\% \text{ efficiency} \times 62.4) / 737 = 18.76 \text{ kW or } 20 \text{ kW motor}$$

**Describe the amount of energy generated.** For projects that implement renewable energy systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.

The inlet to the pond delivers water during off peak times of day from 10:00 am to 6:00 pm. Power could be generated for 8 hours a day from April 15<sup>th</sup> to October 15<sup>th</sup>. The total power generated for the year would be 27,000 kWh per year.

$$18.67 \text{ kW} \times 180 \text{ days} \times 8 \text{ hours} = 27,014 \text{ kilowatt-hours per year}$$

**Describe any other benefits of the renewable energy project.** Please describe and provide sufficient detail on any additional benefits expected to result from the renewable energy project, including:

- Expected environmental benefits of the renewable energy system

This renewable energy source will operate during the months of the peak electrical energy uses usually June- September and could be used to power DWCCC's pump stations. The balance of power generated that is not being used by DWCCC can be sold back to Rocky Mountain Power. This facility will help reduce the need to use more fossil fuels to meet the energy demands of the Company.

- Any expected reduction in the use of energy currently supplied through a Reclamation project

Electricity along the Wasatch Front comes from a variety of sources. Two of these sources is the hydropower at Rockport Reservoir and Echo Reservoir which are

Reclamation projects. It is unlikely that this project will have any impact on hydro power generation from the Reclamation projects in the area.

- *Anticipated beneficiaries, other than the applicant, of the renewable energy system*  
Although this is a small amount of power in the overall scheme of things, the power generated will allow DWCCC to run its pump stations during off peak hours and sell power to Rocky Mountain Power, thus benefiting on a small scale the population along the Wasatch Front. The old saying “every little bit helps” is true in this case, because it is just the beginning of opportunities for renewable energy for DWCCC.

- *Expected water needs of the renewable energy system*  
The small reverse turbine hydro generator will be placed on the existing inlet to the West Point reservoir and will be operated by the water that flows through the canal’s secondary piping into the reservoir. No additional water will be needed to operate the generator and, the generator will not deplete any water resources.

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

*Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping).*

- *Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*

The water savings of 152 acre-feet will reduce the amount of water that will need to be pumped into the system by 152 acre-feet. This would result in a power saving of 63,136 kWh. The power savings are based on the following calculations:

The pumps in the West Point pump station require 177 kW to operate at the design head and pump 2,250 gallons per minute, or 5 cubic feet/second.

The number of hours required to pump 152 acre-feet would be:

$$152 \text{ acre-feet} \times 43,560 \text{ ft}^3/\text{acre-feet} / 3600 \text{ sec/hr} / 5 \text{ cubic feet/sec} = 368 \text{ hours.}$$

This results in an energy savings of  $177 \text{ kW} \times 368 \text{ hours} = 65,136 \text{ kWh}$ .

- *Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?*

There are six 250HP pumps at the West Point Reservoir pump station. Only three pumps run at any given time and pump an estimated 465.45 acre-feet during the hottest months of the irrigation season. The six pumps are rotated to give equal time on the each pump. The each pump at the West Point Reservoir pump station currently pump 5 cubic feet per second. With the reduction of 152 acre-feet needed for the system, DWCCC will have to pump 152 acre-feet less.

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

They are based on the point of diversion for the pump station.

•Does the calculation include the energy required to treat the water?

No. The system does not require treatment of the water.

•Will the project result in reduced vehicle miles driven, in turn reducing carbon emissions? Please provide supporting details and calculations. Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

None

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### **Evaluation Criterion C: Benefits to Endangered Species**

*For projects that will directly benefit federally-recognized candidate species, please include the following elements:*

•What is the relationship of the species to water supply?

The development of this project will allow for more water to be saved and held in Echo and East Canyon Reservoirs and within the Weber River system. After talking with Ben Nadolski from the Utah Department of Wildlife Resources (UDWR), he indicated that if we could allow more water to run down the Weber River during the irrigation season it would help the Bonneville Cutthroat Trout and Bluehead Sucker which are listed on the state's sensitive species list. DWCCC is committed to working with the UDWR and establishing a percentage of the saved water to be released at critical times when the UDWR feels this could enhance the habitat for the Bonneville Cutthroat Trout and Bluehead Sucker. DWCCC has indicated that it would negotiate releasing anywhere from 5% to 10% of the water saved from this project. See a letter of support from the UDWR under Letters of Support

This project will begin decreasing the losses in the pressurized secondary system and will strengthen a working relationship with UDWR, U.S. Fish and Wildlife (USFWS), DWCCC, and Weber River Waters Users Association (WRWUA) by implementing guidelines and requirements which will allow for more water to remain in the Weber River system and Echo and East Canyon Reservoirs. This would allow for better water quality within the water use zones of the Weber River.

Based upon information obtained from UDWR, there are recent documented occurrences of the Bonneville Cutthroat Trout within a 2 mile radius of the Weber River in the area near Echo Reservoir. As well as recent occurrences for the bald eagle and bluehead sucker within ½ mile of the Echo reservoir all of which are included on the Utah Sensitive Species List. Although this project does not directly enhance the habitats for the species listed above, it is proven and documented that by allowing for more available water to stay within the habitat areas for longer periods of time, these species are benefited.

Information obtained from the most recently developed Environmental Report, being submitted to Reclamation at the end of January 2015 that includes listings in this project area, shows the following being listed:

Federally Listed and Endangered (E), Threatened (T), and Candidate (C) species that could be positively affected by additional water supply. The U.S. Fish and Wildlife Service identify these species as known and are believed to be in Davis, Weber, Morgan and Summit Counties.

(C) Greater Sage Grouse (*Centrocercus urophasianus*)

(C) Yellow Billed Cuckoo (*Coccyzus americanus*)

(C) Least Chub (*Lotichthys phlegethontis*)

(E) June Sucker (*Chasmistes liorus*)

(T) Canada Lynx (*Lynx canadensis*)

*•What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of these species?*

Low stream flows affect many aspects of the Weber River and Echo Reservoir, whether above the headworks of DWCCC or below them. Over the past several years major improvements to the canal system has allowed increased flows and higher water quality within the Weber River. This allows for increased benefits to all listed and non-listed fish species. While it is unknown as to the effect this project will have on other species besides the Bonneville Cutthroat Trout and the Bluehead Sucker the ability to conserve water and make it available in the Weber River and Echo Reservoir will allow for better flows and take necessary steps in the right

direction to protect and conserve native species. With DWCCC's relationship with the UDWR we will be establishing a percentage (5% to 10%) of water, saved from this project, which can be delivered to the river at the most critical times or of the year.

*For projects that will directly accelerate the recovery of threatened or endangered species or address designated critical habitats, please include the following elements:*

*(1) How is the species adversely affected by a Reclamation project?*

N/A

*(2) Is the species subject to a recovery plan or conservation plan under the ESA?*

Both species are covered by conservation agreement that the State of Utah has entered into with the U.S. Fish and Wildlife Services. The population status of these two sensitive species warrants additional conservation efforts to diminish the likelihood of future listings under the endangered Species Act.

*(3) What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

This project alone will not reduce the likelihood of listing but it is a step in the right direction. The Company and UDWR are willing to work together to allow for more water to flow at some of the most critical times of the year. This alone could improve the habitat and enhance the continuity of the Weber River.

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## **Evaluation Criterion D: Water Marketing**

*Estimated amount of water to be marketed*

DWCCC will set aside 20% of the conserved water 30 acre-feet of water for new customers. The remaining conserved water will be used to back-up the water right in times of drought or water shortage with a portion (5% to 10%) being used to benefit habitats negotiated with UDWR.

- *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)*

DWCCC provides pressure irrigation to 5 cities. When development comes the developer is required to bring in irrigation water as shares or acre feet. If water is not available for these properties, they have the option of purchasing shares, if available for purchase, or contracting for wholesale water through the Weber

Basin Water Conservancy District. DWCCC will offer a portion of the conserved water resulting from this project available to those property owners located within DWCCC's existing service area to be made available to contract for delivery through their pressure irrigation system. These property owners would all be new customers to DWCCC.

Currently, there is approximately 98 acre-feet of WBWCD wholesale water delivered to users through the DWCCC system and by making a portion of this conserved water available WBWCD (a Reclamation Project) can free up water for other uses in their system.

- *Number of users, types of water use, etc. in the water market*  
The 30 acre-feet could supply lawn and garden irrigation water to approximately 30 new customers just with the development of this project. As DWCCC continues to meter the entire secondary system, the Company could potentially have a savings of 3,300 acre-feet. With 20% of those savings, the company could possibly supply water for an additional 630 new users. All the water would still be considered agricultural water and be supplied to users through the pressure irrigation system.
- *A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)*  
Utah State law does not currently allow for water marketing. However, marketing this water to new customers within the existing service areas as described above does not violate any state laws.
- *Estimated duration of the water market*  
There would be no time limit on the duration of the water market. This conserved water would be treated just as the WBWCD wholesale water and would remain in the system as long as it can be beneficially used.

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## **Evaluation Criterion E: Other Contributions to Water Supply Sustainability**

### **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 Weber River Basin Plan of 2009 indicates, in Chapter 4 of the plan, several conservation goals that they would like to implement, most of which, this project

will help to satisfy. The specific goal that this project will help implement is to help reduce outdoor use through better monitoring and more efficient application and delivery of the water.

Weber River Waters Users Association (WRWUA) developed a “Water Management and Conservation Plan” in 2009 with a Reclamation grant, addressing the needs for the Weber River Basin. Within the Plan, Section 6, Issues and Goals; Issue 2, Condition of Existing Facilities, addresses aging water facilities, being proactive in caring for its facilities and encouraging those who carry Project water to upgrade their conveyance systems.

This project will help to fulfill Goal 5 in Section 7 of the plan. (See Attachment B Planning Documents) Within the Weber River Water Users’ 2009 Water Management Plan, Goal 5 addresses the support of an upgrade of DWCCC facilities. This goal indicates that DWCCC has made big strides over the past 10 years to do a number of “Capital Improvement” projects. The Plan indicates that WRWUA should work in cooperation with DWCCC to complete the rehabilitation of the canal. It also lists the primary objectives of the projects would be to improve the safety of its structures, conserve water by reducing seepage losses and provide for more efficient operation and maintenance. With significant residential development occurring adjacent to the canal in recent years, public safety has come to the forefront of the WRWUA and DWCCC.

DWCCC completed a SOR for the canal system in October 2013. A copy of the project priorities is included in Attachment B, Planning Documents. The proposed project is included in number 4 and 5 on the SOR High Priorities project list. Project priority number 1 was constructed in 2014 and priority number 2 and a portion of priority number 4 are scheduled for construction in 2015-2016.

DWCCC has a Conservation Plan which includes aspects of this project. They also have Emergency Action and Response Plans, and an Operation and Management Plan, which includes responses during drought or water shortage conditions. They also participated in developing a conservation plan with the Weber River Water Users’ Association, which has recently been updated. (Copies of these plans can be made available upon request)

Other plans this project is consistent with and include is the State Regional Water Plan for the Weber River Basin. In the “Weber River Basin Planning for the Future” document prepared in September 2009 it states:

*“In order to meet future water needs, water planners and managers within the Weber River Basin must promote effective water conservation programs and measures. They must also ensure that agricultural water conversions are transferred to meet both indoor and outdoor urban water needs, and implement innovative water management strategies. This, along with carefully planned water developments, will secure sufficient water for the future.”*

The current DWCCC proposed projects help to fulfill these goals.

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

Include a detailed listing of the fields and acreage that may be improved in the future.

- Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.  
N/A
- Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.  
N/A
- Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.  
N/A
- Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.  
N/A
- Describe the extent to which this project complements an existing or newly awarded NRCS funded project.  
N/A

### **Subcriterion E.3: Building Drought Resiliency**

- Explain in detail the existing or recent drought conditions in the project area. Describe the severity and duration of drought conditions in the project area.



*Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought. Describe the impacts that are occurring now or are expected to occur as a result of drought conditions. Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought. For example, will the proposed project prevent the loss of permanent crops and/or minimize economic losses from drought conditions? Will the project improve the reliability of water supplies for people, agriculture, and/or the environment during times of drought?*

Drought - DWCCC potential shortfalls from drought can and have had an impact on the current water supply. The State of Utah does not have a detailed drought management plan, but has made strides since the severe drought of the late 1990's and early 2000 years. However, extreme concerns exist in the DWCCC service area which caused them to redefine their drought mitigation plans and implementations on an annual basis. In 2012, 2013, and 2014, the snowpack was minimal at best.

The Canal Company was forced to start using their storage water much earlier than normal. The irrigation season was cut short by 14 days in 2013 and 2014 and in 2012 the Company received only 40 days of natural flow from the Weber River for the season. This required the company to request all users to limit their water usage very early in the season and throughout the year. The droughts have severely impacted the amount of storage water available at the end of each irrigation season. It looks like the area could be in a drought situation again this year (2015). If the natural flow rights are not available, the Company may not be able to provide enough water to its end users.

#### **Subcriterion E.4: Other Water Supply Sustainability Benefits**

*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)? Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation. Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?*

Utah Division of Water Rights website indicates that Surface water supplies are generally considered to be fully appropriated in Davis and Weber Counties. New diversions and consumptive uses in these areas must be accomplished through change applications filed on existing rights. Non-consumptive use applications, such as hydroelectric power generation, will be considered on their individual merits.

There is a limited ground-water resource available. New appropriations from the principal aquifer are limited to 1.0 acre-foot per year for fixed-time periods in areas not served by a public supply system. These filings are to connect to public supply

systems when they are available. Large projects must be accomplished by change applications on existing rights. Changes from surface to underground sources, and vice versa, are also considered on their individual merits, with emphasis on their potential to interfere with existing rights and to ensure that there is no enlargement of the underlying rights.

Therefore the Basin is closed for new available rights. This makes it difficult for growing communities in the Basin where DWCCC supplies water. The 2010 Census provides some interesting insights into population growth in Utah and the Weber River Basin water area. According to the Census, two of the four most highly populated counties in Utah are Davis and Weber Counties. Davis County population saw an increase of 28.2% between 2000 and 2010 and Weber County increased by 17.7%.

- *Will the project make additional water available for Indian tribes?*  
N/A
- *Will the project make water available for rural or economically disadvantaged communities?*  
Yes, Sunset City and Roy City are listed as economically disadvantaged communities and they both receive secondary water from DWCCC.
- *Does the project promote and encourage collaboration among parties? Is there widespread support for the project? What is the significance of the collaboration/support?*  
This project has the support of all DWCCC water users, Clearfield City, Sunset City, Syracuse City, West Point City, Layton City, Kaysville City, South Weber City, Riverdale City, West Haven City, Clinton City, Weber Basin Water Conservancy District, Roy Water Conservancy Sub-District, the Utah Board of Water Resources, Weber River Water Users Association, Weber River Water Rights Committee, UDWR, and the Utah State Engineer's Office.
- *Will the project help to prevent a water-related crisis or conflict?*  
Yes, many secondary water users are irritated by the overuse from their neighbors. Without understanding the amount of water that is being used, it is difficult to resolve the issues. This project will educate and validate many complaints over watering and may even help those who complain understand that they may also be over watering.

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

There is always tension when it comes to water. Natural disasters, drought, and over watering and users taking more than what was allocated to them seem to be the major factors in developing tension within any service area. DWCCC has had its share and, will continue to feel the tension especially as demands for more water come from expanding residential growth. However, in the past two years there has been more tension than usual. Lack of water because of the work at Echo Reservoir, the drought situation (irrigation season shortened by 14 days), and water losses within the system increased the tension levels from medium to high.

The tension this past year stems from three issues 1) the drought, 2) water losses in the delivery system, and 3) work on the Echo Reservoir safety of the dams. All of these issues contributed to limited water availability to all the users. The Company has a large project within the next year that will help eliminate many losses within the system giving some relief. However tension between residential users will continue without this project. Education and understanding by residential users of how much water they are really using or wasting is key to reducing many of the conflicts within the DWCCC secondary services areas. Without this project the tension and conflicts will continue to grow and become much worse if DWCCC does not move forward with this project

- *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes. This project will educate secondary water users. Help them think differently about proper water usage and help them become more accountable for their water usage.

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

Yes. The metering and hydro project can be used as an example to other secondary water providers and the sub-recipients of the DWCCC service area that maintain and operate their own secondary water systems.

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

Yes. DWCCC has plans to incorporate metering eventually for all of their customers so that they can realize water conservation across their entire service area.

- Does the project integrate water and energy components?  
Yes. The project has both a water conservation of 152 acre-feet and an energy savings of 65,136 kWh by reducing the need for pumping.

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## **Evaluation Criterion F: Implementation and Results**

### ***Subcriterion No. F.1: Project Planning***

*Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a WaterSMART Basin Study? Please self-certify, or provide copies of these plans where appropriate, to verify that such a plan is in place.*

*Provide the following information regarding project planning:*

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

DWCCC completed a SOR for the delivery system which included developing plans for the secondary water in October 2013. A copy of the project priorities are included in Attachment B. The proposed project is part of number 6 on the SOR High Priorities project list. A number of projects within the SOR plan have already been constructed to help with the water conservation in the delivery system. This project will allow for better conservation in the secondary water irrigation system.

DWCCC has a Conservation Plan which includes aspects of this project. They also have an Emergency Action and Response Plans, and an Operation and Management Plan, which includes responses during times of drought or water shortage conditions. They also participated in developing a conservation plan with the Weber River Water Users' Association, which has recently been updated. (Copies of these plans can be made available upon request)

*(2) Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).*

The Weber River Water Users' Association has a number of goals and issues that this project will help to fulfill. They have been addressed previously and are listed in Criterion E Subcriterion E1. Other plans that this project is consistent with the State Regional Water Plan for the Weber River Basin. In the "Weber River Basin Planning for the Future" document prepared in September 2009 it states:

*“In order to meet future water needs, water planners and managers within the Weber River Basin must promote effective water conservation programs and measures. They must also ensure that agricultural water conversions are transferred to meet both indoor and outdoor urban water needs, and implement innovative water management strategies. This, along with carefully planned water developments, will secure sufficient water for the future.”*

**Subcriterion No. F.2: Readiness to Proceed**

Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.

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

The project is ready to go. The environmental document is expected to be a Categorical Exclusion with design taking place at the same time. The project is located in existing public road easements and in previously disturbed areas. The permits for the small hydro power will be submitted once the project has been awarded. The estimated completion of this project is based on contractual approvals and should take 12 months to complete.

Estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

» **Table 1 Project Schedule**

<b>SCHEDULE</b>	October 2015	November 2015	December 2015	January 2016	February 2016	March 2016	April 2016	May – Oct 2016	Nov – Dec 2016	Jan – March 2017	April – Sept 2017
<i>Milestone/Task</i>											
FERC Permit Application Submitted											
Sign WaterSMART contracts											
Environmental Document											
Project Design											
Project Bid											
Project Award											
Construction											
Small hydro Project											
Final reporting and project close out											

Please explain any permits that will be required, along with the process for obtaining such permits. Identify and describe any engineering or design work performed specifically in support of the proposed project.

An application for the FERC permit will need to be submitted. It is expected to take 3 to 6 months to obtain the permit. The Company is anticipating qualifying for a "Qualified Conduit Hydropower facility" under the provisions of the Hydropower Regulatory Efficiency Act of 2013 or a Conduit Exemption. No other permits will be required.

### **Subcriterion No. F.3: Performance Measures**

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

There are two areas of this project where performance measures can be documented and quantified to show the actual benefits upon completion of the project. They include renewable energy that will be generated and water that is saved and/or better managed.

#### **Energy Generated Performance Measures**

The energy produced by the reverse pump turbine will be metered. The metered output will be recorded monthly and compared to the estimation of power generated in this application.

#### **Water Savings and/or Better Water Management Performance Measures**

All water entering the secondary water system is metered. DWCCC has records for 6 years of reliable flows into their secondary system. The flows into the system are tracked on a monthly basis. The difference between the water currently used and the water used after meters are installed will be calculated. This difference will be used to compare to the 118 acre-feet shown in this application.

### **Subcriterion No. F.4: Reasonableness of Costs**

Please include information related to the total project cost, annual acre-feet conserved, energy capacity, or other project benefits and the expected life of the improvement(s).

Total project cost: \$ 750,200

Annual acre-feet conserved (or better managed): 15,040 acre-feet will be better managed and 152 acre-feet conserved, which will begin similar future water and energy efficiency and savings projects.

For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g.,

manufacturer's guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.).

**Expected life of the improvement:** Meters 20 years

**Support for expectation:** (Please see Attachment C Technical Support)

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**Evaluation Criterion G: Additional Non-Federal Funding**

\$450,200.00 Non-Federal Funding  
\$750,200.00 Total Project Cost  
= 60%

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**Evaluation Criterion H: Connection to Reclamation Project Activities**

(1) *How is the proposed project connected to Reclamation project activities?*

Weber Basin Water Conservancy District is a major shareholder in DWCCC and supplies water to Reclamation projects. Water supplies for the DWCCC canal come from East Canyon and Echo Reservoirs which are both Reclamation projects.

(2) *Does the applicant receive Reclamation project water?*

Yes. DWCCC receives water from Echo and East Canyon Reservoirs, which are Reclamation projects.

(3) *Is the project on Reclamation project lands or involving Reclamation facilities?*

No.

(4) *Is the project in the same basin as a Reclamation project or activity?*

Yes, the project is located in the Weber River Basin where Echo and East Canyon Reservoirs are located.

(5) *Will the proposed work contribute water to a basin where a Reclamation project is located?*

Yes, the project will conserve water that can now be held over in Echo and East Canyon Reservoirs contributing to the storage and potential flow of the Weber River.

(6) *Will the project help Reclamation meet trust responsibilities to Tribes?*

No.

## Environmental and Cultural Resources Compliance

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

Impacts will be those associated with installing meters in existing valve trench areas. The proposed project improvements will take place entirely within the existing road right-of-ways. In the past similar projects have had minimal impacts. The surface vegetation will be restored upon completion of the project.

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?*

DWCCC is not aware of any impacts concerning threatened or endangered species in this area. As part of the environmental document an inventory will be completed as part of the submitted environmental document.

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.*

DWCCC is not aware of any impacts to wetlands or if there are any wetlands in the area. As part of the environmental document, an inventory will be completed as part of the submitted environmental document.

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

As part of the completed environmental document the required historical documentation for the project locations will be completed.

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

This project will install 700 secondary water meters in West Point City and Clinton City within the existing valve locations and install a 20kW reverse pump hydro turbine at the West Point Reservoir existing pump station.

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.*

DWCCC is not aware of any building, structures or features that would be impacted or would qualify. A cultural resource inventory will be completed as part of the submitted environmental document.

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

DWCCC is not aware of any impacts to any archeological sites or if any exist in the area. An archeological resource inventory will be completed as part of the submitted environmental document

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

No. The project would not require a right-of-way or relocations from adjacent properties and would have no impact on residential uses within the study area.

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

No.

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

No.

## Required Permits or Approvals

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*Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.*

A FERC permit will be required for the reverse pump hydro turbines, including a power sales agreement. These documents will be prepared when the application is awarded.

# Letters of Project Support

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Utah Department of Wildlife Resources Ben Nadolski

# Official Resolution

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Official Resolution with be forwarded by February 23, 2015

# Project Budget

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## Funding Plan and Letters of Commitment

1. *How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).*  
DWCCC will use money from their own Secondary System Construction Reserve Account for their contribution. The only in-kind cost which will be included is the cost to prepare the WaterSMART application.
  
2. *Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include: What project expenses have been incurred*  
DWCCC's in-kind expenses include the cost to prepare the WaterSMART application.
  - a) *How they benefitted the project*  
Preparations for application included the water loss analysis and mapping to help prepare the WaterSMART application.
  
  - b) *The amount of the expense*  
\$ 4,000.00 Grant Preparation
  
  - c) *The date of cost incurrence*  
December 1, 2014 to January 23, 2015
  
3. *Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.*  
No letters of commitment will be necessary as all cost sharing will come from the Davis and Weber Counties Canal Company Secondary System Construction Reserve Account.
  
4. *Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.*  
N/A
  
5. *Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.*

No other funding requests have been made. DWCCC already has the funds for their cost-sharing portion for this project.

<b>Funding Sources</b>	<b>Funding Amount</b>
<b>Non-Federal Entities</b>	
<i>Recipient Funding</i>	450,200.00
<i>Non-Federal Subtotal</i>	
<b>Other Federal Entities</b>	
<i>N/A</i>	
<i>Other Federal Subtotal</i>	0.00
<i>Requested Reclamation Funding:</i>	300,000.00
<b>TOTAL PROJECT FUNDING</b>	<b>750,200.00</b>

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### **Budget Proposal**

<b>Funding Sources</b>	<b>Percent of Total Project Cost</b>	<b>Total Cost by Source</b>
<b>Recipient Funding</b>	60%	\$450,200
<b>Reclamation Funding</b>	40%	\$300,000
<b>Other Federal Funding</b>	0%	\$0.00
<b>TOTALS</b>	100%	\$750,200

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Budget Item Description	Computation		Quantity Type	Total Cost
	\$/Unit	Quantity		
Salaries & Wages	\$0.00	-	-	\$0.00
Fringe Benefits	\$0.00	-	-	\$0.00
Travel	\$0.00	-	-	\$0.00
Equipment	\$0.00	-	-	\$0.00
Supplies and materials	\$0.00	-	-	\$0.00
Contractual /Construction				
Design 7%	\$32,750.00	1	EA	\$32,750.00
Public Involvement/Construction Observation 7%	\$32,750.00	1	EA	\$32,750.00
Furnish and Install Meters	\$910.00	700	EA	\$637,000.00
Hydropower Generation	\$18,000.00	1	EA	\$18,000.00
Other				
Reporting	\$100.00	32	HR	\$3,200.00
Legal	\$285.00	10	HR	\$2,850.00
Pre-Award Costs – Application Preparation	\$ 4,000.00	1	LS	\$4,000.00
Environmental Document 3%	\$19,650	1	EA	\$19,650
<b>Total Direct Costs</b>				<b>\$750,200.00</b>
Indirect Costs	\$0.00	-	-	\$0.00
<b>Total Project Costs</b>				<b>\$750,200.00</b>

## Budget Narrative

### *Salaries & Wages*

No DWCCC Salaries or Wages will be included as part of this project. All services will be contracted. DWCCC's staff time will be over and above the cost of the project and will not be counted toward the project cost.

### *Fringe Benefits*

No fringe benefits will be required.

### *Travel*

No travel will be required.

### *Equipment*

Equipment will be part of the contracted portion of the project.

**Materials and Supplies**

Materials and Supplies will be part of the contracted portion of the project and will be documented as required.

**Contractual**

In order to determine unit costs which were included in the cost estimate for this project, DWCCC relied upon unit prices from a similar project recently completed in by the Weber Basin Water Conservation District 2013-14.

The contractual costs shown are estimates for each of the components to furnish and install all the equipment.

Contractual will include design at 7% and Public Involvement/Construction Observation at 7%. The Contractor will be hired to install the meters and hydropower generation.

**Environmental and Regulatory Compliance Costs**

The environmental document for this project will be 3% of the cost of the project.

**Reporting**

Reporting costs shown in the application are estimated charges from the project engineer. DWCCC is not requesting any credit or reimbursement for any in-house employee costs for preparing or submitting the necessary reports. DWCCC is contributing their time to the project over and above the required match. Reports will be done by the project engineer for the DWCCC project. The cost is \$3,200.00 and the project engineer has been allowed 32 hours to prepare all the reports at \$100.00 per hour.

**Other Expenses**

Legal Counsel to review the contracts, power sales agreement, and advice on the bid process for the project is a total of \$2,850.00 = 10 hours at \$285.00 per hour.

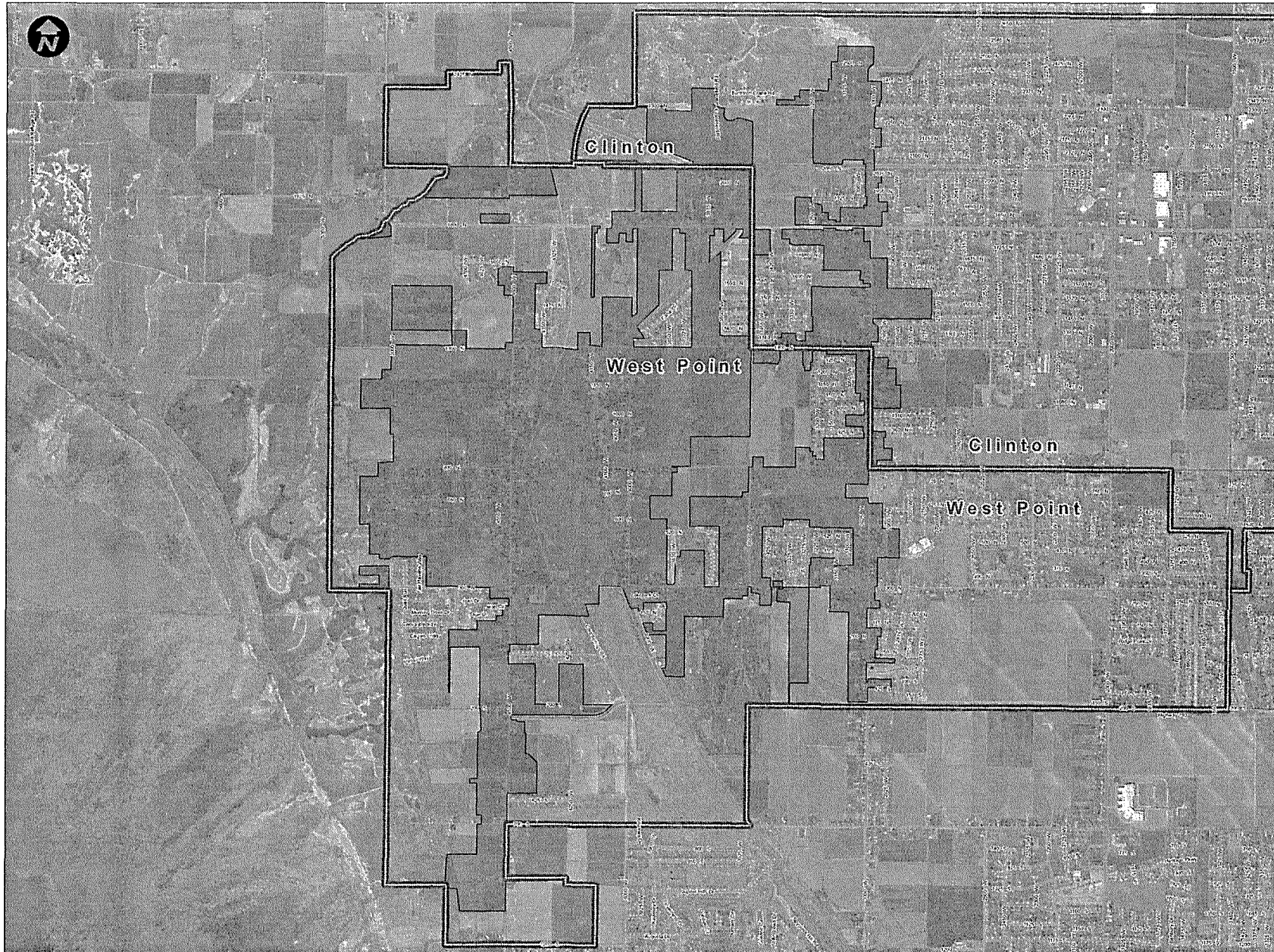
**Indirect Costs**

No, indirect cost will be part of the project.

**Total Costs**

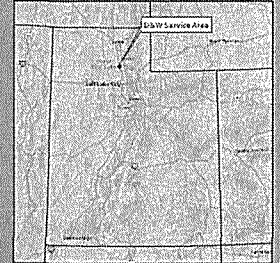
DWCCC Portion	Fed Portion	Total
\$450,200	\$300,000	\$750,200







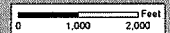
**Davis and Weber  
Canal Company**

Attachment A  
Project Location  
and Meter  
Replacement  
Boundary Map



**Legend**

-  Meter Replacement Boundary
-  City Boundaries



**Davis & Weber Counties Canal Company****Priority Projects**

9/30/2013

**High Priority Projects**

Priority	Proposed Improvement	Estimated Construction Year	Estimated Replacement Cost
1	Secondary Water Meters	2014-2024	\$ 14,000,000.00
2	Slip-line Fife Ditch/Second Feed from Sunset Reservoir	2015	\$ 2,000,000.00
8	Kaysville Irrigation Company Reservoir Pump Station & Piping (2016-2020; \$4M)	2016-2020	\$ 4,000,000.00
9	Fairfield to Flint Transmission Pipeline (2018; \$3.4M)	2018	\$ 3,400,000.00
3	West Point 1300 North Reservoir & Pump Station (2020; \$6M)	2020	\$ 6,000,000.00
4	Supply Line from Layton Canal to 1300 N. Reservoir (2020; \$330K)	2020	\$ 330,000.00
10	Weaver Lane to Angel Street Pipeline (2020; \$1M)	2020	\$ 1,000,000.00
5	1300 North Parallel Pipeline (2022; \$1.1M)	2022	\$ 1,100,000.00
6	2300 North Parallel Pipeline (2024; \$300K)	2024	\$ 300,000.00
7	2050 North New Pipeline (2025; \$300K)	2025	\$ 300,000.00
11	23E Storage Facility (2022; \$2.3M)	2025	\$ 2,300,000.00
		Total	\$ 34,730,000.00



# System Optimization Review

## Davis and Weber Secondary Water Master Plan

### INTRODUCTION AND BACKGROUND

In approximately 1987, the Davis and Weber Counties Canal Company began planning, designing, and constructing a secondary water system to deliver to lawns and gardens in the rapidly growing urbanized area. As farmlands converted to subdivisions of homes and businesses, the same irrigation water was planned to be delivered to the area via the secondary water system to supply the outdoor water demands of landscaping. The installation of the secondary water system has helped local communities maintain culinary water contracts and lessen larger system upgrades. It provides for the larger, outside demands with its own non-treated water delivery system.

The D&W secondary water system has grown over the years. The System is found in 5 communities, Kaysville, Layton, West Point, Clinton, and South Weber with approximately 14,375 connections with 15,204 acre-feet of water dedicated to the secondary water system. The majority are residential connections, with other connections serving open spaces, commercial and institutional (schools and churches) establishments.

As the areas continue to grow, the System will need to be improved to provide sufficient piping and storage facilities. D&W estimates that they will need an additional 10,000 secondary water connections in order to meet the needs of growth in the next ten years within their service area. D&W desires to account for the water being delivered by metering at the canal/reservoir turnouts and ultimately all connections to encourage water conservation and to educate the Public further.

### PROJECT PRIORITIES

The Project Priorities for the Secondary Water System are as follows.

Below is a non-inclusive list of potential future projects (with anticipated dates & costs):

- Secondary Water Meters (2014-2024; \$14M)
- Slip-line Fife Ditch/Second Feed from Sunset Reservoir (2015; \$2M)
- West Point 1300 North Reservoir & Pump Station (2020; \$6M)
- Supply Line from Layton Canal to 1300 N. Reservoir (2020; \$330K)
- 1300 North Parallel Pipeline (2022; \$1.1M)
- 2300 North Parallel Pipeline (2024; \$300K)
- 2050 North New Pipeline (2025; \$300K)
- Kaysville Irrigation Company Reservoir Pump Station & Piping (2016-2020; \$4M)
- Fairfield to Flint Transmission Pipeline (2018; \$3.4M)
- Weaver Lane to Angel Street Pipeline (2020; \$1M)
- 23E Storage Facility (2022; \$2.3M)

# iPERL™ Water Management System

## Specifications

### TYPE

Solid state, battery operated electromagnetic flow measurement system with a hermetically sealed, glass covered, electronic register with a programmable 9-digit display.

### CONFORMANCE TO STANDARDS

Must conform to American Water Works Standard C-700 and C-710 as most recently revised with respect to accuracy and pressure loss requirements, or other appropriate American Water Works Standard. Must be compliant with NSF/ANSI Standard 61 Annex F and G.

### REGISTER

The register must be an electronic device encapsulated in glass with 9 programmable digits utilizing a liquid crystal display (LCD). It will have indicators for flow direction, empty pipe, battery life and unit of measurement. The register must be hermetically sealed with a heat tempered glass cover and be tamperresistant. The register shall not be removable from the measuring sensor. The register shall utilize a magnetic coupling technology to connect to a touch read, radio read or fixed base meter reading system in either an inside or pit set installation.

### MEASURING ELEMENT

The measuring element shall be made of a noncorrosive, lead-free glass fiber reinforced, composite alloy material. A battery powered magnetic flow sensor utilizing silver/silver chloride electrodes will be utilized to measure the velocity of the water which is linearly proportional to the volume. The measuring element will have no moving parts and will be specific for each size.

### EXTERNAL HOUSING

The register and measuring element will be an integrated unit housed within a thermal plastic external casing. This integrated unit will not be removable from the external housing. The systems shall have the size and direction of water flow through the system imprinted on the external housing.

### PRESSURE CAPABILITY

System shall operate up to a working pressure of 200 pounds per square inch (psi), without leakage or damage to any parts. The accuracy shall not be affected by variation of pressure up to 200 psi.

### PERFORMANCE WARRANTIES

In evaluating bid submittals, warranty coverage will be considered. All bidders are required to submit their most current nationally published warranty statements for water meter maincases, registers and measuring chambers.

### OPERATING CHARACTERISTICS

Under normal operating conditions, the unit shall be calibrated for flow as low as:

Sizes	Starting Flow (GPM)	Low Flow Range (+/-3%)	Normal Operating Range (+/-1.5%)	Pressure Loss (Not to Exceed)
5/8"	0.03	>0.11<0.18	0.18 to 25	4psi @ 15gpm
5/8" x 3/4"	0.03	>0.11<0.18	0.18 to 35	2psi @ 15gpm
3/4" Short	0.03	>0.11<0.18	0.18 to 35	2psi @ 15gpm
3/4" Reg	0.03	>0.11<0.18	0.18 to 35	2psi @ 15gpm
1"	0.11	>0.3<0.4	0.4 to 55	2psi @ 25gpm

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