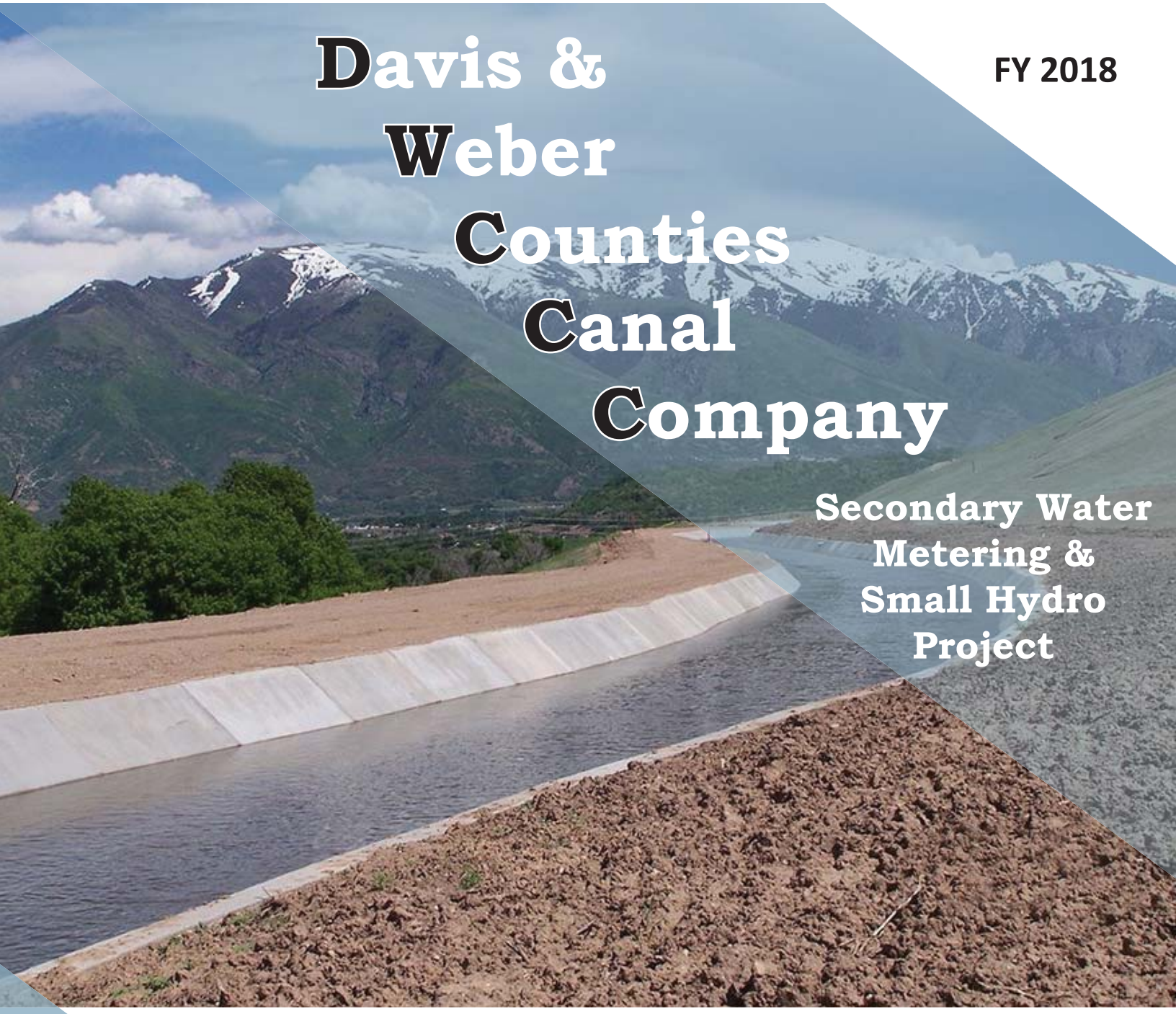
WaterSMART Grants: Water and Energy Efficiency Grants
FOA# BOR-DO-18-F006



Davis & Weber Counties Canal Company

FY 2018

Secondary Water Metering & Small Hydro Project

Applicant

Rick Smith, Manager
Davis & Weber Counties Canal Company
138 West 1300 North
Sunset, Utah 84015

Project Manager

Bryce Wilcox, PE
466 North 900 West
Kaysville, Utah 84037
801-547-0393
bkw@jub.com

Table of Contents

Attachments

Technical Proposal and Evaluation Criteria

Executive Summary

Applicant Info

Date: May 10, 2018

Applicant Name: Davis and Weber Counties Canal Company (DWCCC or Company)

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

Project Manager:

Bryce Wilcox, P.E.
Project Manager
801-547-0393
bkw@jub.com

Project Funding Request: Funding Group I, $300,000; Total Project Cost, $750,000

Project Summary

Specify the work proposed, including how 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 Davis and Weber Counties Canal Company (DWCCC) Secondary Water Metering and Small Hydro Project will install 600 secondary water meters and a 4kW small hydropower generation turgo turbine. 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 155 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 areas within Clinton City and West Point City for this project. The small hydro turbine will be located at DWCCC's secondary water reservoir which will generate 3,600-kilowatt hours (kWh) of power per year allowing the DWCCC to add even more power generation to its already wide range of small hydro successes. The project contributes the goals of the FOA by conserving water with a measurable 155 acre-feet of water savings from metering its secondary users and by adding to the production of power to be used by the DWCCC to power its facilities. This small amount of power may not seem like much but as it is added to the other small hydro and solar projects that DWCCC has installed is just one more step toward offsetting the electricity used annually by the Company. The installation of this hydro unit will bring DWCCC total power production to 62,659 kWh of electricity annually. That is enough power generated to run six homes a year in Utah (average electricity use is around 10,602 kWh per year).

Length of Time and Estimated Completion Date

State the length of time and estimated completion date for the proposed 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. In past metering project, DWCCC has had a Categorical Exclusion approved based on the fact that the project will take place in previously disturbed areas and within existing road alignments and right-of-ways. It is anticipated that it will be a similar situation.

The permits for the small hydropower facility have already been submitted, and the power sales agreement with Rocky Mountain Power has been completed.

The project will require a minimal amount of design and is ready to go as soon as the contracts are signed. DWCCC anticipates that contracts will be signed between September and December 2018 and that the environmental document can begin by January 2019. The environmental document will take three to six months (January 2019 – July 2019). The design is estimated to take 2 months (June 2019 – July 2019). The meters and hydropower need to be installed outside of the irrigation season (April 15- October 15th) and will require six months complete (October 2019 – April 2020). The project will be closed out by September 30, 2020. The project will be accomplished within the two-year allowance.

Below is an estimated project schedule that shows the stages and duration of the proposed work, including yearly funding, major tasks, milestones, and dates:

SCHEDULE	Sept – Dec 2018	Jan – June 2019	June – Sept 2019	Oct – Dec 2019	Jan – Feb 2020	Mar - Apr 2020	May – Sept 30, 2020
Milestone/Task							
Sign WaterSMART contracts							
Environmental Document prepared and approved by Reclamation							
Meter Design and Project Bid/Award and Hydropower design							
Meter and hydro installation							
Final reporting and project close-out							

Federal Facility

Whether or not the project is located on a Federal facility.

The project is not directly located on a federal facility. However, DWCCC receives water from the Echo and East Canyon Reservoirs, which are owned by Reclamation. This project will permit better management of DWCCC's water, allowing water to stay in the reservoir longer during the irrigation season, which can benefit habitats and recreational opportunities within the reservoir.

Background Data

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 users within Clinton City and West Point City.

Water Supply

Describe the source of water supply, the water rights involved, current water uses (e.g., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in the water supply. If water is primarily used for irrigation, describe major crops and total acres served.

Source of water supply and water rights involved.

The source of DWCCC's water supply is from the direct flow rights of the Weber River, which is supplied from reservoir storage in the Echo and East Canyon Reservoirs. Water is delivered through a series of canals, ditches, and low and high-pressure pipelines from the main canal.

Direct flow water rights from the Weber River, based upon the flow of the river for direct use, are as follows:

- Flood 433 cfs,
- High Water 216 cfs
- Low Water 133 cfs
- Storage rights of 57,154 acre-feet (28,000 from East Canyon Reservoir and 29,154 from Echo Reservoir)

The 5-year average annual water rights available is 63,758 acre-feet. The average annual use delivered through the canal system is 48,743 acre-feet. The remaining portion (15,016 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 32,000 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 14,206 connections in the secondary water system operated by DWCCC. In 2017, there were 13,000 acre-feet of water dedicated to the secondary water system.

Current and projected water demand/potential shortfalls in water supply.

Current demands are for approximately 64,000 acre-feet of water. The Company has seen significant changes in safety requirements and laws regarding water use and water rights. Local laws and policy changes, terrorist threats, and natural disasters, including potentials for residential property flooding have reminded the Company of the external risks and demands placed upon them and their water supply. 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 use conversions continue throughout the DWCCC service area.
- 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 projected earlier. 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 initially anticipated.
- Water to service the fast-growing Summit County area. 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. Their thirst for water is growing at staggering rates and will have a significant impact upon demands on available existing DWCCC water supplies.

Potential shortfalls in water supply: DWCCC faces potential shortfalls in four main areas:

1. The principal potential shortfall for the Company is water losses that could cause potential flooding to residents through the main canal. These losses have impacted water delivery in past drought years, which has caused significant shortages. Four of the last five years (2012-16) have been considered drought years. With the number of water losses in the system, many users downstream have been impacted. These losses impact deliver to the secondary water users as well as to the agricultural users and effects water delivery in drought years which has caused considerable shortages to all users.

   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 1990s and early 2000s. 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 - 2016, the snowpack was minimal at best, which supplies reservoir storage. The Company was forced to start using their storage water much earlier than usual. In 2015, Utah had the hottest winter on record with the snow melt happening in March – three months earlier than usual, cutting water to the lowest allocation in 30 years.

Echo Reservoir during a drought year

The irrigation season was cut short by fourteen days in 2013, 2014, and 2015. In 2012, the Company received only forty days of the natural flow of the Weber River for the season. This required the Company to request that all users limit their water usage very early in the season and throughout the year.

The Company evaluates its drought situations and operational procedures each year, including its management decisions for existing water supply conditions. DWCCC gathers data and identifies potential areas of concerns by monitoring flow rates at various locations on a regular basis, which includes correlation with other entities. The amount of water available for delivery is determined each year by natural flow rights and storage rights.

The drought has severely impacted the amount of storage carryover water that has been available at the end of the irrigation season, and during the past few years of drought, the natural flow rights were limited or not available. The transmission losses on the lower main canal will complicate the already severe water shortages. Extreme overuse by secondary water users tend to increase these shortages.

3. Growth - Within the past ten years, DWCCC's service area has seen significant population increases with many new residential housing developments, businesses, schools, and churches. Davis and Weber Counties are listed as two of the fastest growing counties in Utah. Both of these counties are served by DWCCC water. Further evidence of growth is shown in the conversion of water used for agriculture purposes to that of residential lawn and garden applications. In 1995, agricultural water usage was 80 percent of the total water used, whereas today, the use is approximately 55 percent; according to the Governor of Utah Water Task Force Committee. The 25 percent 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. This demand could have significant impacts on the Company's ability to provide water for new customers in their service areas. 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.

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

The DWCCC supplies both pressure irrigation for lawn and garden irrigation systems and water for agricultural irrigation. The major agricultural crops are corn, grains, alfalfa, row crops such as watermelons, pumpkins, tomatoes, etc. With serving nearly 65 different ditch companies and thousands of residential lawn and garden users, it is difficult to estimate the total acres of agricultural lands served.

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 (e.g., 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 39.4% of this capacity)

Canal System

- River Diversion includes four 18-foot wide radial gates across the Weber River to divert water into the DWCCC forebay channel
- Forebay channel includes trash racks, a canal gate that controls the flow into the main canal, and an overflow crest gate structure that diverts excess water back into the Weber River, which helps control deliveries and fish flow protection.
- The DWCCC canal system consists of 17.2 miles of main canal, which is defined as the upper main canal and the lower main canal sections, and includes:
    - No liner or Deteriorated 100-Year-old liner – 4.3 miles
    - 1980's and 1990's Non-Reinforced Concrete Open Canal Liner – 2.2 miles
    - 2001 to 2011 Reinforced Concrete Open Canal Liner – 4.1 miles
    - Enclosed Pipe or Box Culvert – 6.2 miles
    - Box Culverts under Highways and Freeways – 0.4 miles

Section of open canal in the delivery system

- 60 diversion gates and siphons servicing 65 different ditch companies

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 District with a 125 acre-feet 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 City with three water storage reservoirs that total 106 acre-feet water storage capacity

Energy Efficiency

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

The DWCCC is supplied power by the Rocky Mountain Power Company and uses approximately 464,366 kWh of electricity annually throughout its system. To help offset the electricity usage DWCCC has been installing solar and hydroelectric facilities. DWCCC has been working hard to offset their usage over the past couple years by installing the following.

- 2 Smart Hydro 2kW turbines generating a total of 17,568 kWh per year (installed 2017)
- 2 Cross float 2 kW Turbines Generating a total of 17,568 kWh per year (to be installed June 2018)
- 2 Hydro-Power Pelton Wheel 4kW Turbines generating a total of 7,200 kWh per year (installed April 2018)
- 9.92 kW Solar array generating 16,723 kWh per year (to be installed May 2018)

These facilities will help offset 59,059 kWh of electricity annually.

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 project(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 the 1964 expansion 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 15,016 acre-feet.

In 2017, DWCCC received a WaterSMART Energy Efficiency Grant for $1,000,000. The Project includes piping 3,220 feet of unlined earthen canal with two 66-inch diameter pipes, 500

feet of earthen canal with a single 66-inch diameter pipe; and installing a 10kW solar array. The project will save 733 acre-feet of water and produce 16,723 kWh of power annually.

In 2016, DWCCC received a WaterSMART Energy Efficiency Grant for $300,000. The project included piping 950 feet of 100-year-old deteriorated canal liner, with an 8-foot wide by 7-foot high reinforced concrete box culvert, and a 2kW small hydropower generation turbine at key locations to generate 8,784 kWh of power per year for each project. The piping portion of this project is nearing completion, and the hydropower portion will be constructed in June 2018.

In 2015, DWCCC received two WaterSMART Energy Efficiency Grants for $300,000 each. The projects included installing 650 secondary water meters and piping 2,000 feet of open, unlined canal. Both projects include small hydropower generation turbines at key locations to generate 11,664 kWh of energy per year.

In 2014, DWCCC 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 box culvert and large diameter RCP pipe in the main canal and the installation of two 5 kW small hydropower generation turbines at key locations to generate 8,784 kWh of energy per year.

In 2011, DWCCC received a WaterSMART System Optimization Review grant. This Plan was completed in 2013 and has identified the project priorities in the canal water system. The SOR is reviewed and updated as needed. This canal project has been designated as a top priority in the 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 also included 3,250 feet of two 66-inch diameter RCP pipes, 500 feet of three 66-inch 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 throughout DWCCC’s system.

New Headwork's Structure Funded with Challenge Grant Funds

Project Location

Provide specific information on the proposed project location or project area including a map showing the geographic location. For example, {project name} is located in {state and county} approximately {distance} miles {direction, e.g. northeast} of {nearest town}. The project latitude is {##°##'N} and longitude is {###°##'W}. For larger project areas, please provide location information in one of the following formats: 1. Shapefile (.shp), 2. KMZ/KML (.kmz or .kml) aka Google Earth File, not an exported GoogleEarth map, 3. AutoCAD (.dwg), 4. PDF map (.pdf)

Geographic Location

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 project will be located in the cities of Clinton and West Point Utah. The project location and latitude and longitude are shown in the attached maps. See Attachment A – Project Location Map, and Attachment B – Project Detail Map for project information.

Technical Project Description

Describe the work in detail, including specific activities that will be accomplished. 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 23% of Davis and Weber Counties Canal Company's total water usage. Within the DWCCC's secondary water service area over 13,000 acre-feet of water is used for secondary irrigation.

The area of most promise for water savings comes from 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 several years since they implemented their metering projects. Within WBWCD's "Secondary Water Metering Report. December 2017" they found that on average, water usage on metered irrigation connection's was reduced by 30% when compared to unmetered usage. Many of their customers have similar acreages and lot sizes that are similar to DWCCC's secondary water customers.

In 2016 and 2017, DWCCC installed 650 meters in Clinton and West Point cities. This project will connect onto the previous project and expand the area of meters. This project has been identified in the Capital Facilities Plan to generate substantial conservation which will be sustainable year after year.

Over use of secondary water on pastures

Current retail irrigation water is allocated at 3 acre-feet per acre, and users are charged based on lot size, and not on the amount of water used. It is not entirely 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 to 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 a continuation of a previous metering project. 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.

E.1. Technical Proposal: Evaluation Criteria

E.1.1. Evaluation Criterion A – Quantifiable Water Savings

Quantifiable Water Savings

Describe the amount of estimated water savings*. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

The average annual acre-feet of water supply for DWCCC is approximately 63,758 acre-feet (five-year measured average). 13,000 acre-feet are used for DWCCC secondary water. The West Point and Clinton Cities combined use 7,827 acre-feet of this water. This project is estimated to conserve 155 acre-feet of DWCCC's water supply. When all of the connections are metered, it is anticipated to save 3,900 acre-feet.

Describe current losses. *Explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

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.

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

Weber Basin Water Conservancy District (WBWCD) has been installing secondary water system meters over the past few years. WBWCD published a "Secondary Water Metering Report. December 2017" with their findings. WBWCD showed that with metered connections, the water use was approximately 30% less than the allocated amount. We used this 30% water savings as the basis for our water savings calculations. See Attachment C – WBWCD Secondary Water Article and 2017 Metering Report Conclusion Page.

Municipal Metering:

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.*

   Based on the WBWCD meter report, DWCCC used 30% water savings over the allocated amount as the basis for our water saving calculations.

   The Clinton and West Point system used 7,827 acre-feet of water in 2017. There are also 9,078 of existing connections.

   This gives a rate per connection of 7,826 acre-feet / 9,078 connections = 0.86 acre-feet per connection.

   For 600 meters, the amount allocated would be 600 x 0.86 acre-feet per connection = 516 acre-feet.

   At a 30% savings, the overall water savings is 30% x 516 acre-feet = 155 acre-feet.

   Once all the connections are metered the savings would be 30% x 13,000 acre-feet = 3,900 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 six years. WBWCD published a "Secondary Water Metering Report. December 2017" with their findings.

c. *For installing individual water user meters, 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 10 miles of the proposed project. The 30% water losses have been based on WBWCD experience. WBWCD published a "Secondary Water Metering Report. December 2017" 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?*

600 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 for the last 8 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.

E.1.2. Evaluation Criterion B – Water Supply Reliability

Address how the project will increase water supply reliability. Provide sufficient explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

- *Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?*

  Yes.

  - *Is there widespread support for the project?*

    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.

  - *What is the significance of the collaboration/support?*

    The support of the Cities, State of Utah Conservancy Districts, and all water users will allow DWCCC to work quickly through the process to construct the project. The project will be completed on street right-of-ways owned by Clinton and West Point Cities.

- *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 make water available to address a specific water reliability concern? Please address:*
  - *Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries.*
    The impact to water reliability include:

    Drought: Drought has been a major concern to the reliability of the DWCCC system. A severe drought from 2012 through 2017 put a strain on the DWCCC water system and required them to shorten irrigation seasons. Snowpack for 2018 has not been any better. However this year DWCCC had a good amount of storage carryover in the Echo Reservoir. Drought years in the past have severely impacted the amount of storage carryover water that has been available at the end of the irrigation season, and during the past few years of drought, the natural flow rights were limited or not available. This may be the case this irrigation season. The water losses from seepage, potential flooding, and drought conditions make this a high priority project on the lower main canal.

    Growth: DWCCC's service area has seen significant population increases with many new residential housing developments, businesses, schools, and churches. As some of the fastest growing counties in Utah, Davis and Weber County are both having significant changes in water used for agriculture purposes to that of residential lawn and garden applications. As the population increases in the service area, the need for more culinary and secondary water also increases. This demand could have significant impacts on the Company's ability to provide water to other new customer needs in their service areas which are running short of water based upon drought conditions, insufficient storage, and transmission water losses from unlined or unenclosed distribution systems.

  - *Describe where the conserved water will go/how it will be used. Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)? Will it be left in the river system?*
    The conserved water will provide a more secure water right and be more available as a buffer during times of drought. It will also be available for secondary use as agricultural lands convert to residential lawns and gardens. Opportunities to benefit the environment, and fish and wildlife habitats on the Weber River can be considered which would allow a prolonged and better-balanced stream flows of available water. The conserved water will enable flows to remain in the river system for more extended periods of time and held for longer in the season in the Echo and East Canyon Reservoirs.

DWCCC has always worked closely with local, state, and federal agencies to do their part to make percentages of their conserved water available to instream flows within the Weber River system and will continue to do so. Working with Utah Division of Wildlife Resources, Weber Basin Water Conservancy District, and others DWCCC use conserved water to increase water sustainability within the Weber River.

- *Describe how the project will address the water reliability concern?*
  According to the Weber Basin Water Conservancy District, lawn and garden systems see a reduction of 30% when metered, and the homeowners are educated. This will provide additional water for use during times of drought and will allow the users to more fully use their water right. By metering the amount of water that residential lawn and gardens use, homeowners can be more aware of their water use and better understand the amount their lawn and gardens need and reduce the amount of overwatering.

- *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*
  Yes, many secondary water users are irritated by the overuse from their neighbors and yet not really knowing how much they are using themselves. Without understanding the amount or water that is being used, it is difficult to resolve the issues. This project will educate and validate many complaints about watering and may even help those who complain understand that they may also be overwatering.

- *Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*
  The development of this project will allow for more water to be saved and held in the Echo and East Canyon Reservoirs and within the Weber River system. DWCCC has always worked closely with local, state, and federal agencies to do their part to make percentages of their conserved water available to instream flows within the Weber River system and will continue to do so. Working with Utah Division of Wildlife Resources, Weber Basin Water Conservancy District, and others DWCCC use conserved water to increase water sustainability within the Weber River. See Attachment D – Letters of Support.

- *Describe the roles of any partners in the process. Please attach any relevant supporting documents.*
  DWCCC works closely with the Utah Division of Wildlife Resources, Weber Basin Water Conservancy District, and Bureau of Reclamation for the operation of the diversions on the Weber River and reservoirs. The operations are all coordinated through the Weber River Commissioner. See Attachment D – Letters of Support.

- *Indicate the quantity of conserved water that will be used for the intended purpose.*
  The 155 acre-feet of water that is conserved will all be used to make the water system more reliable. This water will be used within the DWCCC systems to reduce the impact of droughts and water shortages.

- *Will the project benefit Indian tribes?*
  No.

- *Will the project benefit rural or economically disadvantaged communities?*
  Yes, Roy City is served by DWCCC through secondary water services and is listed as an economically disadvantaged community. By saving water and reducing the need to continually increase rates to find new water sources conservation will allow DWCCC to minimize the financial impact on its users.

- *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance). Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.*
  The Bonneville Cutthroat Trout and Bluehead sucker are native fish species found in portions of the Weber River. Both species are covered by conservation agreements that the State of Utah has entered into with the U.S. Fish and Wildlife Service and other parties. The population status of these two sensitive species warrants additional conservation efforts to diminish the likelihood of future listings under the Endangered Species Act.

  UDWR's approach to aquatic species conservation and management in the Weber River, in part, focuses on reconnecting and maintaining connectivity of priority habitats by removing unnecessary barriers to fish migration, or by modifying existing barriers to allow upstream movement of these species, particularly for Bonneville Cutthroat Trout and Bluehead Sucker; many of which have come about by building diversion structures and installing culverts that reduce the ability of fish migration. Many of these barriers originate from the private canal and ditch companies as well as a project built by Reclamation over the years.

  Stable and connecting flows between Bonneville Cutthroat Trout and Bluehead Sucker habitats are a fundamental requirement for conservation actions to be successful. Therefore, most any project that enhances the continuity and maintenance of flows within the Weber River is a step in the right direction. As DWCCC and UDWR work cooperatively to protect and conserve these native species, their habitats will be benefitted.

- *Will the project address water supply reliability in other ways not described above?*
  Water supply reliability is often times more than just getting water to the field. It is having it for purposes like recreation, the environment, or to improve water quality. Within the Weber River Watershed Plan of 2014, it says that "The goal of this plan is to recognize both the human and ecological values that the watershed provides and develop

strategies to protect and enhance those values." Allowing for more water to remain in the Weber River, Echo and East Canyon Reservoirs recreational opportunities will be benefited, water quality will be improved, recreation fishing will be sustainable and economic development will continue. This project along with the other past and future projects that DWCCC has done or will do will all contribute the water reliability to improve the sustainability and economic development of the area.

E.1.3. Evaluation Criterion C – Implementing Hydropower

If the proposed project includes construction or installation of a hydropower system, please address the following:

***Describe the amount of energy capacity**. For projects that implement hydropower 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.*

DWCCC has been on the leading edge of micro hydropower installations in canals in Utah. DWCCC has very low head hydropower sites in their canal and a micro hydropower installation on their secondary water system. DWCCC installed two 4kW HI-Power turgo hydropower turbines in April 2018 on their secondary water system at a pump station. They have applied for a qualifying conduit exemption from FERC for the hydropower site. The hydropower for this application is included in the submitted FERC permit application. No additional permits will be required. Environmental clearances have all been done as well for this site.

The reservoir attached to the pump station can be filled from the system during off-peak times. The pumps only operate in peak times. The system that will operate the turbine has approximately 300 feet of elevation head.

DWCCC will install a 4kW HI-Power turgo hydropower turbine as part of this application. It will be installed in the same pump station as the existing two hydro turbines. These small hydropower generation sites have shown to provide a good source of renewable energy to help offset the 464,366 kWh of electricity that DWCCC uses annually.

***Describe the amount of energy generated.** For projects that implement hydropower 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 HI-Power turgo hydropower turbine is rated at 4kW. The hydropower turbine will operate for 720 hours. The pump station typically operates for 90 days from June to August and the turbines will fill the reservoir during off-peak times from 10:00 am to 8:00 pm or 10 hours a day. The total power produced by one HI-Power turgo hydropower turbine is 3,600-kilowatt hours per year.

4kW turbine * 90 days *10 hours = 3,600-kilowatt hours per year

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

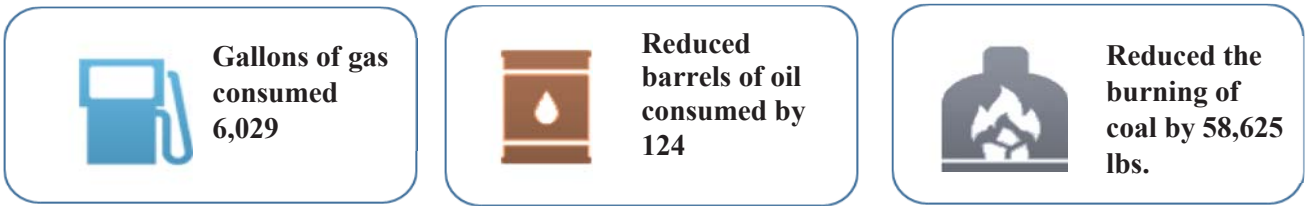
- *Any expected reduction in the use of energy currently supplied through a Reclamation project*

Electricity along the Wasatch Front comes from a variety of sources. One of those sources is the hydropower at Rockport Reservoir which is a Reclamation project. It is unlikely that this project will have any impact on hydropower generation from the Reclamation projects in the area.

- *Anticipated benefits to other sectors/entities.*

Although this is a small amount of power in the overall scheme of things, the electricity generated will allow the Company to more self-reliant and put less demand on the Rocky Mountain Power system. The old saying "every little bit helps" is right in this case, because of the number of small hydro turbines that have been added to DWCCC's system over the past 2 years. The produced energy from all of the DWCCC small hydro's that have or will be installed by June 2018 add up to over 42,300 kW hours of renewable energy each year and offset the use of 69,402 lbs of CO2 per year.

It is estimated that the proposed small turgo hydro project will offset an additional 5,907 lbs of CO2 per year. Over a twenty-year-span when compared with energy produced from a coal power plant this project will help reduce DWCCC's carbon footprint by an additional 118,132 lbs of CO2. This will help in a small way to reduce the need to use more fossil fuels to meet the demands of the Wasatch Front. This is a reduction to DWCCC's carbon footprint that is equivalent to:



- *Expected water needs, if any, of the system*

The small hydro generator will be placed on the line that is used to fill the pump station reservoir and will be operated by the water that flows into the reservoir. No additional water will be needed to operate the generator, and the generator will not use any water.

E.1.4. Evaluation Criterion D – Complementing On-Farm Irrigation Improvements

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

- *Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.*
  - *Provide a detailed description of the on-farm efficiency improvements.*

Farmers served by DWCCC can install pipes, sprinklers, and pivots to make their irrigation systems more efficient and will also allow for higher crop yields and less flooding potential in residential neighborhoods that are continually encroaching on the agricultural lands.

DWCCC provides water to approximately 60 different ditches and turnouts. This project will be a positive move toward ensuring that shareholders will receive their full shares of water through a canal system.

The Company is aware of a few local farm projects that are being considered, most of which are ditch expansions, piping of ditches, and conversion of water deliveries from flood irrigation to sprinklers. The following is a list of those who have interest in on-farm efficiency projects. See Attachment E – On-Farm Signature Page.

Landowner Name	Area	Location
Mike Kolendrianos	66 Acres	West Layton
The Nature Conservancy	500 Acres	West Layton
Robert Family Farms	78 Acres	West Layton
Day Farms	200 Acres	West Layton

  - *Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?*

The four previously listed farm projects have expressed strong interest in participating in NRCS funding programs to accomplish similar goals contained in this application. These projects will allow for better safety and conservation. They have not requested assistance yet from NRCS they plan to in the future.

  - *If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.*

The on-farm assistance has not been requested from NRCS. They have a strong interest to meet with NRCS to develop high-efficiency irrigation systems.

  - *Applicants should provide letters of intent from farmers/ ranchers in the affected project areas.*

The farmers have signed a signature page that can be found in Attachment E – On-Farm Signature Page. This form indicates the name, signature, and acreage of those irrigators benefiting from the project who are interested in applying for NRCS assistance.

- *Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.*
    - *Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how? For example, installation of a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip-irrigation.*

      OR
    - *Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?*

      Yes, the proposed project will complement the on-farm project in the following ways:
      - Less tail water wasting from flood irrigation
      - Better metering and monitoring of system
      - Innovation for better technologies such as sprinkler and drip irrigation methods
- *Describe the on-farm water conservation or water use efficiency benefits that would result from the 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.*

      Farmers served by DWCCC can install pipes, sprinklers, and pivots to make their irrigation systems more efficient.

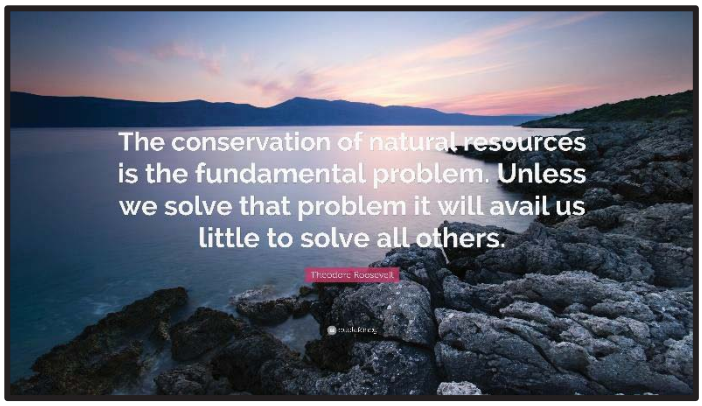
E.1.5. Evaluation Criterion E – Department of the Interior Priorities

Address those priorities that are applicable to your project. Points will be allocated based on the degree to which the project supports one or more of the priorities listed, and whether the connection to the Priority(ies) is well supported in the proposal.

1. *Creating a conservation stewardship legacy second only to Teddy Roosevelt*

   Teddy Roosevelt said, "The conservation of natural resources is the fundamental problem. Unless we solve that problem, it will avail us little to solve all others." DWCCC's proposed project will contribute to solving this "fundamental problem" by metering residential lawn and garden users which will educate users to keep them from overwatering and conserve an estimated 155 acre-feet of water.

Concern over water conservation is most prevalent in the western United States, and especially in Utah – the second driest state in the nation. Because of drought, water conservation in Utah is something that is taken seriously by water distributors and users throughout the state. Although DWCCC can do nothing to stop drought, the Company actively seeks ways to reduce the disastrous effects of drought on the state, and by extension, their water users. By metering and educating users to use the correct amount of water, DWCCC is protecting Utah's water resources and ensuring that these resources are made available to sustain those living within their service area.



2. *Utilizing our natural resources*

The proposed project will contribute to ensuring American Energy is available to meet our security and economic needs by installing a 4kW HI-Power turgo turbine. The small hydro generator will be placed in an existing pump station and will be operated by the water that flows into the reservoir at the pump station. No additional water will be needed to operate the generator.

DWCCC's small hydropower generation sites have shown to provide a good source of renewable energy to help offset the 464,366 kWh of electricity that the Company uses annually. Although this is a small amount of power overall, the generated power will allow the Company to be more self-reliant and put less demand on the Rocky Mountain Power system. The produced energy from all of the DWCCC small hydro units that have or will be installed by June 2018 add up to over 42,300 kW hours of renewable energy.

3. *Restoring trust with local communities*

Many of the local communities and secondary water users are irritated by the overuse from their neighbors. Without understanding the amount or water that is being used, it is difficult to resolve the issues. This project will educate and validate many complaints about watering and may even help those who complain understand that they may also be overwatering.

4. *Modernizing our infrastructure*

Within the few last years, secondary metering water became a viable option. Until that time meters were having issues with the untreated water that flows in a secondary water system. These meters would fail, plug, and give inaccurate results. With the recent development of ultrasonic meters for secondary systems, reliable meters can now be installed to track, monitor, and educate homeowners on water usage.

E.1.6. Evaluation Criterion F – Implementation and Results

E.1.6.1. Subcriterion No. F.1 – Project Planning

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Please self-certify, or provide copies of these plans where appropriate to verify that such a plan is in place.

Yes. A Capital Facilities Plan (CFP) and Model similar to a SOR was completed by DWCCC in 2018 for their secondary system. The CFP has been approved by the DWCCC Board of Directors. See Attachment F – CFP Project Priorities for a list of DWCCC's priority projects on their secondary system.

The DWCCC also has a Water Conservation Plan in place. This plan was updated in 2017 and submitted to the Utah Division of Water Resources for approval. (Copies of both of these plans can be made available upon request).

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, or other planning efforts done to determine the priority of this project in relation to other potential projects.*

   DWCCC completed a Capital Facilities Plan CFP similar to a SOR for their secondary water system in 2018. A copy of the project priorities are included in Attachment F. The CFP planning process allowed DWCCC to evaluate the secondary system as a whole and give them direction on priority projects that can allow for the highest impacts to their system. DWCCC is installing meters on all new connections and is actively working on installing meters on their 8,644 unmetered connections. See page 9 of Attachment F – CFP Project Priorities.

   The Weber River Waters Users' Association developed a "Water Management and Conservation Plan" in 2009 with a Reclamation grant, addressing the needs for the Weber River Basin. In Chapter 4 of the Weber River Basin Plan of 2009, it indicates several conservation goals that they would like to implement, most of which this project will help satisfy. The specific goal that this project will help achieve is to reduce outdoor use through monitoring and more efficient application and delivery of the water.

   DWCCC has a Conservation Plan that includes aspects of this project. They also have Emergency Action and Response Plans, and an Operation and Management Plan, which provides for 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).*

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."*

E.1.6.2. Subcriterion No. F.2 – 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 or better managed, energy generated or saved). For more information calculating performance measure, see Appendix A: Benefit Quantification and Performance Measure Guidance.

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 hydropower turbine will be metered. The metered output will be recorded monthly and compared to the estimation of power generation in this application. This information will be provided in an annual report to the DWCCC Board of Directors.

Water Savings and/or Better Water Management Performance Measures

All water entering the secondary water system is metered. DWCCC has meter records for 8 years of 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 155 acre-feet of water savings shown in this application.

E.1.7. Evaluation Criterion G – Nexus to Reclamation Project Activities

Is the proposed project connected to Reclamation project activities? If so, how? Please consider the following:

Weber Basin Water Conservancy District is a significant 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.

- *Does the applicant receive Reclamation project water?*

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

- *Is the project on Reclamation project lands or involving Reclamation facilities?*
  No.
- *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.
- *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 up in Echo and East Canyon Reservoirs contributing to the storage and potential flow of the Weber River.

Will the project benefit any tribe(s)?
No.

E.1.8. Evaluation Criterion H – Additional Non-Federal Funding

State the percentage of non-federal funding provided using the following calculation: Non-Federal Funding divided by Total Project Cost.

$$\frac{\$450{,}000.00 \text{ Non-Federal Funding}}{\$750{,}000.00 \text{ Total Project Cost}} = \mathbf{60\%}$$

Percentage of Non-Federal and Federal Funding Sources

FUNDING SOURCES	*% of Total Project Cost*	*Total Cost by Source*
Recipient Funding	60%	$450,000
Reclamation Funding	40%	$300,000
Other Federal Funding	0%	$0.00
Totals	100%	$750,000

Project Budget

Funding Plan and Letters of Commitment

Describe how the non-Federal share of project costs will be obtained.

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 and operation funds for their contribution.

Describe any donations or in-kind costs incurred before the anticipated Project start date that you seek to include as project costs.

N/A

Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards the required cost share unless otherwise allowed by statute.

All cost sharing will come from the Davis and Weber Counties Canal Company Secondary System Construction Reserve Account.

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.

Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	***AMOUNT***
Non-Federal Entities	
Recipient Funding	$450,000
Non-Federal Subtotal	$450,000
Other Federal Entities	
Other Federal Subtotal	0.00
Requested Reclamation Funding	**$300,000**
Total Project Funding	**$750,000**

Budget Proposal

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				**$0.00**
Meter Installation	$440	600	EA	$264,000
Meter Materials	$730	600	EA	$438,000
Hydropower Generation	$10,000	1	EA	$10,000
Design Engineering	$5,000	1	EA	$5,000
Public Involvement/Construction Management	$28,000	1	EA	$28,000
Environmental Review (NEPA)	$4,000	1	EA	$4,000
Other				
Reporting	$125.00	8	HR	$1,000
Total Direct Costs				**$750,000**
Indirect Costs				
Type of rate	Percentage	$base		**$0.00**
Total Estimated Project Costs				**$750,000**

Budget Narrative

Salaries and Wages

No DWCCC Salaries or Wages will be included. 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 necessary.

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 contract unit prices from a similar project bid in December 2015. Items bid match the bid items from these projects.

DWCCC will bid the construction portion of the project to several prequalified construction companies. The contractual costs shown are estimates for each of the components to furnish and install all the equipment. Generally, the low bidder will be selected based on a determination of acceptable qualifications.

Contractual will include design at approximately 0.7 percent and construction observation/public involvement at roughly 4 percent. The Contractor will be hired to perform the installation of the 600 meters and to install the hydropower generation.

Environmental and Regulatory Compliance Costs

All of this project will take place in existing street right-of-ways in front of existing homes. It is assumed that a Categorical Exclusion can be done to satisfy the NEPA requirements. 32 hours at $125 = $4,000 has been included in the project for the Categorical Exclusion.

Other Expenses

None.

Indirect Costs

No indirect cost will be part of the project.

Total Costs

DWCCC Portion: $450,000 Fed Portion: $300,000 Total: $750,000

Environmental and Cultural Resources Compliance

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

Impacts will be those associated with installing meters in front of existing homes. The proposed project improvements will take place entirely within the existing street right-of-ways. In the past, similar projects have had minimal impacts, usually less than 10ft by 10ft per meter. The surface vegetation will be restored upon completion of the project.

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. A previous environmental document for a metering project in this area did not identify any impacts concerning threatened or endangered species.

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

DWCCC is not aware of any impacts to wetlands. A previous environmental document for a metering project in this area did not identify any impacts wetlands and there are no "Waters of the United States" in the project area.

When was the water delivery system constructed?

The secondary water system and services where the meters will be placed were constructed between 1993 and 2014.

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

The meters will be placed on the underground service lines to homes. The meters will be located in the street right-of-ways. These lines are between ¾" and 2" in diameter. The service lines were constructed between 1993 and 2014.

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, structure or feature that would be impacted. A cultural resource inventory will be completed as part of the submitted environmental document. A previous environmental document for a metering project in this area did not identify any impacts to historic structures.

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. A previous environmental document for a metering project in this area did not identify any known archeological sites.

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

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

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

No.

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

No.

Required Permits or Approvals

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 hydropower system. The FERC permit has already been applied for as part of a previous hydropower project at this location.

Letters of Support

Include letters of support from interested stakeholders supporting the proposed project.

Letters of Support from the following are included in Attachment D – Letters of Support:

- Utah Division of Wildlife Resources – Clint Brunson, Aquatics Habitat Restoration Biologist
- Trout Unlimited – Paul Burnett, Weber River Project Coordinator

Official Resolution

Include an official resolution adopted by the applicant's board of directors or governing body. The official resolution may be submitted up to 30 days after the application deadline.

The Official Resolution for the Davis and Weber Counties Canal Company (DWCCC) Secondary Water Metering and Small Hydro Project will be submitted within 30 days after the application deadline.

Davis & Weber Counties Canal Company

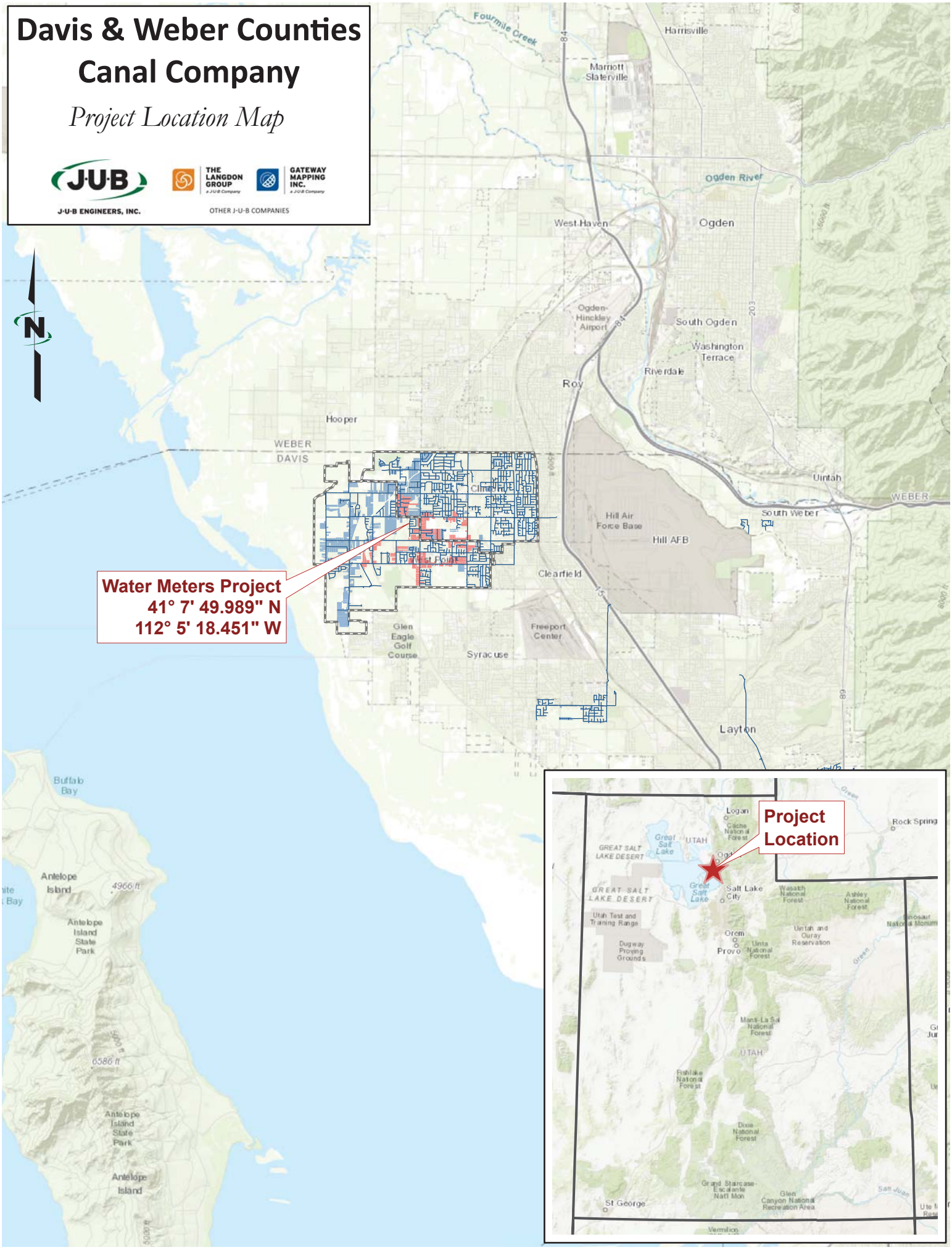
Project Location Map

J-U-B ENGINEERS, INC.

THE LANGDON GROUP a J-U-B Company

GATEWAY MAPPING INC. a J-U-B Company

OTHER J-U-B COMPANIES



Davis & Weber Counties Canal Company

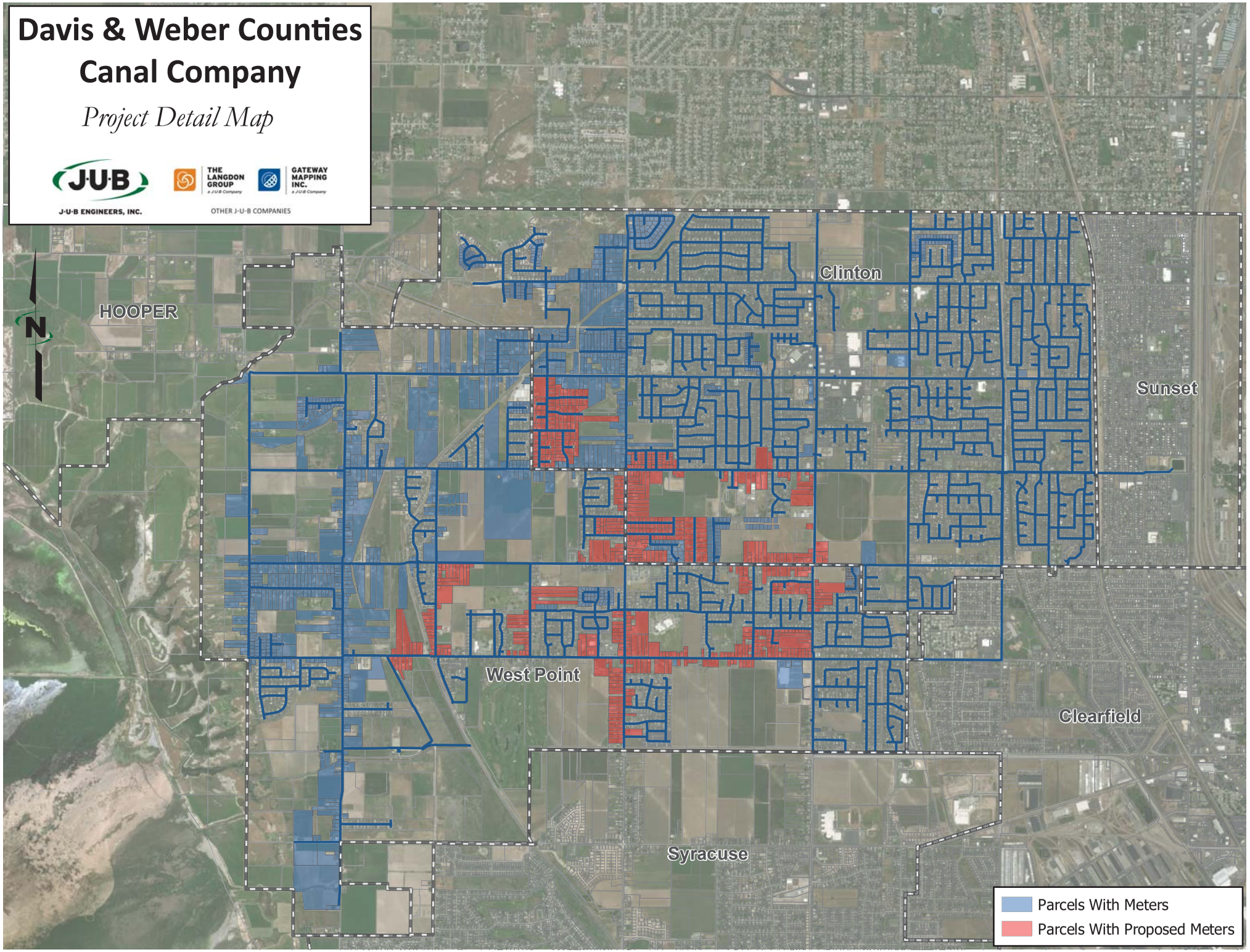
Project Detail Map

J-U-B ENGINEERS, INC.

THE LANGDON GROUP a J-U-B Company

GATEWAY MAPPING INC. a J-U-B Company

OTHER J-U-B COMPANIES



WEBER BASIN WATER CONSERVANCY DISTRICT

Saving Water through Secondary Water Metering

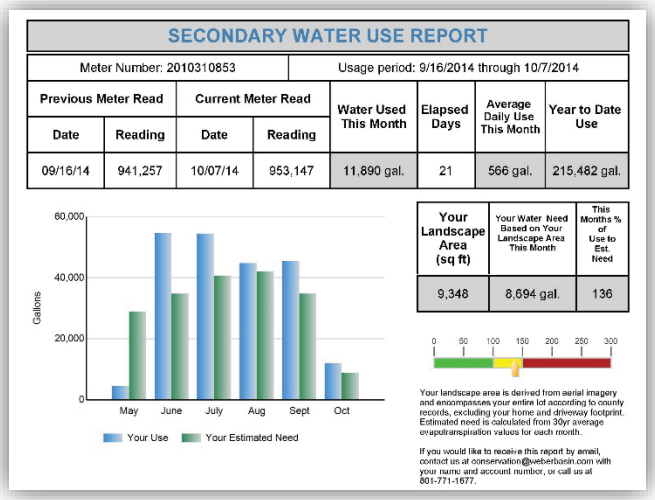
Introduction:

In Northern Utah and primarily within the boundaries of Weber Basin Water Conservancy District's (District) Wasatch Front service area is one of the country's largest contiguous urban pressure irrigation regions. In this area, secondary water is defined as piped, non-potable pressurized water delivered to individual property owners for irrigation of lawns and gardens. Secondary watering systems were originally conceptualized and installed by the U.S. Bureau of Reclamation (USBR) as a cost efficient way of providing irrigation water without the cost of treating water to potable standards. Because adequate technology did not exist at the time, meters were not installed on these connections. The number of secondary connections has increased with population and there are now approximately 102,000 secondary connections within Davis and Weber counties. The users currently pay for their secondary water annually by direct billing or on utility bills.

1" Sensus iPERL Secondary Water Meter (Photo courtesy of Standard-Examiner)

Secondary Metering:

In the past decade, technology advanced to offer flow-through meters, which can accommodate the challenges of residential secondary metering by allowing debris to pass through and by fully draining during the non-irrigation season to prevent freezing and breakage. Since 2009, the District has installed approximately 4,800 meters between existing and new secondary connections. The meters are equipped with endpoints that allow hourly data to be collected using a drive-by reader or a fixed network Advanced Metering Infrastructure (AMI) system that allows continuous data collection.



SECONDARY WATER USE REPORT

Meter Number: 2010310853 — Usage period: 9/16/2014 through 10/7/2014

Previous Meter Read		Current Meter Read		Water Used This Month	Elapsed Days	Average Daily Use This Month	Year to Date Use
Date	Reading	Date	Reading				
09/16/14	941,257	10/07/14	953,147	11,890 gal.	21	566 gal.	215,482 gal.

Your Landscape Area (sq ft)	Your Water Need Based on Your Landscape Area This Month	This Months % of Use to Est. Need
9,348	8,694 gal.	136

Your landscape area is derived from aerial imagery and encompasses your entire lot according to county records, excluding your home and driveway footprint. Estimated need is calculated from 30yr average evapotranspiration values for each month.

If you would like to receive this report by email, contact us at conservation@weberbasin.com with your name and account number, or call us at 801-771-1677.

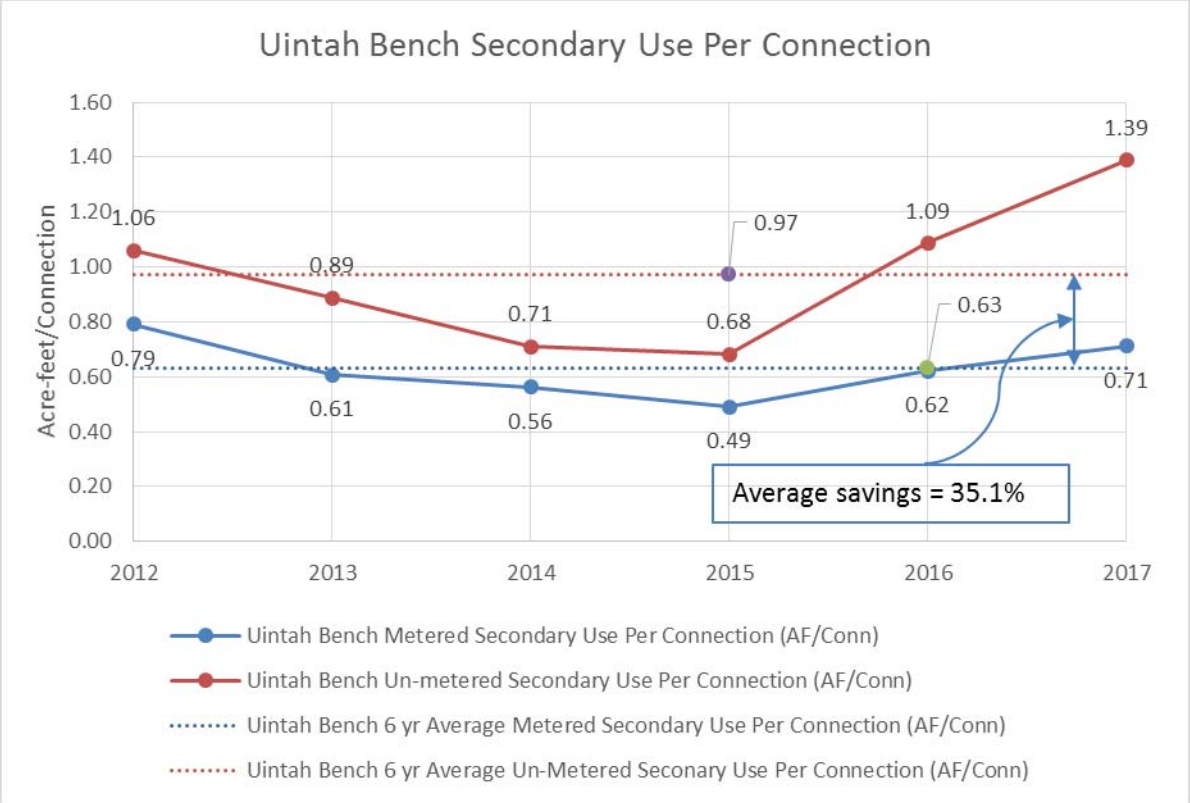
Sample Monthly Secondary Use Statement

The District provides customers with a monthly usage statement detailing their secondary water consumption for the preceding month and compares it to an estimated water need. The estimated water need is customer specific and is based on historical climatic data and the irrigable

area of their lot. Individual lot irrigable areas are quantified by digitizing the existing lawn and landscaping of each parcel from aerial photography.

Water Savings:

In order to quantify water savings, the amount of water used at a secondary connection before a meter is installed must be known. While the exact amount used at a particular residence before meter installation is impossible to know, the District uses secondary water trunk line meters that service large areas to determine average use for un-metered secondary users. Using meter data for the water sources to the Uintah Bench area and then subtracting non-secondary uses and allowing for 5% leakage and evaporation losses within the distribution system, the total secondary water use by un-metered connections is calculated. Chart 1 outlines secondary water use in the District's Uintah Bench secondary service area that provides secondary water to 4,990 secondary connections in Ogden, Washington Terrace, and South Ogden. The red line shows the average un-metered secondary use by year while the blue line shows the actual metered secondary use per connection by year. (Note that an acre-foot is approximately 326,000 gallons or enough water to cover a football field about one foot deep.)



Outdoor water use varies year to year due to variables such as rainfall, temperature and evapotranspiration. Chart 1 shows that on average un-metered secondary connections used 0.97 acre-feet of water per year per connection while those with a meter used 0.63 acre-feet illustrating a savings of 35% over the 6 year period. Of particular note is the difference of use between 2015 and 2017. The irrigation season of 2015 was relatively wet while 2016 and 2017 were hot and dry. From 2015 to 2017, un-metered secondary users increased their use by 104% (from 0.68 acre-feet per connection to 1.39 acre-feet per connection) while metered secondary users increased by only 45% (from 0.49 acre-feet

per connection to 0.71 acre-feet per connection). For 2017 the savings between metered and un-metered users was 49%.

Conclusion:

The District has documented significant water savings due to its secondary metering efforts and views conservation among un-metered secondary water users as one of its greatest opportunities for water resource development. Despite the high costs of retrofitting existing secondary connections with a meter, the District plans to continue installing meters until all of the District's 18,000+ existing retail connections are metered.

The District also plans to make secondary water use data collected by the District's new AMI system available to customers on their computer or smart phone to allow users to access their secondary water use near instantaneously. The District feels like this will empower the user to become a better steward of their secondary water use because they will be able to monitor their use more accurately and almost real-time. It is important to note that within the District boundaries there are at least a dozen secondary water providers with an additional 86,000 secondary connections which are largely unmetered. These companies have shown interest in metering their connections, but the high cost associated with retrofitting meters is difficult to fit into their smaller budgets. Several of these secondary water providers however are requiring meters to be installed on new connections which is a great first step.

Weber Basin Water Conservancy District
Secondary Water Metering Report
December 2017

converting it into a useable format for a statement for each water user and for other types or reports that are desired.

7. Conclusion

In conclusion, the metering of secondary water has many challenges and certainly high costs. The District as a large regional water provider, is charged with providing adequate water supply with ever growing demands. The District knows there is a need for conservation and user accountability. That burden for water accountability should naturally be shared with all water users. The meter and the data gathered from metered connections on water use is the very tool which can bring knowledge to each water user and help them to become more accountable for the water they use. Metering essentially becomes a large scale water supply project, with the potential of reducing water use by 30% or more related to landscape irrigation.

There may need to be policy changes and there will certainly be more education and programming to teach people about efficient and proper use of water in the landscape. In the future there may need to be changes made regarding the cost for secondary water and how that breakdown would be made and how billing for secondary water will be collected. Overall, the metering has been very successful. The data collected is invaluable and will provide the necessary information for the District to make wise policy decisions. Current water supply can be managed more effectively and future water supply projects and the timing of those projects to meet all water demands can be planned and constructed to meet real and projected need in a more efficient and effective manner.

Trout Unlimited
1777 N Kent Street, Suite 100
Arlington, VA 22209
(703) 522-0200

April 19, 2018

Rick Smith, PE
General Manager
Davis and Weber Counties Canal Company
138 W 1300 N
Clearfield, UT 84015

Dear Mr. Smith:

Over the past several years, Trout Unlimited has had the great opportunity and privilege to be involved in a positive effort within the Weber River Watershed, known as the Weber River Partnership. We value the involvement and perspective that the Davis and Weber Counties Canal Company has brought to this partnership, which represents a broad and diverse array of interests within the basin. The Weber River Partnership has made great progress in the Weber River by providing a platform for communication, coordination and collaboration among the diverse stakeholders and we believe this diversity has brought considerable value to developing a cohesive vision that includes water security, agricultural interests, community development and natural resources values.

Trout Unlimited has been working on the ground with a number of partners throughout the Weber River Basin, including the Utah Division of Wildlife Resources, agricultural producers and water users to protect and restore populations of Bonneville cutthroat trout and bluehead sucker though habitat restoration, fish passage and water efficiency projects. The bluehead sucker and Bonneville cutthroat trout populations have declined and are considered to be in jeopardy and petitions for listing under the Endangered Species Act are possible. Understandably, all partners in the watershed benefit by preventing the listing of imperiled species, but beyond that, we believe that many watershed partners also greatly value the fact that these species still persist in the Weber River, a sign of the great resilience of these native species and a reflection of the rich economic vitality they bring to our communities. Nevertheless, these species need our help and a cohesive strategy through the Weber River Partnership broadens the scope of our actions on the ground to provide broad benefits to all stakeholders in the Basin.

Trout Unlimited is encouraged by and supportive of your proposed project to improve the water conveyance efficiency of and metering within your system under the WaterSMART water and energy efficiency program. We are encouraged by your consideration of leaving a portion of the saved non-consumptive water in-stream, as water demands at certain times of the year can leave lows in the Weber River at critically low levels, a condition that continues

to be the one of the most existential threats faced by native fish in the Weber River. We support your proposal and are committed to working with the Davis and Weber Counties Canal Company on this efficiency project if our assistance is needed. We look forward to the continued collective progress, working in partnership with your organization on the broader goals of improving communication, coordination and collaboration within the Weber River Basin.

With Kind Regards.

Paul Burnett - Utah Water and Habitat Program Lead
5279 South 150 East
Ogden, UT 84405
801-436-4062
pburnett@tu.org

GARY R. HERBERT
Governor
SPENCER J. COX
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Wildlife Resources
MICHAL D. FOWLKS
Division Director

April 24, 2018

Richard D. Smith, P.E.
General Manager
Davis &Weber Counties Canal Company
138 West 1300 North
Sunset, Utah 84025

Subject: U.S. Bureau of Reclamation WaterSMART Water Efficiency Grant

Dear Mr. Smith:

As the Aquatics Habitat Restoration Biologist in Northern Utah for the Utah Division of Wildlife Resources (UDWR), I am pleased to write in support of the grant application you are submitting to the U.S. Bureau of Reclamation Water and Energy Efficiency Grants Program. I applaud your efforts to increase the efficiency of your system to conserve valuable water and energy. All water savings in the Weber River are valuable to ensure that we have adequate water for future generations.

The Bonneville Cutthroat Trout and Bluehead Sucker are native fish species found in portions of the Weber River. Both species are covered by conservation agreements the State of Utah has entered into with the U.S. Fish and Wildlife Service and other parties. The population status of these two sensitive species warrants additional conservation effort to diminish the likelihood of future listings under the Endangered Species Act. UDWR's approach to aquatic species conservation and management in the Weber River, in part, focuses on reconnecting and maintaining connectivity of priority habitats by removing unnecessary barriers to fish migration, or by modifying existing barriers to allow upstream movement of these species, particularly for Bonneville Cutthroat Trout and Bluehead Sucker. Naturally of course, stable and connecting flows between those habitats are a fundamental requirement for those conservation actions to be successful. Within that context, most any project that enhances the continuity and maintenance of flows within the Weber River is a step in the right direction, as we work cooperatively to protect and conserve these native species.

The Weber Basin Water Conservancy District has been a great partner and contributed to a graduate student project that is currently studying Bluehead sucker in the Weber River. The outcome from this study will be to determine important spawning locations (including spawning habitat requirements) and the type of low velocity/backwater habitats needed for juvenile Bluehead sucker survival and recruitment. The results from this study will guide future management of Bluehead sucker in the Weber River into the future and will help guide future habitat restoration projects.

1594 West North Temple, Suite 2110, PO Box 146301, Salt Lake City, UT 84114-6301
telephone (801) 538-4700 • facsimile (801) 538-4709 • TTY (801) 538-7458 • *www.wildlife.utah.gov*

UTAH DNR WILDLIFE RESOURCES

The population of Bonneville Cutthroat Trout in the lower Weber River is quite unique in that they travel significant distances in the main stem Weber River and ultimately up into tributary streams to spawn. This life history attribute has been lost from almost all Bonneville Cutthroat Trout populations, but still persists in the Weber River! We are very excited regarding the objective in this grant application that specifically addresses two specific lengths of canal needing repair. Water saved by piping both reaches of canal will benefit both Bonneville Cutthroat Trout and Bluehead sucker in the lower stretches of the Weber River. Both the UDWR and TU are fully committed to partner with the Davis and Weber Counties Canal Co. to ensure that the work on these two sections of canal is completed, thus allowing more water for fish use in the lower Weber River. This project will help ensure that Bonneville cutthroat trout and Bluehead sucker do not become a federally listed species under the Endangered Species Act in the future.

Sincerely

Clint Brunson
Aquatics Habitat Restoration Biologist
Utah Division of Wildlife Resources

Davis and Weber Counties Canal Company (DWCCC)
On-farm Intent Signatures - Small Piping and Hydro Project
FOA# BOR-DO-18-F006

Landowner Name	Claimable Acreage	Landowner Signature I have an interest to install a high-efficiency irrigation system when sufficient water quantity, quality, and application requirements are met.
Mike Kotendrianos	66	Mike Kotendrianos
The Nature Conservancy	500	Mike Kotendrianos
Roberts Family Farms	78	Dix B. Roberts
Day Farms	200	Thomas Day

The assumption has been made that future demand characteristics will be similar to current patterns for similar land uses. The existing level of service will be the same level of service for the future for the water sources, storage and distribution system.

3-2 Future Water Distribution System

Areas of future development have been modeled based on projected demands and assumed pipe locations. It is anticipated that 8-inch waterlines will be installed to serve future developments unless otherwise noted. A summary of the model results using the level of service based on peak hour demands of 40 psi is included in Appendix B. The Table in Appendix B compares the pressure for a particular node at the existing and future buildout, peak hour demands. See Figure 3-2 in Appendix A that shows the peak hour system pressure for the proposed secondary water system at buildout.

4 - SYSTEM MODIFICATIONS

Future system modifications are defined as those improvements required to maintain desired levels of service at build-out and to adjust for growth that may have varied from initial assumptions. The difficulty lies in determining the timing of needed improvements. Typically, the improvements are needed some time prior to build-out.

Clinton City and West Point City have experienced growth since 2000, but there are still sections of undeveloped land in both cities. The construction sequence of the future capital improvements will depend upon where development occurs. Development trends and rates will have an impact on where improvements are needed and when.

5 – CAPITAL FACILITIES PROJECTS

As described in section 2.2.3, the area between 1000 W to 1500 W and 550 N to 2300 N experiences low pressures during peak hour demands. This is due to the elevation relative to the Sunset Reservoir. The static (no demand on the system) pressure at the intersection of 1300 N and 1000 W is approximately 49 psi. The existing peak hour pressures calculated in the model, show pressures at the same intersection as low as approximately 28 psi. The lowest existing peak pressure in the model is approximately 20 psi at 800 N and 1000 W in Clinton. A table of the complete model outputs for existing and future demands is provided in Appendix B.

The following are the proposed projects:

Project 1 – Combine the service area of the 1000 W booster station with the 500 W pump station as shown in Figure 2-1. The 500 W pump station currently has the capacity to handle the additional flows with all 4 of the installed pumps pumping simultaneously. In order to

connect the two pressure zones, approximately 360 feet of 12" pipe is needed along 1300 North. The existing 1000 W booster pump will be decommissioned. This project is planned to be complete in the spring of 2018.

Project 2 – Upsize the capacity of the 500 West pump station. When Project 1 is completed, the 500 West pump station will be close to, if not already, operating at maximum capacity. In an effort to provide redundancy in the pump house, we are proposing upsizing one of the existing pumps. This will increase the capacity of the pump station to account for the increased flows from combining pump stations.

Project 3 – Install a 42" parallel transmission line from the Sunset Reservoir to 1000 W. This parallel transmission line will allow DWCCC to increase the amount of flow that is supplied into the system by gravity. This will decrease the amount of flow needed to be pumped at either the 200 S West Point Reservoir or the proposed 1300 N Hopfenbeck Reservoir. This transmission line will also add redundancy to the system.

Project 4 - Upsize the pipe in West Point along 300 N from Cold Springs Road to 4000 W to a 24" pipe. This pipe is needed to expand the influence of the 200 South West Point Reservoir. It will allow more pumps to be turned on at the West Point pump station, which will decrease the peak flow that occurs in the transmission line from the Sunset reservoir.

Project 5 - Build the currently masterplanned 1300 N Hopfenbeck Reservoir located at 1300 N and 4400 W in West Point. This reservoir is needed to provide service to the western area of the system. This project will further decrease the demand on the Sunset Reservoir.

Project 6 – Upsize the transmission line for the 1300 N Hopfenbeck Reservoir to serve the heart of the secondary water system. The transmission line needs to be upsized along 1300 N from 4000 W to 3000 W. This project consists of 475 feet of 30" pipe, 2,650 feet of 24" pipe, and 2,670 feet of 18" pipe. This project will then form a larger connected transmission line from the Sunset reservoir to the 1300 N Hopfenbeck Reservoir.

Project 7 – Upsize the distribution pipe west and north of the 1300 N Hopfenbeck Reservoir to serve the north west area of the system. The transmission line needs to be upsized along 4500 W from 1300 N to 2200 N. This project consists of 1,105 feet of 18" pipe, and 5,570 feet of 12" pipe.

Installing meters on all services was discussed as a possible solution to decrease demands on the system, which would increase system pressures and possibly reduce the magnitude of the proposed projects. The magnitude of the reduction in peak hour demands by installing meters is unknown. There are approximately 8,644 unmetered connections in the Clinton/West Point system. The total cost for installing water meters for the entire system is approximately $12,966,000. A cost estimate for this concept is included in Appendix C.

6 – PRIORITIZED IMPROVEMENTS COSTS AND SCHEDULE

6-1 Summary of Costs

Detailed cost estimates for the above improvements are included in Appendix C. All cost estimates are calculated based on 2017 dollars. Locations of these projects are shown on Figure 3-1 in Appendix A.

A tentative prioritization of projects is summarized based upon expected growth patterns in Table 6-1.

Table 6-1: Capital Facilities Projects Prioritization

1	Project 1: Connect 1000 W booster zone to 1300 N booster zone (2018)	$41,000
2	Project 2: 500 W pump station additional pump	$48,000
3	Project 3: 42” 1300 N parallel transmission line from Sunset reservoir	$2,296,900
4	Project 4: 24” Pipe along 300 N from Cold Springs Road to 4000 W	$386,000
5	Project 5: 1300 N Hopfenbeck reservoir and pump station	$4,160,500
6	Project 6: 24” and 18” along 1300 N from 4100 W to 3000 W	$1,142,200
7	Project 7: 18” and 12” along 4500 W from 1300 N to 2200 N	$962,600
	TOTAL – PROJECTS TO ADDRESS FUTURE DEFICIENCIES	$9,037,200

These summaries of cost represent approximate costs in 2017 dollars and are a budgetary level estimate. These costs do not represent all improvements or additions that will be made to the system. There will be many other facilities that will be installed as part of future development. The costs identified above are only for those improvements needed to meet minimum desired standards, or levels of service, at build-out. Other installed facilities will consist of lines to provide service to specific parcels or developments.

6-2 Improvement Schedule

Table 6-2 includes a schedule of all of the project improvements noted in the capital facilities plan project list.