WaterSMART

Water and Energy Efficiency Grants for FY 2016

Funding Opportunity Announcement No. R16-FOA-DO-004

Funding Group II

Woodruff Hydroelectric Project

Woodruff, Utah

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January 20, 2016

Table of Contents

Technical Proposal and Evaluation Criteria

Executive Summary

The executive summary should include:

- *The date, applicant name, city, county, and state*
- *A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of this FOA*
- *State the length of time and estimated completion date for the project*
- *Whether or not the project is located on a Federal facility*

Date: January 20, 2016

Applicant: Woodruff Irrigating Company
Woodruff, Cache County, Utah

Project Title: Woodruff Hydroelectric Project

Project Summary:

The Woodruff Irrigating Company provides irrigation water to approximately 6,200 acres of agricultural land with approximately 1,550 acres located in the upper system and 4,650 acres located in the lower system. The company owns and operates Woodruff Creek Reservoir with a capacity of about 4,350 acre-feet of water. Water is released from the reservoir into Woodruff Creek and is conveyed approximately four miles downstream to be distributed to the Woodruff irrigating canals. The proposed project involves the design, construction, and implementation of a pipeline from Woodruff Creek Reservoir to the confluence of Woodruff Creek and Birch Creek, and the construction of a hydropower facility to take advantage of the energy that will need to be dissipated. The project will:

- Conserve nearly 1,700 acre-feet of water annually
- Provide shareholders with a more reliable and sustainable system
- Alleviate yearly summer droughts
- Produce a clean, renewable energy source
- Improve water quality in a river that is listed as a 303(d) impaired water body

Approximate Length: 22 Months

Completion Date: June 2018

Federal Facility: The project is not located on a Federal facility.

Background Data

Project Location

Provide a map of the area showing the geographic location (include the State, county, and direction from the nearest town).

The project is located in and around Woodruff Town, Rich County, Utah. See Figure 1.

Applicant's Water Supply

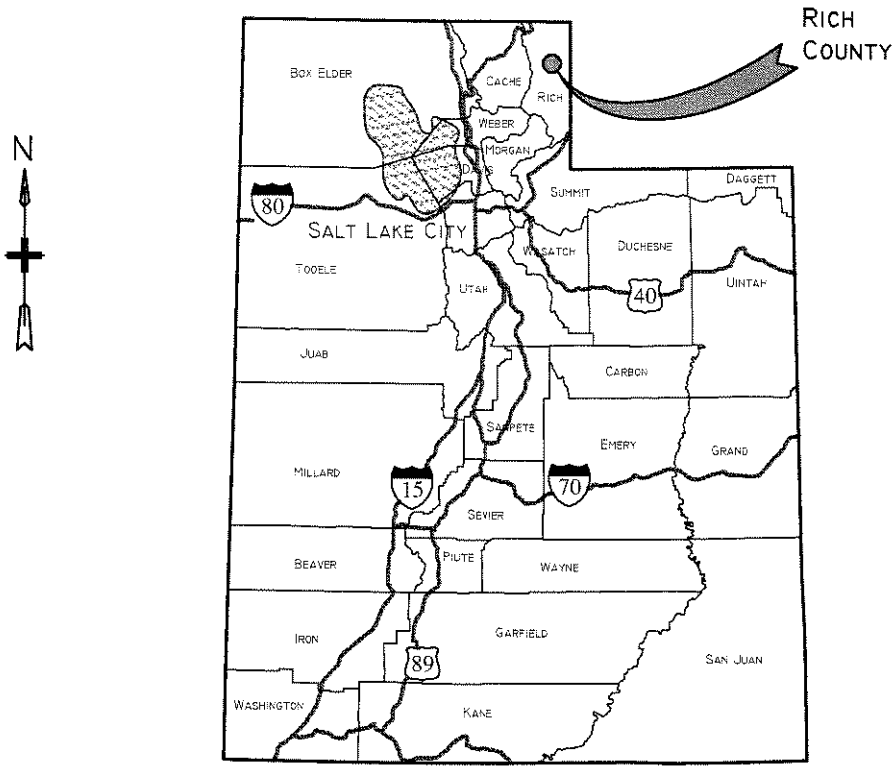
As applicable, describe the source of water supply, the water rights involved, current water uses (e.g., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in water supply. If water is primarily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

Woodruff Irrigating Company is a nonprofit irrigation company that was established in the late 1800's to provide water to agricultural users near the town of Woodruff, Utah. Water sources include Woodruff Creek and Birch Creek. The company's service area covers a total of 6,200 acres, which is divided into an upper system of 1,550 acres and a lower system of 4,650 acres (see Figure 2). There are approximately 50 producers irrigating about 3,100 acres of alfalfa/oats which are mostly sprinkler-irrigated by pumping water as well as about 2,300 acres of native grasses/wild hay (grass-hay) and 800 acres of pasture, which are all flood irrigated. On average, the total water available is 14,400 acre-feet annually.

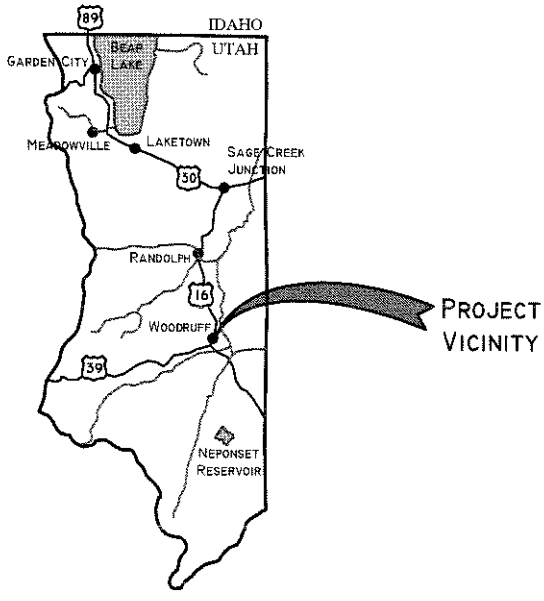
The proposed project would eliminate losses in the conveyance system and provide a large source of hydropower that could be sold to provide a source of income for the company. This would also create a more sustainable and reliable water supply.

The irrigation company was awarded a storage water right for an additional 5,400 acre-feet from the Bear River Compact in 1982. Due to lack of funds, the company has not been able to use this water right. Completing the proposed project would improve funding opportunities from other agencies to complete a larger project involving the rehabilitation of Woodruff Dam and raising the dam to store the additional 5,400 acre-feet of water. Storing this additional water would allow water to be held from spring run-off for late summer irrigation, create a very sustainable water supply even in years of drought, and provide for additional hydropower potential. A study performed by the Utah Division of Water Resources estimated that crop production would increase 100%, and late summer and fall feed was estimated to increase 100 to 130%, if the system was pressurized and the dam enlarged to store the additional water.

A summary of Woodruff Irrigating Company's water rights can be found in Appendix D.



State of Utah



Rich County Map

FRANSON CIVIL ENGINEERS	DATE: JANUARY 13, 2016 SCALE: NO SCALE Fig 1 - Location.dwg \\Franson\Projects\UT\Wasatch Back\Woodruff IC General Services\Drawings LAYOUT: Fig 1-Loc Maps	WOODRUFF IRRIGATING COMPANY WOODRUFF HYDROELECTRIC PROJECT	FIGURE 1 PROJECT LOCATION MAPS

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.

The company owns and operates two reservoirs; Woodruff Creek Reservoir with an existing capacity of 4,350 acre-feet and Birch Creek Reservoir with a capacity of 2,250 acre-feet. Water from these reservoirs is released to Woodruff Creek and Birch Creek, respectively. Water is then diverted into several irrigation canals and delivered to approximately 64 shareholders. Currently there are about 40 miles of open canals. The irrigation company is in the process of the converting the lower system into a pressurized irrigation system. The new lower system will replace about 20 miles of open canal with 9 miles of pipe. The entire system, including the new pressurized system, is shown in Figure 2. The irrigation company maintains good records of water diverted into each of the canals. Board members from the irrigation company estimate that 15% of the water is lost to seepage and evaporation from Woodruff Creek Reservoir to the confluence of Birch Creek and Woodruff Creek.

Renewable Energy or Energy Efficiency

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

The shareholders using sprinklers to irrigate are currently pumping water from the canals. Some shareholders also pump from private wells. The lower system is currently in design/construction of a pressurized irrigation system that is anticipated to save energy by eliminating pumping costs.

Prior Work 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).

Woodruff Irrigating Company received a WaterSMART grant in June 2015 to fund the Woodruff Pressurized Irrigation Project. The grant money being used involves the design, construction, and implementation of a pressurized irrigation system in the lower system (See Figure 2). Construction is anticipated to begin in the summer of 2016.

Technical Project Description

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

If a grant from Reclamation is awarded, the irrigation company will secure a loan from the Utah Division of Water Resources to complete the project. Once funding is secured, an engineering design report will be prepared to finalize the best alignment options, pipe sizes, location and size of hydropower units, and complete all required permits. Then, an environmental and cultural review will be done by a registered environmental firm. Once environmental clearance is obtained, the engineering design and construction documents will be prepared. It is anticipated that all permitting, environmental clearances, and engineering design would be completed by the spring of 2017 and construction of proposed facilities would occur in the summer/fall of 2017-2018 with an estimated completion by June 2018.

A preliminary analysis has been completed to evaluate potential pipe alignments and sizing. The proposed project will replace the existing conveyance of water through the Woodruff Creek Canyon with a pressurized pipeline as shown in Figure 3. Approximately 4 miles of river conveyance will be replaced with 4 miles of pipe. It is anticipated that nearly 1,700 acre-feet of water will be conserved annually. All materials used will be from well-known manufacturers and meet general Natural Resources Conservation Service (NRCS) irrigation standards.

High density polyethylene (HDPE) or steel pipe will be used for the pipeline. The preliminary pipe size is 54-inch HDPE or 48-inch inner diameter steel pipe. The pipeline will have a capacity of 65 cfs.

The pipeline will be designed not to exceed the industry accepted standard of a water velocity of 5 feet per second. A hydraulic model will be prepared based on the determined design flows to evaluate potential surges and to verify sizing and pressure requirements. Air-valves, control valves, drains, fittings, and relief valves will be installed at appropriate locations to ensure the proper operation of the pipeline.

Constructing a pipeline from Woodruff Creek Reservoir to the confluence of Birch Creek and Woodruff Creek and constructing a hydropower plant will be a large source of renewable energy. Preliminary estimates show the turbines will have a capacity of 1.0 megawatts (MW). This could result in nearly 2,160,000 kilowatt-hours (kWh) of energy generated per year.

The complete design of the pipeline will be done by a professional engineering firm to ensure that the system meets minimum standards of quality. All design drawings will be stamped by a professional engineer and be available to Reclamation for review if requested.

Evaluation Criteria

Evaluation Criterion A: Water Conservation

Up to 28 points may be awarded for a proposal that will conserve water and improve efficiency. Points will be allocated to give consideration to projects that are expected to result in significant water savings.

Subcriterion No. A.1 – Quantifiable Water Savings

Up to 24 points may be allocated based on the quantifiable water savings expected as a result of the project.

Describe the amount of water saved. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.*

In addition, all applicants should be sure to address the following:

- *What is the applicant's average annual acre-feet of water supply?*
- *Where is that water currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*
- *Where will the conserved water go?*

Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.

With completion of the Woodruff Pressurized Irrigation Project, Woodruff Creek Reservoir is anticipated to release about 11,600 acre-feet of water each year. The conveyance system through the canyon is Woodruff Creek, which is estimated to lose approximately 15% of the conveyed water to seepage and evaporation. This was estimated by the river commissioner through many years of experience.

The total water conserved is estimated to be 1,700 acre-feet annually as shown in Table 1. This equates to about 15% of water loss through Woodruff Creek Canyon.

Table 1: Water Conserved

Description	Amount
Total water diverted from Woodruff Creek Reservoir =	11,600 acre-feet
Estimated losses in conveyance (15%) =	1,700 acre-feet

The conserved water will allow for a more sustainable supply of water and also leave water in the stream which benefits the Bear River System, downstream users, and the Bear River Migratory Bird Refuge.

Please address the following questions according to the type of project you propose for funding.

(1) ***Canal Lining/Piping:*** *Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:*

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

As stated above, the conveyance system through the Woodruff Creek Canyon is estimated to lose approximately 15% of the conveyed water to seepage and evaporation. This was estimated by the river commissioner through many years of experience. The total average annual water savings from canal seepage is 1,700 acre-feet.

(b) How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.

The river commissioner indicated that when he releases water from the reservoir, he has to release more to ensure the required flows were reached downstream. The river commissioner has been doing this for 20 years and it is his estimate of 15% that is being used.

(c) What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?

Seepage losses will be completely eliminated. The canals will be replaced with HDPE or steel pipe. With good construction practices, the losses will be near zero.

(d) What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

Approximately 4 miles of conveyance through the creek will be replaced with 4 miles of pipe for a total water conservation of nearly 1,700 acre-feet annually. Therefore, about 425 acre-feet will be conserved per mile of pipe installed.

(e) How will actual canal loss seepage reductions be verified?

The releases from the reservoir will be compared to historical releases and the reduced flows will verify the reductions.

(f) Include a detailed description of the materials being used.

As stated in the Technical Description, HDPE or steel pipe will be used for enclosing the canals, which is commonly used for irrigation systems. The preliminary pipe size is 54-inch HDPE or 48-inch steel. Other materials for the pipeline include isolation valves, air-vacuum valves, and water measuring devices. Materials for the hydropower facility include piping, valves, turbines, and electricity for cooling, heating, and lighting.

Subcriterion No. A.2 – Percentage of Total Supply

Up to 4 additional points may be allocated based on the percentage of the applicant's total average water supply (i.e., including all facilities managed by the applicant) that will be conserved directly as a result of the project.

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

$$\frac{\textit{Estimated Amount of Water Conserved}}{\textit{Average Annual Water Supply}} = \frac{1{,}700 \text{ acre-feet}}{14{,}400 \text{ acre-feet}} = 12\%$$

Evaluation Criterion B: Energy-Water Nexus

Up to 16 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency.

For projects that include construction or installation of renewable energy components, please respond to Subcriterion No. B.1. If the project does not implement a renewable energy project but will increase energy efficiency, please respond to Subcriterion No. B.2. If the project has separate components that will result in both implementing a renewable energy project and increasing energy efficiency, an applicant may respond to both.

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

Up to 16 points may be awarded for projects that include construction or installation of renewable energy components (e.g., hydroelectric units, solar-electric facilities, wind energy systems, or facilities that otherwise enable the use of renewable energy). Projects such as small-scale solar resulting in minimal energy savings or production will be considered under Subcriterion No. B.2 below.

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

It is anticipated that a hydropower unit will be installed along the pipeline at a location where the most power can be generated and where the site can easily be connected to the local power grid

(see Figure 3). The capacity for the unit is shown in the table below. The hydroelectric capacity was calculated assuming a turbine and generator efficiency of 70%.

Table 2: Hydroelectric Capacity

Hydroelectric Unit	Available Dynamic Head (ft)	Available Flow (cfs)	Hydroelectric Capacity (MW)
Unit 1	249	65	1.0

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

Ninety days is assumed to be the number of days that flow will be released from the reservoir and power will be generated. The total energy generated is 2,160,000 kWh per year.

Unit 1 - 90 days x 24 hours/day x 1,000 kW = 2,160,000 kWh

Total = 2,160,000 kWh/year

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

- *Expected environmental benefits of the renewable energy system*
- *Any expected reduction in the use of energy currently supplied through a Reclamation project*
- *Anticipated beneficiaries, other than the applicant, of the renewable energy system*
- *Expected water needs of the renewable energy system*

By producing renewable energy and providing renewable energy to all potential power company users, the irrigation company will receive power sale revenue to help offset costs of operating and maintaining the system. In addition, it is anticipated the costs associated with pumping existing wells will decrease. No additional water needs will be required to operate the system as power will be generated on existing flows.

Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management

If the project is not implementing a renewable energy component, as described in Subcriterion No. B.1 above, up to 4 points may be awarded for projects that address energy demands by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.

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

- *Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*
- *Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?*
- *Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.*
- *Does the calculation include the energy required to treat the water?*

Not applicable.

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

Electric valves, controls, and meters will operate from hydropower that is generated by the system. Meters located at remote locations will be powered by solar panels.

The outlet at the reservoir will be left open and flow will be controlled at the hydro-station. This will reduce trips up to the reservoir to control flow and reduce carbon emissions.

Evaluation Criterion C: Benefits to Endangered Species

Up to 12 points may be awarded for projects that will benefit federally-recognized candidate species or up to 12 points may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat. Note: proposals for water efficiency projects that simply state that a species in the basin will benefit from water savings (i.e., without a commitment to dedicate water savings for instream flows) shall receive minimal consideration under this criterion.

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

- *What is the relationship of the species to water supply?*

Woodruff Creek is a tributary of the Bear River, which terminates at the Great Salt Lake. Prior to entering the Great Salt Lake, diversions are made to the Bear River Migratory Bird Refuge operated by the U.S. Fish and Wildlife Service. Historically, the refuge has had some difficulty in diverting the necessary water supply to maintain a healthy ecosystem, sometimes resulting in outbreaks and disease. By increasing water inflows in the Bear River, additional supplies would be available to those species that rely on the bird refuge. There is a species of bird that is listed on the federally endangered species act, the Yellow-billed Cuckoo (threatened).

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

The increased water supply would directly lead to an improved habitat for the candidate species and reduce likelihood of disease at the bird refuge.

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

(1) How is the species adversely affected by a Reclamation project?
(2) Is the species subject to a recovery plan or conservation plan under the ESA?
(3) What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species

A recent study performed for the nearby pressurized irrigation project provided an endangered species list for the area. The only animal that was listed was the Canada Lynx. The report went on to say that there were no critical habitats within the project area. The proposed project is not anticipated to adversely affect the animal; however, a biological survey will be performed to ensure that no species are affected.

Evaluation Criterion D: Water Marketing

Up to 12 points may be awarded for projects that propose developing a new water market. Note: Water marketing does not include an entity selling conserved water to an existing customer. This criterion is intended for the situation where an entity that is conserving water uses water marketing to make the conserved water available to meet other existing water supply needs or uses outside of the entity's geographic service area.

Briefly describe any water marketing elements included in the proposed project. *Include the following elements:*

- *Estimated amount of water to be marketed*
- *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)*
- *Number of users, types of water use, etc. in the water market*
- *A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)*
- *Estimated duration of the water market*

State laws prohibit the sale of water rights that are designated for a specific plot of land, unless the land itself is sold and taken out of production. However, during the last 100 years, some development has occurred on land that used to be irrigated. Therefore, the company would be able to lease shares to Woodruff Town. The company would coordinate with the Utah Division of Water Rights to ensure no laws or regulations are broken by leasing this water.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability

Up to 14 points may be awarded for projects expected to contribute to a more sustainable water supply. This criterion is intended to provide an opportunity for the applicant to explain 1) how the project relates to a completed WaterSMART Basin Study; 2) how the project could expedite future on-farm improvements; and/or 3) how the project will provide other benefits to water supply sustainability within the basin. An applicant may receive the maximum 14 points under this criterion based on discussions of one or more of these subcriteria.

Subcriterion No. E.1 – Addressing Adaptation Strategies in a WaterSMART Basin Study

Up to 14 points may be awarded for projects that address an adaptation strategy identified in a completed WaterSMART Basin Study.

Proposals that provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed Basin Study (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes) may receive maximum points under this criterion. Applicants should provide as much detail as possible about the relationship of the proposed project to the adaptation strategy identified in the Basin Study, including, but not limited to, the following:

- *Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project and how the proposed WaterSMART Grant project would help implement the adaptation strategy.*
- *Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.*
- *Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).*
- *Describe whether the project will result in further collaboration among Basin Study partners.*

This project does not fall within one of the areas that have a completed WaterSMART Basin Study. However, the Bear River Basin is an important river basin that is included in both the Utah and Idaho State Plans.

Subcriterion No. E.2 – Expediting Future On-Farm Irrigation Improvements

*Up to 14 points may be awarded for projects that describe in detail how they will directly expedite future **on-farm irrigation improvements**, including future on-farm improvements that may be eligible for NRCS funding.*

Note: Scoring under this sub-criterion is based on an overall assessment of the extent to which the WaterSMART Grant project will facilitate future on-farm improvements. Applicants should describe any proposal made to NRCS, or any plans to seek funding from NRCS in the future, and how an NRCS-funded activity would complement the WaterSMART Grant project. Applicants may

receive maximum points under this sub-criterion by addressing the types of information described in the bullet points below. Applicants are not required to have assurances of NRCS funding by the application deadline to be awarded the maximum number of points under this sub-criterion. Reclamation may contact applicants during the review process to gather additional information about pending applications for NRCS funding if necessary.

If the proposed projects will help expedite future on-farm improvements please address the following:

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

The proposed project will aid in future on-farm improvements by providing the foundation for future projects. Similar piping projects have seen a majority of the flood irrigated fields convert to sprinkler irrigation. In this area there are approximately 700 acres that are flood irrigated and would benefit from a pressurized pipe project. Although the proposed project does not affect farm land directly, it is one step closer to having the entire irrigating system pressurized.

Subcriterion No. E.3 – Other Water Supply Sustainability Benefits

Up to 14 points may be awarded for projects that include other benefits to water supply sustainability.

Projects may receive up to 14 points under this sub-criterion by thoroughly explaining additional project benefits, not already described above. Please provide sufficient explanation of the additional expected project benefits and their significance. Additional project benefits may include, but are not limited to, the following:

- *Will the project make water available to alleviate water supply shortages resulting from drought?*
    - *Explain in detail the existing or recent drought conditions in the project area. Describe the impacts that are occurring now or are expected to occur as a result of drought conditions.*

- *Describe the severity and duration of drought conditions in the project area.*
- *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought.*
- *Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought.*

The proposed project would conserve a significant amount of water, which would alleviate the annual reoccurring drought. The conserved water is expected to extend the irrigation season, which would make a significant difference to the shareholders.

The Utah Division of Water Resources has indicated to company board members that pressurizing their system would improve their chances of receiving a grant/loan to rehabilitate Woodruff Dam to increase its storage capacity, allowing the company to put their full water right to use. The company is in the process of pressurizing the lower system. The proposed project will also aid in receiving additional loans or grants from the Utah Division of Water Resources. Storing this additional water would allow water to be held from spring run-off for summer and early fall irrigation. The additional water supply would nearly double the irrigation period and create a more sustainable and reliable water supply. Results will be easily measured by increased crops and irrigated pastures for late summer and fall feed for livestock, resulting in measurable sell weights for livestock. The additional water supply would also increase the hydroelectric potential. A study performed by the Utah Division of Water Resources estimated that crop production would increase 100%, and late summer and fall feed was estimated to increase 100 to 130%.

- *Will the project make water available to address a specific concern? For example:*
  - *Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*
  - *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.*
  - *Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?*

In dry years, the irrigation company typically needs to start calling for water releases from the reservoirs earlier than usual, resulting in an even shorter irrigation season. Unfortunately, the opposite is not true in wet years. In the area, nearly all precipitation is in the form of snow. During snowmelt season (March through May) the reservoirs fill. Due to the small size of the reservoirs, they typically fill every year; however, during wet years, the "extra" water spills and goes unused by the irrigation company. Because of the improved system efficiency, the proposed project would allow for smaller releases from the reservoirs to meet the irrigation demands. This would extend the irrigation season and reduce the negative impact caused by the lack of storage. When the reservoir is spilling the "extra" water could be diverted to produce hydropower.

In addition, the Bear River Basin covers three states: Utah, Wyoming, and Idaho. Within these three states, there are countless irrigation companies, municipalities, and individual users all vying for the same water. Any water conservation measures will improve relations within the basin.

- *Will the project make additional water available for Indian tribes?*

The project will not make additional water available for Indian tribes.

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

Yes, this project will make more water available for the rural community of Woodruff.

- *Does the project promote and encourage collaboration among parties?*
  - *Is there widespread support for the project?*
  - *What is the significance of the collaboration/support?*
  - *Will the project help to prevent a water-related crisis or conflict?*
  - *Is there frequently tension or litigation over water in the basin?*
  - *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

The project will require collaboration from several entities, including: Woodruff Irrigating Company, Woodruff Town, Reclamation, Utah Division of Water Resources, PacifiCorp, Federal Energy Regulatory Commission (FERC), and NRCS. The irrigation company shareholders have voted to implement the project. With Utah being the second driest state in the country, water conservation projects are widely supported throughout the state. Water conservation and development is a top priority for the State of Utah.

- *Will the project increase awareness of water and/or energy conservation and efficiency efforts?*
  - *Will the project serve as an example of water and/or energy conservation and efficiency within a community?*
  - *Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?*
  - *Does the project integrate water and energy components?*

The proposed project will integrate water conservation and produce a large amount of electricity. The project will conserve water that will set an example of water and energy conservation to the local and surrounding communities. The project will integrate water and energy components by constructing a hydropower facility. As Woodruff Irrigating Company has followed the example of other companies that have improved their system to conserve water, other entities will likewise follow the example of Woodruff Irrigating Company.

Evaluation Criterion F: Implementation and Results

Up to 10 points may be awarded for these subcriteria.

Subcriterion No. F.1 – Project Planning

Points may be awarded for proposals with planning efforts that provide support for the proposed project.

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

Provide the following information regarding project planning:

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

The Woodruff Irrigating Company is preparing a Water Conservation Plan and this project will be in compliance with the Utah State Water Plan.

A preliminary design has been done by Franson Civil Engineers to be used in the funding acquisition portion of the project. Preliminary pipe size, pipe lengths, alignments, cost estimates, water savings, hydropower calculations, and financial feasibility were all prepared.

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

The Utah State Water Plan for the Bear River Basin emphasizes water conservation and efficient management of developed water supplies as key strategies in providing for the present and future water needs in the state. The specific goals include water conservation, water use efficiency, and protection of state river systems.

Subcriterion No. F.2 – Readiness to Proceed

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

Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. (Please note, under no circumstances may an applicant begin any ground-disturbing activities—including grading, clearing, and other preliminary activities—on a project

before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).

The project is ready to move forward if the grant is awarded. The remaining funding will be secured from the Utah Division of Water Resources. The application is pending the award of the WaterSMART grant application. Once funding is secured, an engineering design report and the design work will begin immediately thereafter.

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

Environmental clearance will be completed before construction begins. The environmental clearance is not expected to have any major issues. The irrigation company will work with Reclamation to comply with National Environmental Policy Act (NEPA) requirements. Coordination with Rich County and the Utah Department of Transportation will be required for some road crossings and locations where the pipe is installed parallel to roadways. The company will seek FERC approval to be a qualifying conduit hydropower facility. These facilities are not required to be licensed or exempted by FERC. No issues are anticipated with obtaining the required permits.

Table 3: Project Schedule

Date	Activity
June 2016	Notice of Award from USBR
August 2016	Finalize All Remaining Funding Sources (Local, State of Utah)
September 2016	Award of WaterSMART contract Begin Preliminary Design
October 2016	Begin Environmental Clearance (No major environmental issues are expected) Begin coordination with Pacificorp File Notice of Intent for a To Construct a Qualifying Conduit Hydropower Facility to FERC Begin Design and Construction Drawing Preparation
February 2017	Complete Environmental Clearance Final Design and Construction Drawings Preparation
June 2017	Complete Design Process with Design Drawings and Specifications Agency Review and Approval (USBR and Utah Water Resources)
July 2017	Advertise for Construction Bids and Potential Material Purchase by Irrigation Company Construction Bid Opening
August 2017–June 2018	Facilities Construction
June 2018	Project Complete

Subcriterion No. F.3 – Performance Measures

Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.

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

Water meters will be installed to measure the amount of water discharged from the reservoir and diverted into the pipelines. Meter readings will clearly show the amount of water conserved when compared to the historical usages. The water conserved will be reported in the final report submitted to Reclamation.

The environmental benefits will be very apparent as the proposed water system will divert less water during the month of May. The additional water from snow-melt will stay in the creek and flow downstream to critical habitat areas.

Subcriterion No. F.4 – Reasonableness of Costs

Points may be awarded based on the reasonableness of the cost for the benefits gained.

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

For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g., manufacturer's guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.). Failure to provide this information may result in a reduced score for this section.

The 11,600 acre-feet of water used in the upper system will be better managed through the pressurized irrigation system. In addition, about 1,700 acre-feet of water will be conserved annually. Some of the water conserved will be used by the irrigation company to reduce the annual reoccurring drought during the summer months. It is anticipated that all pipe used will be HDPE or steel, which have a life expectancy of 50 years. Corrosion resistant fittings will be used to increase life expectancy of all fittings and appurtenances.

The total project cost is $6,885,200.

Evaluation Criterion G: Additional Non-Federal Funding

Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided.

$$\frac{\textit{Non-Federal Funding}}{\textit{Total Project Cost}} = \frac{\$\ 5{,}885{,}200}{\$\ 6{,}885{,}200} = \mathbf{85\%}$$

Evaluation Criterion H: Connection to Reclamation Project Activities

Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

(1) How is the proposed project connected to Reclamation project activities?
(2) Does the applicant receive Reclamation project water?
(3) Is the project on Reclamation project lands or involving Reclamation facilities?
(4) Is the project in the same basin as a Reclamation project or activity?
(5) Will the proposed work contribute water to a basin where a Reclamation project is located?
(6) Will the project help Reclamation meet trust responsibilities to Tribes?

The proposed project is connected to the Woodruff Pressurized Irrigation Project, which received a WaterSMART grant in June 2015. This project will contribute to the pressurized irrigation project by conserving additional water and producing hydropower.

The company does not receive Reclamation project water, is not on project lands, and does not involve any Reclamation facilities.

The project will not meet any trust responsibilities to Tribes.

Performance Measures

All WaterSMART Grant applicants are required to propose a method (or "performance measure") of quantifying the actual benefits of their project once it is completed. Actual benefits are defined as water actually conserved, marketed, or better managed, as a direct result of the project. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

Environmental and Cultural Resources Compliance

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why.

Note: Applicants proposing a Funding Group II project must address the environmental compliance questions for their entire project, not just the first 1-year phase.

(1) Will the project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also

explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The proposed pipe alignment will follow the river for a short stretch while most of the pipe alignment will follow existing road corridors or previously disturbed areas. There will be minimal, short-term impacts associated with installing the pipeline. All land surface disturbances would be confined to the proposed pipe alignment area and small staging areas. Contract documents for construction work will outline the responsibility of the contractor relative to dust control, air and water pollution during construction activities. Minimal environmental disturbances are anticipated. It is anticipated the NEPA environmental compliance for this project will be at the level of a small environmental assessment (EA).

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

The Canada Lynx (threatened) has been listed, but there are no critical habitats in the area. A biological survey will be performed prior to the project to ensure the species is not adversely affected.

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

Currently it is unknown if there are wetlands in the project boundaries. A survey will be performed to verify if wetlands are located in the project boundaries. Most of the proposed alignment follows an existing road and previously disturbed areas. Impacts are expected to be non-existent or very minimal.

(4) When was the water delivery system constructed?

It is unknown exactly when the canals were constructed, but the associated water rights have a priority date in 1884. The facilities were likely constructed shortly thereafter.

(5) Will the 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 canals will be replaced with pipelines in a pressurized system. As such, all canals and their structures will be abandoned.

(6) Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the Nation Register of Historic Places?
(7) Are there any known archeological sites in the proposed project area?

It is unknown if any structures are listed or eligible for listing on the National Register of Historic Places database or archeological sites. A complete cultural resources report will be prepared prior to any construction activities in the area, which will include consultation with Utah State Historic Preservation Office (SHPO), a complete Class I literature search to identify any archeological and historic architectural resources within the project area, and a Class III pedestrian inventory of the pipeline corridor, laterals, and staging areas. It is not anticipated the project will impact any archeological sites or historic structures.

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

The project will not have a disproportionately high and adverse effect on low income or minority populations.

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

The project will not affect tribal lands.

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

The project will decrease the spread of weeds and noxious weeds due to the open canal being converted to a pipeline.

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.

Applicants proposing renewable energy components to Federal facilities should note that some power projects may require FERC permitting or a Reclamation Lease of Power Privilege. To complete a renewable energy project within the time frame required of this FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying.

Woodruff Irrigating Company will file a notice of intent to construct a qualifying conduit hydropower facility. The process associated with this notice of intent generally takes up to about two months to complete.

The company has also begun coordination with PacifiCorp to pursue a power purchase agreement. Feasibility studies are currently in progress to assess what infrastructure will be required.

Appendix A

Signed Official Resolution

OFFICIAL RESOLUTION
OF THE
Woodruff Irrigating Company

RESOLUTION NO. 2016 - 1

WHEREAS, the United States Department of the Interior, Bureau of Reclamation has announced the *WaterSMART Water and Energy Efficiency Grants* in order to prevent water supply crises and ease conflict in the western United States, and has requested proposals from eligible entities to be included in the WaterSMART Program, and

WHEREAS, the Woodruff Irrigating Company has need for funding to complete Woodruff Hydroelectric Project.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors agrees and authorizes that

1. The Board of Directors has reviewed and supports the proposal submitted;

2. The applicant is capable of providing the amount of funding and/or in-kind contributions, specified in the funding plan; and

3. If selected for a WaterSMART Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED: 1/8/16

Wes Tingey, President

ATTEST:

Chad Brown

Appendix B

Probable Cost for Engineering Services

(Engineering Design and Construction Management)

Appendix C

Probable Cost for Construction Services

Appendix D

Water Rights

Water Right No.	Source	Flow (cfs)	Quantity (ac-ft)
23-1352	South Fork Woodruff Creek	1.08	
23-16	Woodruff Creek	0.49	
23-19	Woodruff Creek	1.47	
23-1953	South Fork Woodruff Creek	55.6	
23-2595	North Fork Woodruff Creek	55.6	
23-3513	North Fork Woodruff Creek		90
23-362	South Fork Woodruff Creek	0.7	
23-3650	Woodruff Creek		5400
23-423	Woodruff Creek	0.13	
23-427	Woodruff Creek	0.97	
23-428	Woodruff Creek	0.14	
23-429	Woodruff Creek	3.04	
23-432	Woodruff Creek	1.13	
23-436	Woodruff Creek	1.065	
23-437	Woodruff Creek	2.21	
23-540	Woodruff Creek	2.69	
23-541	South Fork Woodruff Creek	55.6	
23-542	Woodruff Creek	0.71	
23-543	Woodruff Creek	0.34	
23-546	Woodruff Creek	0.67	
23-547	South Fork Woodruff Creek	55.6	
23-548	Woodruff Creek	55.6	
23-549	South Fork Woodruff Creek	55.6	
23-550	South Fork Woodruff Creek	55.6	
23-553	South Fork Woodruff Creek	55.6	
23-554	Woodruff Creek	0.29	
23-558	South Fork Woodruff Creek	55.6	
23-559	South Fork Woodruff Creek	55.6	
23-560	Woodruff Creek	55.6	
23-561	Woodruff Creek	55.6	
23-565	South Fork Woodruff Creek	0.76	
23-567	South Fork Woodruff Creek	55.6	
23-569	Woodruff Creek	0.84	
23-570	Woodruff Creek	0.22	
23-571	Woodruff Creek	2.79	
23-573	Woodruff Creek	1.3	
23-577	Woodruff Creek	0.35	
23-578	Woodruff Creek	55.6	
23-580	North Fork Woodruff Creek	55.6	

Water Right No.	Source	Flow (cfs)	Quantity (Ac-ft)
23-583	Spring Creek	2.15	
23-586	North Fork Woodruff Creek	55.6	
23-589	South Fork Woodruff Creek	55.6	
23-709	Woodruff Creek, Birch Creek Dams	55.6	
23-710	Woodruff Creek	60	
23-711	Woodruff Creek	60	
23-712	Woodruff Creek	60	
23-713	Woodruff Creek	60	
23-714	Woodruff Creek	60	
23-715	Woodruff Creek	60	
23-716	Woodruff Creek	60	
23-717	Woodruff Creek	60	
23-718	Woodruff Creek	60	
23-719	Woodruff Creek	60	
23-720	Woodruff Creek	60	
23-721	Woodruff Creek	60	
23-722	Woodruff Creek	60	
23-723	Woodruff Creek	60	
23-724	Woodruff Creek	60	
23-725	Woodruff Creek	60	
23-726	Spring Creek (Woodruff Creek)	60	
23-727	North Fork Woodruff Creek	60	
23-728	North Fork Woodruff Creek	60	
23-729	North Fork Woodruff Creek	60	
23-730	North Fork Woodruff Creek	60	
23-731	South Fork Woodruff Creek	60	
23-732	North Fork Woodruff Creek	60	
23-733	South Fork Woodruff Creek	60	
23-734	North Fork Woodruff Creek	60	
23-735	South Fork Woodruff Creek	60	
23-736	South Fork Woodruff Creek	60	
23-737	South Fork Woodruff Creek	60	
23-738	South Fork Woodruff Creek	60	
23-739	South Fork Woodruff Creek	60	
23-740	South Fork Woodruff Creek	60	