WaterSMART Grant
Water and Energy Efficiency Grant for Fiscal Year 2023
Funding Opportunity Announcement No. R23AS00008

Tier II Application - $1,000,000 Grant Request

July 28th, 2022

Full System Pressurization Project
Cache Valley, Utah

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SUNRISE ENGINEERING

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1 - Technical Proposal

1.1 Executive Summary

The executive summary should include:

- *The date, applicant name, city, county, and state*
- *Please indicate whether you are a Category A applicant or a Category B applicant.*
- *A one paragraph project summary that provides the location of the project, a brief description of the work that will be carried out, any partners involved, expected benefits and how those benefits relate to the water management issues you plan to address.*
- *State the length of time and estimated completion date for the proposed project*
- *Whether or not the proposed project is located on a Federal facility*

Date:	7/28/2022
Applicant:	King Irrigation Company Thomas Reese, President Cache County, Utah 3986 N. 2400 W. Smithfield, UT 84335 435-770-6694, kingirrigationcompany@gmail.com
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Category:	Category A Applicant

Project Summary

The Full System Pressurization Project will replace three miles of canals with pressurized pipe in Benson Utah. Of the three miles of canal, 0.25 are concrete lined, and 2.75 miles are earthen canals. The length of pipe needed will be 12,000 feet. This project will also replace four inefficient and failing pump stations with one pump station to provide pressurized water for the entire system. This project will save 567.155 ac-ft of water each year (395.5 ac-ft from seepage, evaporation and transpiration; 171.23 ac-ft from metering improvements; and 0.43 ac-ft from increased delivery rates). It will also allow for energy to be used more efficiently. This project will improve sustainability of these rural communities by providing shareholders a more reliable irrigation system. Additionally, pressurizing the canals will reduce flooding, reduce risk of crop damage, and allow for irrigators to upgrade their on-farm watering methods.

Estimated Project Length:	20 months
Completion Date:	April 2024
Federal Facility:	This is not a federal facility

1.2 Project Location

Provide detailed information on the proposed project location or project area including a map showing the specific 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}.

The Full System Pressurization Project will be done in Cache County, within Benson, Utah. Figure 1 shoes the project location relative to Utah and Cache County. Benson is Southwest of Smithfield along the Bear River. The pump station that will supply water to the new system is located at 41°49'19.32" N 111°53'47.4"W. Currently, water is pulled from four separate pump stations to supply water to canals and irrigate crops. The locations of these pumps and canals can be seen in Figure 2.

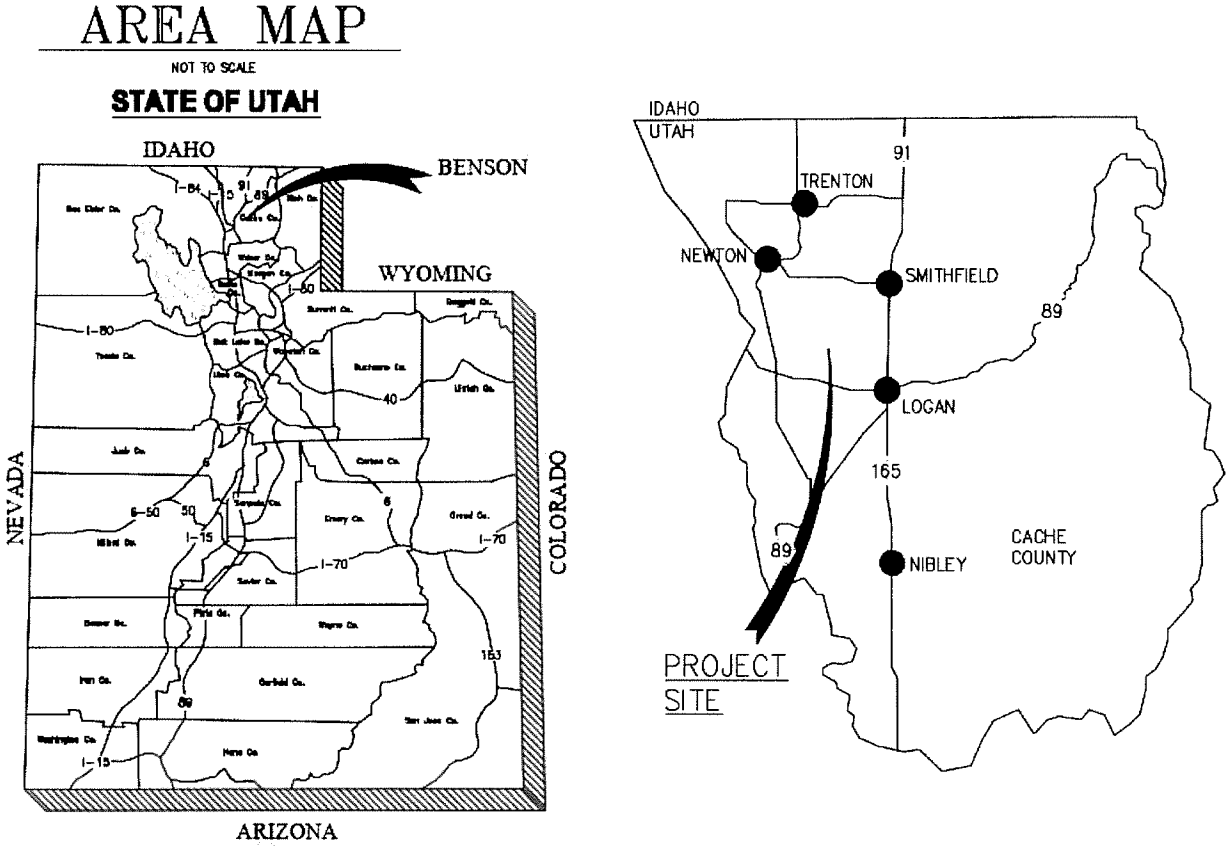

Figure 1: Project Vicinity Map

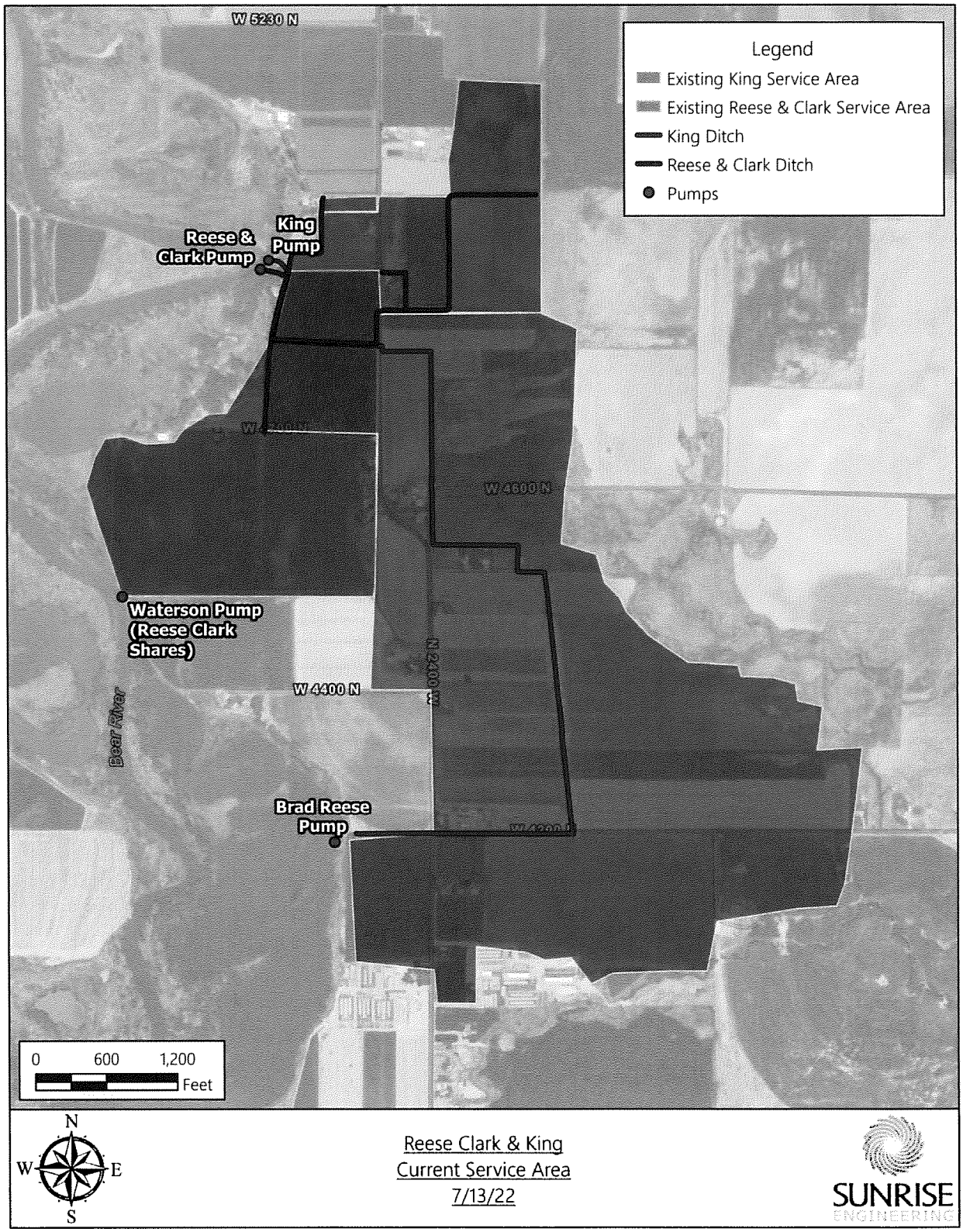

Figure 2: Current System Map

1.3 Technical Project Description

Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work. This description should provide detailed information about the project including materials and equipment and the work to be conducted to complete the project. This section provides an opportunity for the applicant to provide a clear description of the technical nature of the project and to address any aspect of the project that reviewers may need additional information to understand.

King Irrigation Company and Reese & Clark Irrigation Company supply water to 24 users using three miles of irrigation ditches. Laterals stretch from main canal to service farms and crops. This project will pipe and pressurize the canal system operated by both Companies and will result in a single pressurized network operated by a joint agreement. There are two main canals being piped with this project, the first is the Reese & Clark ditch that extends 6,500 feet long. The second canal is the King ditch, which is 9,000 feet in length. All canals will be replaced with pressurized PVC pipe. The canals convey an average of 1,537 ac-ft of water each irrigation season. Figure 3 shows the typical conditions of the canals in the system.

Figure 3: Typical Canal Conditions

This project will remove four pumps from the system: The King Pump, Reese & Clark Pump, Watterson Pump, and the Brad Reese Pump. The new system will be pressurized from a centralized location. The new pump station will be capable of supplying 7,200 gpm. This will be accomplished through three individual pumps, each capable of supplying 2,400 gpm.

The piping network will consist of a central main line. The pressurized main line will span a length of 12,000 feet to supply water for irrigators. The main line will be made of PVC Plastic Irrigation Pipe with a minimum pressure rating of 100 psi with sizes ranging from 24 in to 4 in. Illustrated in Figure 4 is a preliminary layout of the proposed pressurized pipeline. Indicated on the map are the 20 service connections as well as the location and sizes of the required pipes. Table 1 provides the various sizes of pipes needed and their accompanying lengths.

Table 1: Pipe Breakdown

Diameter of Pipe (in)	Length (ft)
24	750
21	2650
18	1070
15	2200
10	3100
8	2050
4	180
Total	**12000**

There will be 20 connections installed during this project. Connections will consist of two gate valves for isolation and controlling flow, and an inline flow measuring meter. Each flow meter will have the outputs necessary for the individual irrigators to use for their on-farm practices if they desire. A schematic of an irrigation connections is shown in Figure 5. Interviews were conducted with irrigators to determine connection location and sizes. Presented in Table 2 is the number of connections and their sizing with anticipated flow rate.

Table 2: Connection Information

Size (in)	Flow Rate (gpm)	Number of Connections
10	1,100	3
8	750	7
6	450	7
4	200	3
	Total	**20**

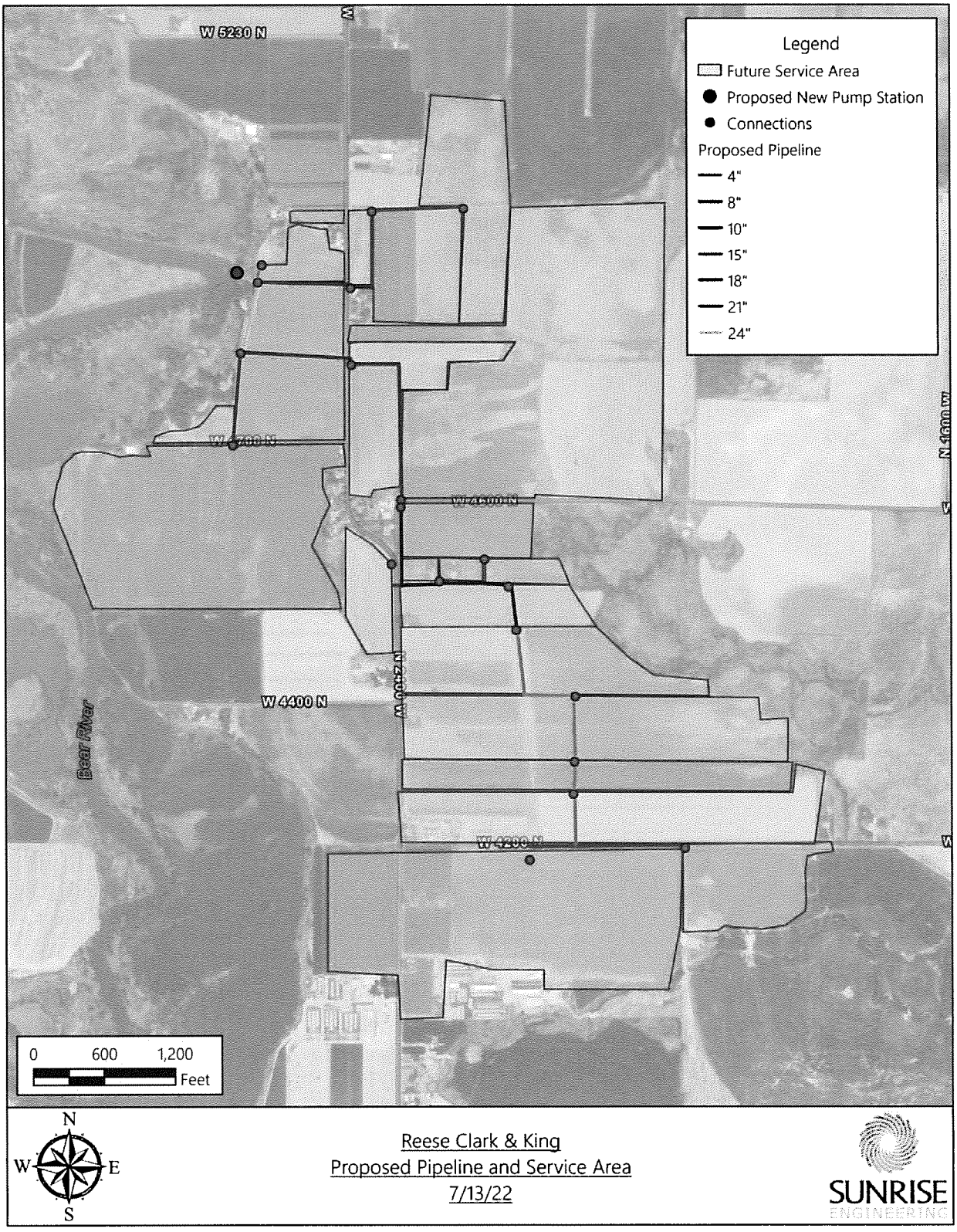

Figure 4: Proposed System

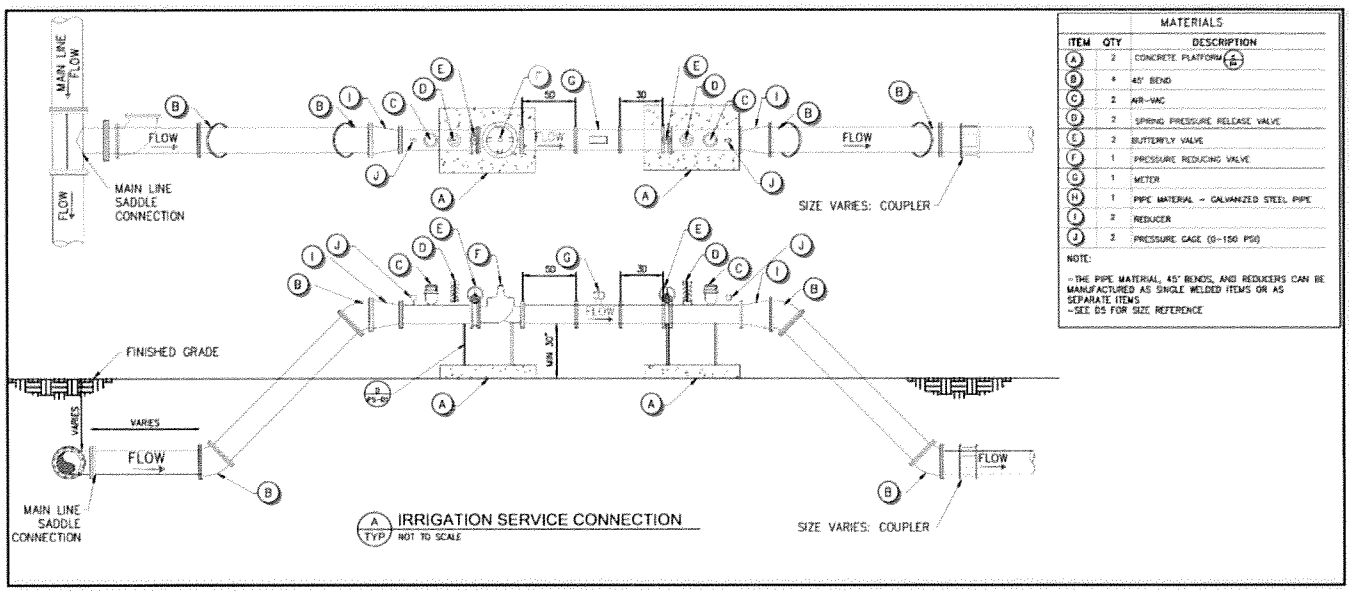

Figure 5: Irrigation Service Schematic and Connection

The pump station to be installed will be controlled with internal telemetry system. These systems are capable of monitoring the intake of the pump and ensure smooth operation of the pump station. If problems arise, the telemetry system notifies the water master immediately so action can be taken. This pump station will be equipped with three pumps; all three pumps will have a variable frequency drive. This particular set up will allow each pump to be adjusted to provide the required flows and pressures of the system. In the event one pump fails, the other two pumps will be able to support the system up to 70% operation levels while the out-of-commission-pump is repaired. The pump station will be fed by the Bear River and will be screened using three rotary drum filters equipped with brushes and back-washing nozzles.

The proposed project involves two irrigation companies, the King Irrigation Company, and Reese & Clark Irrigation Company (the Companies). King Irrigation Company is the official applicant. Reese & Clark Irrigation Company has signed a letter of commitment to this project and is an equal partner. Included in Appendix A is an official commitment letter from the Reese & Clark Irrigation Company.

Both companies own and operate canals in the same area and even have ditches that run parallel. The new pipeline will replace the entire existing canal system and will provide pressurized water for all shareholders. Current irrigated areas are shown in Figure 2 of the two companies. These companies have 24 users combined with water rights summing to 6.47 cfs. Due to their proximity and overlap of user, the two companies have decided to fund this project jointly to best serve shareholders. Water shares for individual users will not change upon completion of this project and will be monitored using individual service connections meters to ensure proper usage according to water rights. Table 3 outlines currently owned water rights. These water rights are

then broken into shares that are sold to users. The King Irrigation Company has 208 shares and Reese & Clark Irrigation Company has 118 shares.

Table 3: Water Right Information

Company	Water Right	Priority	Amount (cfs)
King Irrigation Company	25-5087	6/15/1917	4.47
Reese & Clark Irrigation Company	25-4647	7/31/1969	2

2 - Evaluation Criteria

2.1 Evaluation Criterion A—*Quantifiable Water Savings*

*Up to **28 points** may be awarded forthis criterion. This criterion prioritizes projects that will conserve water and improve water useefficiency, supporting the goals of E.O. 14008. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to consider projects that are expected to result in more significant water savings.*

All applicants should be sure to address the following:

- ***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.*

King Ditch draws on average 2.23 cfs and Reese & Clark Ditch draws 2.0 cfs on average from the Bear River during the irrigation season, April 15th to October 15th. The irrigation season is 183 days (50% of the year). Throughout the course of season, 1,537 ac-ft are used for irrigation by the two ditches. Using the canal loss estimation method documented in the United States Department of Agriculture's National Engineering Handbook, a total water loss of 395.5 ac-ft during the irrigation season was calculated. Four iterations of the calculations were done, the first was for the King Ditch system, and three were done for the Reese & Clark Ditch system and their different laterals. Combining both iterations gave the total water loss for the irrigation canal system. Table 4 illustrates both sections of canal and their respective water losses due to seepage, evaporation, and vegetation uptake.

Table 4: Water Loss Breakdown

Company	Evaluation Section/Area	Length of Section (ft)	Water Demand	Seepage Loss	Evaporation Loss	Vegetation Loss	Total Loss
Reese & Clark Irrigation	North Lateral	1,080	104	2.5	0	0	2.5
Reese & Clark Irrigation	South Lateral	1,500	311.5	18.5	2	0.5	21
Reese & Clark Irrigation	East Lateral	4,600	331.5	56	5.5	1.5	63
King Irrigation	Full System	10,200	810	273.5	27.5	8	309
			Total	350.5	35	10	**395.5**

* The method used to derive water losses is limited to a 0.5-acre ft/year accuracy. These values were below that and are thus not valid.
**All losses are in units of ac-ft/year.

The nature of how the Reese & Clark canal is operated changed the length used for the loss calculation. The entire canal is not used all at once. There are different sections used at different times. There are three laterals that operate exclusively from each other. There is the North Lateral, that is operated for one day per week. There is also the South and East Laterals that both are used for 3 days each week. Each lateral was evaluated independently to determine losses.

With a total demand of 1537 ac-ft/year and a loss of 395.5 ac-ft/ year, the percent loss is calculated as follows:

$$\frac{395.5\ ac*ft/_{year}}{1537\ ac*ft/_{year}} = 0.257 = 25.7\%\ Loss$$

By piping the King Ditch and Reese & Clark Ditch, approximately 25.7% of water in the canal will be conserved. Currently, 25.7% is being lost to seepage, evaporation, and undesired vegetation uptake. This water will now be available to be used for its intended purpose. Additionally, users will now have pressurized water available directly on their farms.

- ***Describe current losses:*** *Please 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)?*
-
    - *Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

    Current losses are predominantly seeping into the ground. More than 88% of all water losses seep into the ground. About 9% are lost to evaporation and 3% of all losses are lost to unwanted vegetation uptake along the banks of the canal.

    - *If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?*

    Current losses are not being used for any beneficial use. Losses to seepage are not returning to the system. Losses are not entering into an impaired groundwater table to the knowledge of the Companies. The water this is seeping into the ground around the canals and is damaging crops.

    - *Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?*

    There are no known benefits associated with current losses. Seepage is lost to the ground and doesn't create ponding elsewhere as a fish habitat or provides for known springs or any other beneficial uses. Current water lost to seepage is a nuisance to farmers.

- ***Describe the support/documentation of estimated water savings:*** *Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. 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.*

Seepage losses were determined using a method outlined in the United States Department of Agriculture Soil Conservation Service's National Engineering Handbook in Chapter 2. This chapter details how irrigation water should be used and can be conserved. A full reference has been included in Appendix B. This method is an empirically driven solution that uses the geometry of the channel and the soil that surrounds the canal. Geometric data was gathered through site visits. Soil information was gathered from the United States Geological Survey (USGS) online database. Soil data has also been included in Appendix B.

The method outlined in the National Engineering Handbook also provides guidelines to determine water loss due to evaporation and vegetation uptake. Evaporation is generally taken as 10% of the amount lost due to seepage. This value has been found through research and is consistent with the National Engineering Handbook as well as a published research

article from Utah State University (USU) titled "How Well Does Your Irrigation Canal Hold Water? Does it Need Lining?", and a published presentation from the NRCS entitled "Irrigation Water Conveyance".

Water loss due to vegetation is dependent on flows going through the canal. Typically, vegetation losses range from 0.5% to 1% of all flow depending on the amount of vegetation in the canal. Since the Company's canal are moderately vegetated, a 0.5% loss factor was used. This value is also supported by the National Engineering Handbook and the NRCS publication "Irrigation Water Conveyance

Please address the following questions according to the type of infrastructure improvement you are proposing 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.*

    Estimations for average annual water savings were calculated by taking the total losses and subtracting losses that will result from the new system. The new system will be a pressurized pipeline, these systems have relatively low amounts of water losses. Current losses have been calculated to be 395.5 ac-ft each season. These calculations have been included in Appendix B and are detailed in the following section.

    Losses for the new system are projected to be minimal due to the nature of PVC pipe that will be installed. However, if fittings are not installed correctly, leaks could occur. The National Engineering Handbook states that buried pipeline losses range from 0.01 to 0.15 ft^3/ft^2 per year of wetted perimeter depending on the age of the pipe. New pipe will be installed, therefore a value of 0.01 is used for the loss calculation.

Table 5: New System Losses

Pipe Diameter (in)	Pipe Circumference (ft)	Pipe Length (ft)	Total Wetted Perimeter (ft^2)
24	6.28	750	4,800
21	5.50	2,650	14,600
18	4.71	960	4,600
15	3.93	2,110	8,300
12	3.14	3100	9,800
10	2.62	2,050	5,400
4	1.05	175	200
	Total	**12,000**	**47,700**

$$47{,}700\ ft^2 * 0.01 \frac{\frac{ft^3}{ft^2}}{yr} = 477 \frac{ft^3}{yr} = 0.01095\ \frac{acre\ ft}{yr}$$

Total water savings will be 395.5 ac-ft per year since the losses from the new system are nearly negligible when compared to the losses that are currently experienced.

b. How have current system losses and/or the potential for reductions in water use by individual users been determined?

The United States Department of Agriculture Soil Conservation Service's National Engineering Handbook outlines a method for determining canal losses. This method was used to calculate the amount of water that is lost due to seepage. Within this handbook Chapter 2 details irrigation watering best practices. A full reference has been included in Appendix B. This method is an empirically driven solution that uses the geometry of the channel and the soil that surrounds the canal. Geometric data was gathered through site visits. Soil information was used from the United States Geological Survey (USGS) online database. Soil data has also been included in Appendix B.

The method outlined in the National Engineering Handbook also provides guidelines to determine water loss due to evaporation and vegetation uptake. Evaporation is generally taken as 10% of the amount lost due to seepage. This value has been found through research and is consisted with the National Engineering Handbook as well as a published research article from Utah State University (USU) titled "How Well Does Your Irrigation Canal Hold Water? Does it Need Lining?", and a published presentation from the NRCS entitled "Irrigation Water Conveyance".

Water loss due to vegetation is dependent on flows going through the canal. Typically, vegetation losses range from 0.5% to 1% depending on the amount of vegetation in the canal. Since the Company's canal are heavily vegetated a 1% loss factor was used. This value is also supported by the National Engineering Handbook and the NRCS publication "Irrigation Water Conveyance".

Potential reductions in water use by individual users is projected to be 20-30% This is based on studies that have been done in Utah on metered irrigation connections. These studies have shown that connections that get metered decrease consumption by 20-30% on average. A similar reduction is expected from this project. However, this value was not included in the total water savings as it is a future expected benefit.

c. *For installing end-user water service meters, e.g., for a residential or commercial building unit., 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.*

Within the two systems, users own assigned shares of water that equate to a portion of the total water right for their use. However, due to the nature of the system and without flow measurement devices, it is difficult to accurately assess consumption. The Full System Pressurization Project will install flow meters as part of the connection to each user. Figure 5 shows a schematic of each connection and how the meter will be installed.

Weber Basin Water Conservancy District (WBWCD) have found that "areas that have installed secondary meters have seen a reduction in water use by about 20-30%." The Companies expect similar reductions in consumption for their system. This will not adversely affect shareholders either since more water will be available due to water savings. This creates a mutually beneficial scenario; the Companies don't have to pump as much water and shareholders can still use the water they need. It is anticipated that the additions of secondary meters will result in additional water savings of 15%. This evaluation is discussed in detail later in this document.

d. *What types (manufacturer and model) of devices will be installed and what quantity of each?*

Meters that will be installed will be a Dura Mag McCrometer. There will be 20 meters installed during this project, refer to Table 2 for size and quantity of meters.

e. *How will actual water savings be verified upon completion of the project?*

Flow measuring devices will be installed at key points along the pipeline to monitor the actual flow through these key points. Each turn out/irrigation connection will have a flow measuring device to accurately measure and record the amount of water leaving the pipe system for irrigation usage. A primary flow measuring device will be installed at the head works of the piping system. This measuring devices will provide accurate readings of how much water is being placed in the piping system

The pump station will be equipped with an internal telemetry system controls and data logging abilities. The meters will be read monthly will be able to link to the local farmers

system. With the detailed information provided by the individual flow measuring devices, farmers can control their individual irrigation systems remotely and with greater efficiency. Hopefully leading to even more water savings for the system and community.

3. ***Irrigation Flow Measurement:*** *Irrigation flow measurement improvements can provide water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators. Applicants proposing municipal metering projects should address:*

a. *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*

Annual water savings estimates from irrigation flow measurement have been determined by using a study that has provided by the Weber Basin Water Conservancy District (WBWCD). WBWCD found that secondary metering reduced consumption by 20-30%. The study was conducted over 6 years, 2012-2018, with connections of all types considered. Residential, agricultural, and commercial connections were included in the study. Even though the type of connection varied, the results did not; metering secondary water decreased consumption by 20-30% consistently.

The value that was previously calculated for water losses due to seepage, evaporation, and vegetation uptake is 395.5 ac-ft/year. By subtracting that value from total water entering the system, 1,537 ac-ft/year, we obtain the water that is used by irrigators. This amount is 1,141.5 ac-ft of water each year. Assuming a 15% water savings, water savings equate to 171.23 ac-ft of water each year. Table 6 breaks down the water savings from metering.

Table 6: Water Savings from Meters

Total Water Entering System (ac-ft)	Water Losses (ac-ft)	Water Used by Irrigators (ac-ft)	15% Savings (ac-ft)
1,537	395.5	1,141.5	**171.23**

Calculation Ran: Water Use Reduction from Secondary Meters

*1,141.5 ac-ft/year * 15% reduction in use =* ***171.23 ac-ft/year***

b. *Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.*

Current operational losses are estimated to be at a minimum. The current operation allows for "spill water" to be utilized by irrigators for flood irrigation as needed.

c. *Are flows currently measured at proposed sites and if so, what is the accuracy of existing devices? How has the existing measurement accuracy been established?*

Currently, flows are measured at each of the four pumps. After water leaves the pump station there are no other flow measurement devices. The measurement at each of the four pumps are accurate enough to supply the Utah Water Rights division an annual report of consumption. The accuracy of the meters is limited to 1 acre-ft for volumetric measurements and 0.1 cfs for flow rate measurements. Often times the existing meters on the pumps are not properly maintained which results in long periods of time in which data is not being reported.

d. *Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.*

Meters are proposed to be installed on each of the three pumps at the pump station and one meter on each service connection. The proposed meters are Dura Mag Meters manufactured by McCrometer. The meters are available in sizes from 2" to 12" and a magnetic inline flow meter with no internal moving parts. The meter is accurate within +/- 1.0% of the displayed flow reading in gpm. The basis of the accuracy requires 2 diameters of the meter size upstream of the meter to be uninterrupted pipe flow conditions and that 1 diameter of the meter size down stream is uninterrupted pipe flow conditions.

e. *Will annual farm delivery volumes be reduced by more efficient and timelier deliveries? If so, how has this reduction been estimated?*

It is anticipated that delivery time of the water will be reduced. This is a direct result from piping the canal. The open flow conditions travel at about 1 to 2 feet per second whereas the pressurized system will transport water close to 4 to 5 ft/sec. This reduced deliver time will allow for quicker changes and more effective water schedules. This will reduce "change water" losses. Change water is water that is lost during irrigation water schedules when pipes or fields are changed, moved, or rotated through the watering cycles. In the past, water would take approximately 2.8 hours to reach the end of the King Ditch system and 1.8 hours to reach the end of the Reese & Clark Ditch system. With the new system in place, water will be delivered to the farthest user of the system in about 35 minutes. Previously the "change water" losses for the King Ditch were on average 500 gpm (average field demand) for 2.8 hours (time delay in system) which equates to 0.26 acre-feet (11,229 ft^3) of water losses. The Reese & Clark Ditch have been experiencing "change water" losses of about 500 gpm (average field demand) for 1.8 hours (time delay in system) which equates to 0.17 acre-feet

(7,218 ft^3) of water losses. The new piped system will not experience any "change water" losses as all water will be retained inside the pipe and valves will be available on all service connections to close of field systems during watering schedule shifts. The proposed project will result in an additional **0.43 acre-feet** of water savings from improved delivery methods.

f. How will actual water savings be verified upon completion of the project?

Water savings will be verified by the meters that will be installed. Data will be collected and compared to previous records to determine the amount of water that will be saved after the project is finished. Located in Appendix XX are the sates records for water use along these systems. This is the data set that will be used for comparison to evaluate actual water savings.

2.2 Evaluation Criterion B—*Renewable Energy*

2.2.1 - Subcriterion B.1: *Implementing Renewable Energy*

Up to 20 points may be awarded for projects that include constructing or installing 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.

This project will not have a renewable energy aspect and is therefore considered under Subcriterion B.2. with response details found in the following section, 2.2.2

2.2.2 - Subcriterion B.2: *Increasing Energy Efficiency in Water Management*

Up to 10 points may be awarded for projects that address energy demands and reduce greenhouse gas emissions 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 efficiency project (e.g., reduced pumping).

- *If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*

Both companies operate pumps to supply water to their canals. The King Pump was installed in 1967, 55 years ago. It is old, inefficient and in need of replacement. Figure 6 shows the current condition of the King Pump station. It is leaking water and oil within proximity to the Bear River. The Reese & Clark Pump is not as old, but still needs to be replaced as it is needing repairs and is also leaking. Both of these pumps pull water from the Bear River and discharge into the open ditches. The proposed project will remove these pumps and replace

them with pressurization pumps. This project will also allow the companies to take two other pumps offline, the Brad Reese Pump and the Watterson Pump.

Figure 6: King Pump Station

This project will also allow the Companies to take two other pumps offline, the Brad Reese Pump and the Watterson Pump. The Brad Reese and Watterson Pumps supply pressurized water to a small, localized area. The Brad Reese Pump is a newer and the most efficient pump operated within the system, supplying water to 26.5 acres of farmland. To run the Brad Reese Pump the entire season it requires 39,400 kWh of energy. This equates to 1,492 kWh/ac to supply water to this area for the season.

The Watterson Pump is the only diesel pump that operates within this system. This pump provides water for 36.1 acres of ground. The pump requires nearly 2,800 gallons of diesel fuel each year to pump the necessary amount of water. Meaning that this pump uses 94,769 kWh each season to convey irrigation water (conversion of diesel fuel to kWh was completed using conversion rates provided by EPA). This pump provides water at 2,632 kWh/ac.

The new system will operate three separate pumps to provide water to all 509 acres of farmland. Current projections of energy required based on the proposed pumps total to 685,573 kWh to provide water to the entire system for the whole season. While the total energy requirement will be greater than what is currently being consumed, the system will

become more efficient. The new system will require that 1346 kWh/ac be used for the entire system. This is significantly lower than what the Watterson and Brad Reese pump are currently operating at. The new system will be 10.2% more efficient than the Brad Reese Pump and 64.7% more efficient than the Watterson Pump when evaluating the energy demand to pressurize on an acre basis.

If all the farms were to be pressurized using individual pumps on the banks of the open ditches, the installation of 18 individual pumps would need to occur, each operating close to the efficiency rates of the Brad Reese Pump. This would result in a fully pressurized service area, with the use of 22 pumps and would consume approximately 853,421 kWh. To accomplish the same benefit with a centralized pump and pipe network, the same 509 acres if proposed to be pressurized using 685,573 kWh, which is 167,848 kWh less than the alternative of pressurizing all induvial farms, a 19.7% efficiency gain. Energy calculations are summarized in Table 7.

Table 7: System Energy Breakdown

***Current System Operation with Full Pressurization**			
Pump	**Yearly Usage (kWh)**	**Area Served (ac)**	**Consumption per Acre (kWh/ac)**
New Individual Pumps (18)	666,029	446.4	1,492
Reese & Clark	9,270	169.4	55
King	43,963	277	159
Brad Reese	39,389	26.5	1,492
Watterson	94,770	36.1	2,632
Total	853,421	509	1,679
Proposed System Operation with Full Pressurization			
Pump	**Yearly Usage (kWh)**	**Area Served (ac)**	**Consumption per Acre (kWh/ac)**
New Pumps (3)	685,573	509	1346
Comparison			
Energy Savings (kWh)	**167,848**	**Efficiency Gain**	**19.7%**

*This scenario is a projected scenario to compare full pressurization using individual pumps to full pressurization using a central system

- *How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.*

The proposed project will prevent a future energy demand of 167,848 kWh from occurring (131 tons of CO_2). As more and more incentives arise to use pressurized water for irrigation, more and more flood irrigation farms will be converted to pressurized systems. This project will provide a more efficient method for on-farm pressurization. Additionally, the new system is 100% electric which can be supplied from renewable sources. Whereas the Watterson Pump is a diesel pump that uses an average of 2,800 gallons of diesel each year. This pump produces 31.2 tons of carbon dioxide according to the EPA conversion calculator. All three of the new pumps will be electrical and avoid excessive greenhouse gas emissions. The Watterson Pump will be taken offline upon completion of this project, reducing emissions by at least 31.2 tons of CO_2.

- *If the project will result in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed projects impact the current pumping requirements and energy usage?*

Current pumping requirements for all four pumps combined is 2400 gpm. The King Pump is a 10-hp pump, and the Reese & Clark Pump is a 25-hp pump. The other two pumps supplying water to the system are the Brad Reese Pump, 40-hp, and the diesel fuel Watterson Pump. The pumping requirements will increase now that the entire system is pressurized. Future demand for the pressurized system is estimated to be 7,200 gpm. More energy will be put into the system, and this energy will be used more efficiently. Table 8 summarizes consumption of each pump and the projections for the new pumps. Table 7 shows the difference in efficiency between the two systems.

Table 8: Pump Energy Consumption

Pump	Yearly Usage (kWh)	Area Served (ac)
Reese & Clark	9,270	169.5
King	43,963	277
Brad Reese	39,389	26.4
Watterson	94,770	36.1
Total	**187,392**	**509**
New Pumps (3)	**685,573**	**509**

- *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.*

The energy efficiency increases will come from the pump station. This will be the point of diversion. The energy savings will come from the removal of four pumps on the Bear River.

- *Does the calculation include any energy required to treat the water, if applicable?*

No energy is currently required to treat the water. After the project is finished, no energy will be used to treat the water.

- *Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.*

Yes, currently the water master for two companies is forced to change the direction of flow in the canal every three days. Once the system is pressurized, the water master will no longer be forced to manually divert water. It will save him trips to the diversion site saving on greenhouse gas emissions. It is estimated that the water master makes one trip to the diversion site daily and one trip to the canal diversion daily. Each trip is approximately 2 miles of travel. Over the irrigation season this results in 732 miles traveled (0.326 tons of CO^2). With the completed project, a trip will need to be made to the pump station every other day to check screens and pump conditions. The pumps will be set to operate without supervision using the internal telemetry. This will result in a 2-mile trip every other day for the irrigation season which is 183 miles traveled (0.082 tons of CO^2). The project will have anticipated net effect of reducing greenhouse gas emissions by 0.244 tons of CO^2 by reducing the total miles driven to operate the system.

- *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).*

There are no renewable energy components within this project.

2.3 Evaluation Criterion C—*Sustainability Benefits*

*Up to **20 points** may be awarded under this criterion. This criterion prioritizesprojects that addressa specific water and/or energy sustainability concern(s), including enhancing drought resilience, addressing the current and future impacts of climate change, and resolving water related conflicts in the region*

***Enhancing drought resiliency.** In addition to the separate WaterSMART Environmental Water Resources Projects NOFO, this NOFO places a priority on projects that enhance drought resiliency, through this section and other sections above, consistent with the SECURE Water Act. Please provide information regarding how the project will enhance drought resilience by benefitting the water supply and ecosystem, including the following:*

- *Does the project seek to improve ecological resiliency to climate change?*

Yes, this project does seek to improve ecological resiliency to climate change. In Utah temperatures have increased steadily for the past 20 years according to Drought.gov. This change causes a domino effect on the environment in Utah. Increases in temperature lead to snowpack melting earlier in the season, making less water available later in the summer when water is vital for crop growth. Increased temperatures also require farmers to irrigate crops more because less water is

coming in the form of moisture and precipitation. This increased temperatures also increase evaporation losses during conveyance in the open channels and during on-farm flood applications.

This project will help make this irrigation system more resilient to climate changes as it eliminates water losses during conveyance and helps encourage the implementation of more efficient watering practices for the on-farm systems. The project will reduce water loss to make more water available to be used for its intended purpose. Making the entire system more resilient as the climate continues to change. It will help crops survive the hottest part of the summer and provide quality yields.

- *Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits (e.g., maintaining water temperatures or water levels).*

With the pipe in place, the water delivery rate will increase three-fold, thus significantly reducing the time water remains in the system. With the project water savings, more water will remain in the Bear River helping maintain water temperatures and water levels in the Bear River system.

- *Will the project benefit species? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).*

The canals are not home to any endangered or threatened fish species, nor is it used by fish for passage. This project won't have any effect on species within the system or the surrounding area. This project will help reduce the amount of water required by the irrigation system thus leaving more water in the Bear River. The Bear River is home to a wide variety of fisheries, fowls, and other animal groups. This project will encourage the reduction of the total water demand thus improving the ecological systems dependent on water levels in the Bear River lower than the irrigation systems diversion.

- *Please describe any other ecosystem benefits as a direct result of the project.*

The Full System Pressurization Project will allow for more water to be left in the Bear River since the companies will not be needing it for irrigation purposes. This will benefit fish populations that are native to the Bear River. Species like Brown Trout, Rainbow Trout, and Channel Catfish will benefit from this project.

- *Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?*

Yes, this project will allow for more flexibility to water managers. The pump station will be equipped with a internal telemetry system that will provide an accurate assessment of the system at all times. The pump station will have the ability to be remotely started or stopped. Additionally, the pressures and flow rates will be available remotely to help aid the management of the system.

The individual flow meters on the service connections will also provide valuable data on how to operate the system and who may need more or less water. The meters will also help ensure honesty in the amount of water used and will help prevent un-equal usage of the water. This will help the water manager direct water to where it is needed rather than where the largest demand is.

Additionally, the new system will have all three pumps in a single location. The single pump station will provide flexibility when one of the new pumps is taken offline. The other two pumps can provide 70% of maximum water demand for the system. By having all three new pumps in one location, shareholders will not have to wait for repairs to be completed to continue watering their crops.

Addressing a specific water and/or energy sustainability concern(s). *Will the project address a specific sustainability concern? Please address the following:*

- *Explain and provide detail of the specific issue(s) in the area that is impacting water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.*

Cache County has experienced drought conditions for the past 22 years according National Oceanic and Atmospheric Administration (NOAA). Currently, 37% of Cache County is in Extreme Drought with the entire Cache County being in a Severe Drought. These conditions force the King Irrigation Company and the Reese & Clark Irrigation Company to pull more water from the Bear River than they typically do. Drought conditions also mean dryer soil conditions and increased average temperatures. Both of which cause a greater demand to irrigate crops more to ensure that crops grow properly. Figure 7 shows the severity of the drought conditions within Cache County. The proposed project will help the irrigation system use water more efficiently to help combat the extended drought conditions.

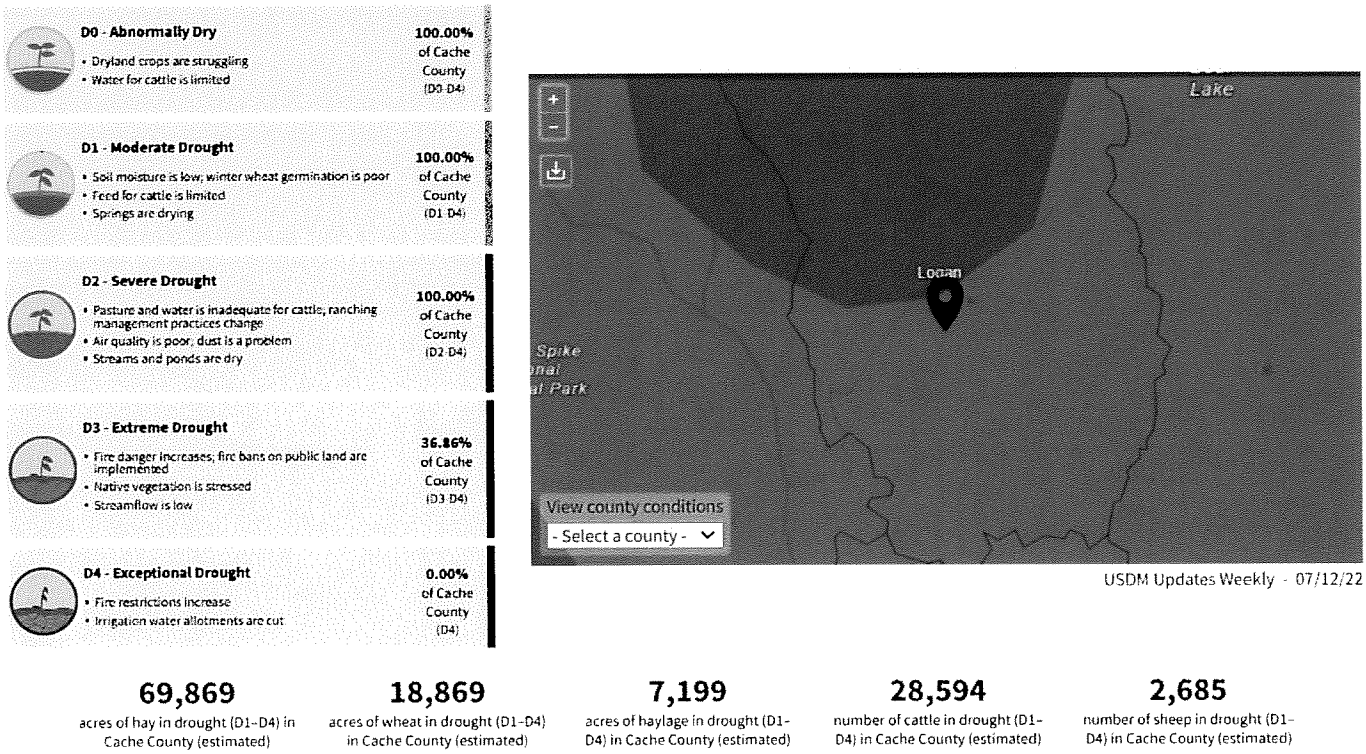

Figure 7: Cache County Drought Conditions

- *Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.*

Cache Valley is reliant on non-renewable resources for their energy. Much of the energy that is used in the valley is produced from fossil fuels and natural gas. This dependency could prove to be an issue if supplies begin to run out and alternatives have not been identified. The Watterson Pump is ran on diesel fuel which has cost the company nearly double in fuel with diesel prices rising in the past year. In 2021, the Companies spent $8,219.66 on fuel for the entire irrigation season. As of July 5th, the Companies have already spent $9,557.63 and estimate that fuel costs for the whole season will be $13,100. Converting the entire system to electrical the potential to become more independent from fossil fuels becomes a reality. Ultimately it will be up to the power company to decide the means for energy production, but the irrigation company will be completely electric with the completion of this project.

- *Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?*

This project will address the reliance that the valley has on fossil fuels and natural gas by using energy more efficiently to irrigate crops. The system will also be entirely electric by the end of this project. This will make the resources that are available last longer. It will also remove the Watterson Pump from the system. This will reduce the consumption of diesel fuel dramatically. It will also make the community less reliant on non-renewable resources.

The proposed project will also help the company become more insulated from the effects of the prolonged drought. By reducing water losses and increasing the efficiency of the water conveyance system, more water will be available for crop application. Additionally, the completion of a central pressurized system will help facilitate the completion of on-farm improvement that will further increase the efficient of water application on crops helping the farms use water more precisely and as needed.

- *Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

Water that is not pumped and used for irrigation purposes will remain in the Bear River. The Bear River empties into Cutler Reservoir. Part of Cutler Reservoir is the Cutler Dam that produces hydropower. Water that is not pumped out of the Bear River by the Companies will be available for power generation at the Cutler Dam. This electricity is then used locally to support various communities in Cache Valley and is considered a green energy source.

Water that leaves Cutler Reservoir flows downstream to the Great Salt Lake. The Great Salt Lake has recently reached its lowest levels on record. In 1980 the lakes surface spanned 3,300 square miles; it now covers less than 1,000. If the Great Salt Lake continues to dry up, the consequences could be severe. The foremost of which is the dust that will be exposed to the air. This dust is poisonous for human consumption as the bed of the Great Salt Lake contains high levels of arsenic. Another consequence will be that this dust that is exposed will create dust storms. The dust from these dust storms will end up in the snowpack in the mountains, making it darker. This change in color will increase albedo and melt the snowpack faster. Therefore, any water that can be conserved and sent to the Great Salt Lake will be a great benefit for everyone in the Salt Lake Valley.

- *Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*

No mechanism will be needed for the conserved water. The Bear River empties into Cutler Reservoir and the Great Salt Lake naturally.

- *Indicate the quantity of conserved water that will be used for the intended purpose(s).*

There are three ways that water is conserved due to this project. The first is from reduced consumption due to metering. The amount that is projected to be conserved is 171.23 ac-ft per year. The second way that water is reduced is water that is saved from seepage, evaporation, and vegetation uptake. This value equates to 395.5 ac-ft per year that is saved due to the project. The third way water is saved is by eliminating "change water" losses as discussed earlier. It is estimated that 0.43 ac-ft per year is lost due to "change water". Totaling **567.16 ac-ft** of conserved water each year. This value is dependent on the water availability each year as well as water rights that receive quantity cuts during low water years.

Other project benefits. *Please provide a detailed explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:*

1) ***Combating the Climate Crisis:*** *E.O. 14008: "Tackling the Climate Crisis at Home and Abroad", focuses on increasing resilience to climate change and supporting climate- resilient development. For additional information on the impacts of climate change throughout the western United States, see: https://www.usbr.gov/climate/ secure/docs/2021secure/2021SECUREReport.pdf. Please describe how the project will address climate change, including:*

Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.

- *Does this proposed project strengthen water supply sustainability to increase resilience to climate change?*

Yes, this project will strengthen water supply sustainability. It will accomplish this on two major fronts. The first is that there will be a significant reduction in water losses within the system. The project will save water through loss prevention and increasing water use efficiency. By reducing loss and increasing efficiency, the water demand for the system will decrease significantly helping conserve preserve available water in the Bear River. Thus, helping this valuable resource extend its benefits. The reduced demands on the Bear River will also help insulate the irrigation companies against the ongoing climate change. As climates continue changing, the new system will help them monitor and regulate their water use and aid them in tailing their operations to the current needs.

- *Will the proposed project establish and utilize a renewable energy source?*

This project will not establish a renewable energy source. However, this project does allow for the companies to use energy more efficiently. And will leave more water in the Bear River to be utilized in the existing hydro power plant on the Cutler Reservoir.

- *Will the project result in lower greenhouse gas emissions?*

The current irrigation demands do use less energy than the proposed project. However, the current system only provides pressurized water to 12.3% of the area serviced by the companies. The proposed project will provide pressurized irrigation water to the entire system and will accomplish it for less energy per acre than is currently being accomplished.

2) ***Disadvantaged or Underserved Communities:*** *E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including:*

- *Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community?*

This project will support rural and economically disadvantaged communities. The majority of the users live in Benson, Utah. Benson Utah is considered economically disadvantaged based of median household income of $50,370 in 2020. This income is 38% lower than the median household income for the entire state of Utah. This project will increase the reliability of crops through increased water supply reliability. Water will be better managed as well through the implementation of a telemetry system and meters.

- *If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act, which is defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State, or the applicable state criteria for determining disadvantaged status.*

The proposed project will serve the area in and around Benson, Utah which has a small population of just 1,793. The median household income in Benson is $50,370.

That is 38% lower than the median household income for the state of Utah. Making this area of Benson economically disadvantaged.

- *If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.*

The town of Benson is an economically underserved community due to its small size. With such a small population base, the community cannot afford significant infrastructure projects or other community type improvements. They are often left to deal with outdated and archaic systems to accomplish work. The current irrigation system is failing in multiple locations and will require a great deal of repairs if not re-constructed as a pressurized pipeline.

Tribal Benefits: *The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. The President's memorandum "Tribal Consultation and Strengthening Nation-to-Nation Relationships" asserts the importance of honoring the Federal government's commitments to Tribal Nations. Please address the following, if applicable:*

- *Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?*

The project does not directly serve of benefit to a Tribe.

- *Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?*

The project does not directly support tribal resiliency.

3) ***Other Benefits:*** *Will the project address water and/or energy sustainability in other ways not described above? For example:*

- *Will the project assist States and water users in complying with interstate compacts?*

The Bear River starts in Utah and then proceeds to go through Idaho and Wyoming before returning back into Utah where it ends at the Great Sale Lake. Although the diversion for the project is located downstream of the Idaho and Wyoming users,

any additional water arriving at the Great Salt Lake helps reduce present tensions between the states and their water needs.

- *Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?*

Yes, this project will benefit the area agriculturally, environmentally, and with safety concerns. It will benefit the agricultural community the most through improved watering conveyance and management systems. The project will aid the environmental sectors reliant on the Bear River, this includes the Great Salt Lake, Cutler Reservoir, the Great Salt Lake Bird Refuge, fisheries, etc. The project will also remove over three miles of open ditches throughout the Benson Community. These ditches are a hazard to vehicle traffic, flooding risk potentials, and drowning.

- *Will the project benefit a larger initiative to address sustainability?*

Yes, within Cache Valley, irrigation companies and districts are moving toward pressurizing canals and moving away from flood irrigation. This initiative will reduce the amount of water that is consumed and needed. This initiative will improve the overall sustainability of resources in the Cache Valley. Flood irrigation is an effective method of farming, however, much of the water that is used is lost due to seepage and evaporation. This initiative is incentivized through the NRCS funding programs and is common throughout the west.

- *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*

Yes, with the current system if a pump breaks or needs repair, large areas of crops will be without water. This could result in a decreased yields and could cause crisis for some farmers. By centralizing the pumps, it will avoid potential water crises.

Additionally, the current system is susceptible to dishonest water users. Due to the lack of measurement devices, it is difficult to monitor the water usage and ensure all shareholders are reviewing their proper usage amounts of water. Often there are disagreements between watering schedules and amounts that hinder watering operations for all users.

2.4 Evaluation Criterion D—*Complementing On-Farm Irrigation Improvements*
*Up to **10 points** may be awarded for projects that describe in detail how they will **complement on-farm irrigation improvements** eligible for NRCS financial or technical assistance.*

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.*

Of the 509 acres of farmland that will be impacted by this project, nearly all of the ground, 87.7%, is flood irrigated. The different types of crops are broken down with their corresponding acreage in Table 9. While flood irrigation is an effective way to water crops, the losses that result from evaporation and seepage are significantly greater than using sprinklers. Many of those who currently irrigate with flood irrigation have, and currently are developing plans to install pivots, hand lines, or wheel lines to irrigate their plots. The future use of pivots, hand lines, or wheel lines instead of flood irrigation will conserve water and decrease the irrigation demand.

Table 9: Crop Summary

Crop Type	Percentage of Project Area	Total Area of Crop (ac)
Alfalfa	42%	214
Corn	37%	188
Grass Hay	12%	59
Small Grain	9%	48
Total	**100%**	**509**

Additionally, with the conserved water and the improved delivery rate from the piped section, farmers will have the ability to alter and improve their watering practices to improve the water usage. Currently, there is rigid schedule that must be followed to provide shareholders their water allotments. Often, watering schedules have to be altered due to water shortfalls or slow delivery rates which restricts how the farmers can utilize the water on their farms. The decrease in water loss and the increase in delivery rate will provide needed flexibility. Farmers will be able to water in more effective ways such as:

- avoiding watering fields in the peak heat periods of the day
- slowly water fields and allowing for deeper water penetration instead of being rushed to use their allotted water in their time frame

- allowing farmers to borrow or trade excess water amongst each other instead of wasting their allotment

The increase in flexibility will help farmers shift from a scarcity mindset to one that uses only what their crops need. With the addition of the meters, the water can be monitored, allowing for trading and shifting of water through the system as farmers alter crop types and trade water with other farmers.

The service connections will be brought to the property lines of the users and will be directly connected to the new on-farm pressurized systems. The majority of the farmers are planning on implementing hand lines or wheel lines are the fields are not shaped conducive to pivots. Figure 2 illustrates which fields are currently watered with sprinkler systems and which ones are planning on adding sprinkler systems and what types.

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

Various farmers that are currently flood irrigating have started to work with the NRCS or plan on working with the NRCS. The other farmers plan to work with the NRCS in the future once the project has been completed and the pressurized system is operational.

- *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.*

Attached in Appendix A are the commitment/ support letters for the project from the various shareholders. These letters also indicate their commitment to pursue NRCS assistance in completing on-farm improvements. These letters consist of ?? % of the flood irrigators on the system.

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

Located in Appendix A are various letters of intent/support of implementing pivots or wheel lines where flood irrigation is currently being used.

- *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?*

With the piping and pressurizing of the King Ditch and the Reese & Clark Ditch, pressurized water will be delivered to the property line of all shareholders. Irrigation

connections will be made to the main pipeline using two gate valves and a flow measuring device. Each meter will have the necessary output abilities that will allow irrigators to evaluate their water usage closer and determine when and how water can be conserved. This control ability is currently not possible with the existing system.

The central pressurized system will facilitate the development of on-farm sprinkler systems; including: pivots, hand lines, wheel lines, and drip systems where applicable.

Additionally, with the piping of the King Irrigation and Reese & Clark Irrigation systems, the decrease of water losses, and increase of water delivery, the tight restricting watering schedule can be relaxed. By relaxing the watering schedule, shareholders utilizing the system can update their watering practices to conserve water. One such improvement to watering practice would be to implement automatic sprinkler systems in connection with the main line to further control on-farm application rates This would decrease the amount lost on the farm due to evaporation/ seepage and increase the efficiency of water use on the farms.

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

The conveyance system will be taken from an open ditch system to a full pressurized system which is considered to be the most effective conveyance system. The on-farm fields are primarily irrigated using flood irrigation methods. The respective owners of these fields have stated that they are committed to installing pivots or wheel lines to irrigate their fields after the completion of the proposed project. With the switch from flood irrigation to sprinkler irrigation, less water will be lost to seepage and evaporation while watering the crops. This reduction in water loss will increase the water use efficiency for the area. The relaxed water schedules will also help in increasing the efficiency of the on-farm watering practices as it will allow for flexible watering practices instead of rushed methods that waste water.

- *Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work*

  - *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.*

One goal of the proposed project is to provide the opportunity for local farmers to implement on-farm water conservation measures. The switch from flood irrigation to sprinkler irrigation aids in the conservation of water within individual irrigation systems. Flood irrigation allows water to sit on the surface of the land for long durations of time. During these periods of time, large amounts of water are lost due to seepage and evaporation. With the switch to sprinkler irrigation, water is applied in a

manner that aids in the elimination of water loss due to seepage and evaporation. The majority of the water applied using sprinkler irrigation is used by the crop itself instead of being lost due to seepage and evaporation.

Presently 87.7% of the project acreage is flood irrigated. The respective owners of these fields have stated their intentions to implement on-farm improvements such as installing sprinkler systems. The National Engineering Handbook published by the United States Department of Agriculture in the Irrigation Guide Section identifies efficiency rates of various on-farm irrigation methods. It states that flood irrigation ranges between 50% and 80% efficient dependent on the soil types and type of leveling. Based on the current leveling practices and soil compositions, it has been estimated that the current flood watering methods are on average 65% effective. The Irrigation Handbook also identifies the efficiency rates of various sprinkler systems including handlines, wheel lines, and pivots; 60% to 95% effective. With the new central system and new on-farm improvements properly designed it is anticipated to see 85% efficiency rates.

With the fields presently receiving 1,141.5 acre-feet of water (system demand minus water losses) it is projected that the conversion of the flood irrigated fields to sprinkler systems will yield a water savings of 200.22 acre-feet of water.

Calculation Ran:

$$Delivered\ Water * Flood\ Acreage * Efficiency\ Increase = Water\ Savings$$

$$1{,}141.5\ (ac-ft) * 87.7\% * (85\% - 65\%) = 200.22\ (ac-ft)$$

- *Please provide a map of your water service area boundaries. If your project is selected for funding under the FOA, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.*

A depiction of the area serviced by these Companies currently is included in Figure 2 and the future system is depicted in Figure 4. A map of the anticipated on-farm projects is presented in Figure 8.

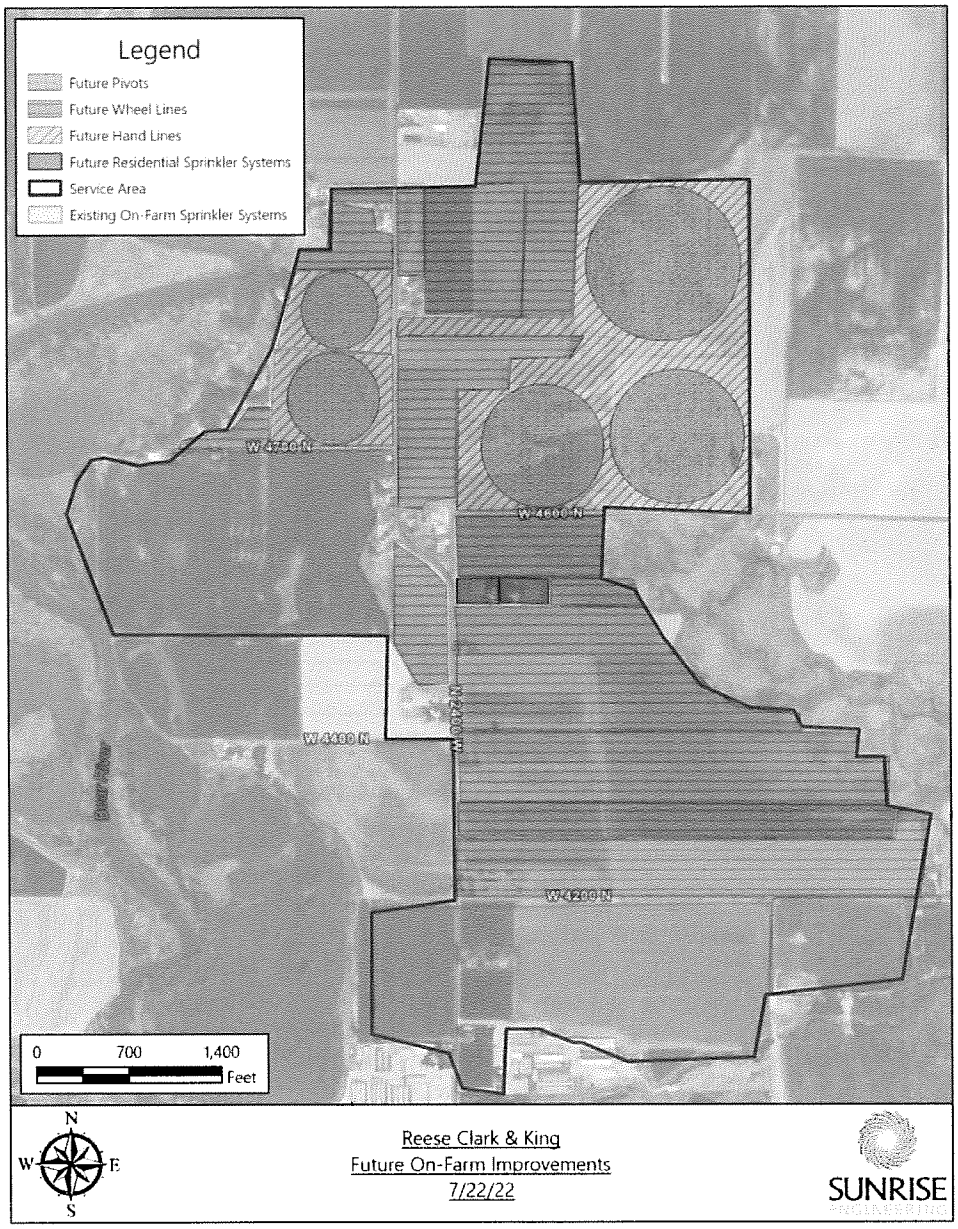

Figure 8: Future On-Farm Improvements

2.5 Evaluation Criterion E—*Planning & Implementation*

Up to 8 points may be awarded for these subcriteria

2.5.1 Subcriterion E.1— *Project Planning*

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study?

Provide the following information regarding project planning:

- *Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.*

This project is supported by the Cache Water District Water Master Plan. Within this plan it has a section on improving irrigation systems. The Cache Water District states that they plan to work with irrigation companies to improve system-wide efficiency. They plan to do this through the lining or piping of canals among other things.

- *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).*

Within the state of Utah, there is a large push to meter all secondary irrigation connections. Currently only 15% of secondary connections are metered. To prove Utah's determination to conserve water, they passed HB 242 bill stating that all secondary connections need to be metered by 2030. This effort is done to conserve any water that the state can. This project will meter all connections on the system. Additionally, a study on the Bear River Basin for the state indicates the goal to conserve water through agricultural improvements.

- *If applicable, provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed WaterSMART Basin Study or Water Management Options Pilot (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes)*

There are two studies that outline strategies to conserve water and other resources. The first is the Bear River Basin Plan. Applicable sections are included in Appendix C. This plan urges municipalities and companies to find ways to increase water delivery efficiency. It also explains ways to conserve water in times of drought. There are no WaterSMART Basin Studies that cover the area involved in this project.

2.5.2 Subcriterion E.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.

Applicants that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- *Identify and provide a summary description of the major tasks necessary to complete the project. Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.*

This project will be broken down into ten separate phases. The different phases are as follows with a brief description of what the phase will entail:

1) Project Funding
    a. Application and Securement of BOR WaterSMART Grant
    b. Application and Securement of Utah AG Optimization Grant
    c. Application and Securement of Utah Division of Water Resources Loan
2) Environmental Clearances
    a. Cultural Review and Approvals
    b. Environmental Review and Approvals (CE, EA, or EIS)
    c. Stream Alteration Permit
3) Topographic Survey and Base Mapping
    a. Collection of Field Data
    b. Collection of Topography Data
    c. Mapping of Property Lines and Easements
4) Irrigation System Design
    a. Design Report
        i. Finalizing Pipe Sizes
        ii. Finalizing Service Connection Location and Sizes
    b. Pump Station Design
    c. Pipeline Design
    d. Book of Specifications Development
5) Permitting
    a. Cache County Conditional Use Permit and Encroachment Permits
    b. Water Right Application for New Point of Diversion
    c. Storm Water Pollution Prevention Permit
6) Materials Procurement
    a. Secure and Purchase Large Items
7) Contractor Procurement
    a. Select and Contract with Local Competent Contractor
8) Construction
    a. Construction Pump Station

b. Install Pipe
c. Connect Service Connections to existing on-farm systems

9) Project Start Up
   a. Pressurize System and Inspect for Deficiencies
   b. Cycle Pumps and Valves

10) Project Close Out
   a. Complete Final Funding Reports
   b. Perform Operation and Maintenance Training
   c. Turn Completed System Over to Irrigation Companies for Operation

Figure 9 shows a breakdown of how long each phase will take. The different tasks that are associated with each phase are included as well. It is estimated that this project will take 22 months.

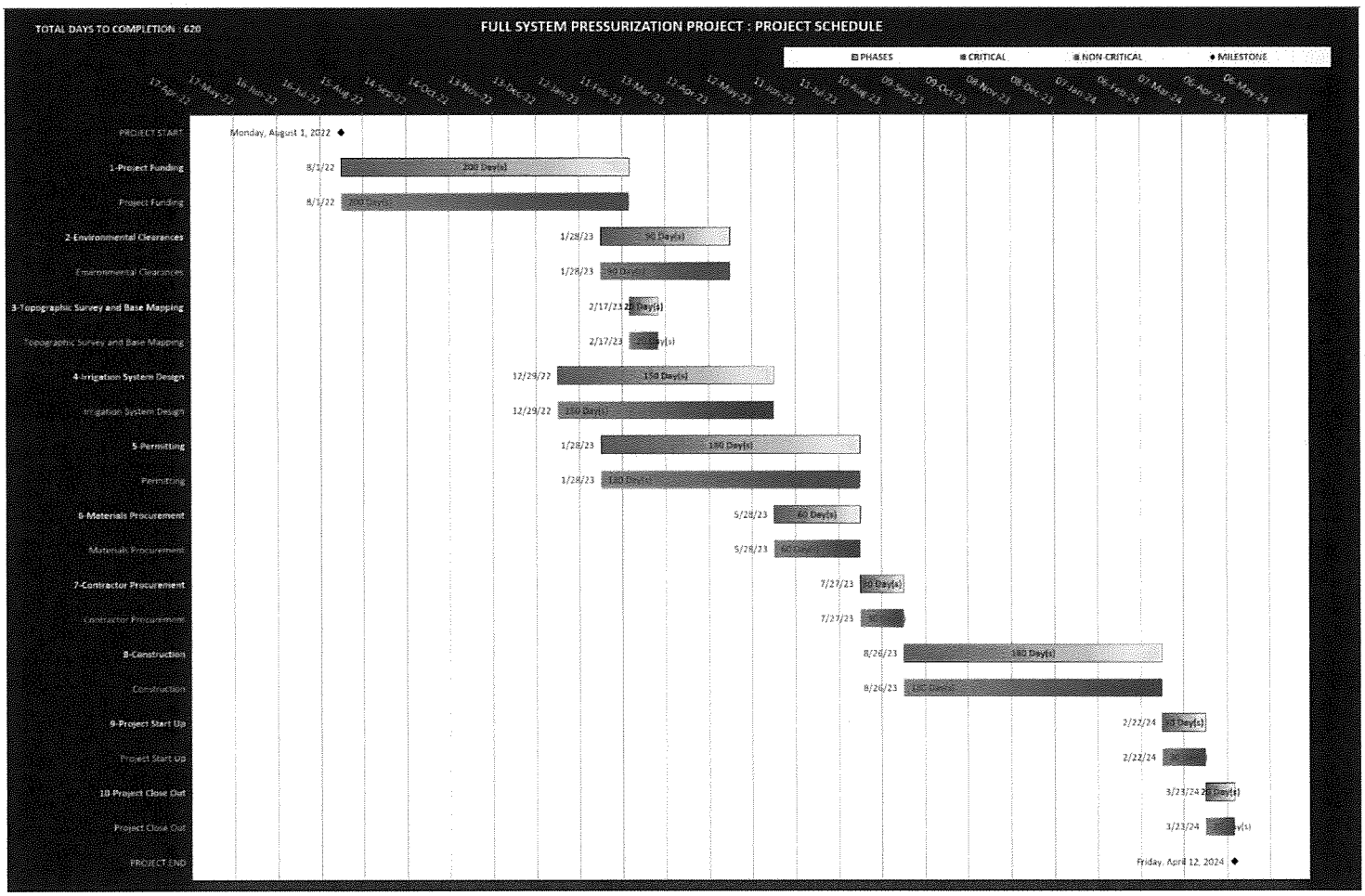

Figure 9: Project Schedule

- *Describe any permits that will be required, along with the process for obtaining such permits.*

  Various permits will be required for this project. The permits and the general process for their approval are listed below:

  - Cache County Conditional Use - this permit requires an application and a meeting in which plans, easements, and documentation for use are needed.

  - Cache County Encroachment Permit – the permit is completed by the selected contractor and is for crossing roads and working in the county right of way. It is a routine permit and only requires an engineered plan set.

  - Water Right Point of Diversion Shift – this permit allows for the King Irrigation Company's water and the Reese & Clark Irrigation Company's water to be utilized and pulled from the Bear River at the same location. The application is simple and takes about 3 months for review and finalization.

  - Storm Water Pollution Prevention Plan – this permit requires an application and a special storm water prevention plan set. The plan set will be provided by the Engineer, but the full permit will be obtained by the Contractor at the time of construction. The permit is routine.

  - Stream Alteration Permit – this permit requires an application to the Army Corp of Engineers. The plan set developed for the project will be sufficient for the application. This permit will be secured earlier in the project.

- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*

Sunrise Engineering has prepared a hydraulic water model of the pipe network, evaluated pump sizing, pumping energy cost evaluations, performed seepage calculation with regards to the soil types, and conducted preliminary environmental reviews. With the project funded, Sunrise Engineering will provide a full design and assist with permits, funding needs, construction assistance and management, and final project close out.

- *Describe any new policies or administrative actions required to implement the project.*

The Companies have proposed to update bylaws allowing shareholders to be charged a different rate depending on the lateral or section of the canal their shares are located on and for power used by the pumps.

- *Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete). Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation Regional or Area Office?*

Figure 9 shows a detailed project schedule with estimated length of time to perform tasks. Additionally, in the beginning of this Section 2.5.2 is a list of descriptive milestones for the project. The expected timeline has been sent to the local Reclamation Regional.

2.6 Evaluation Criterion F—*Collaboration*

Up to 6 points may be awarded for projects that promote and encourage collaboration among parties in a way that helps increase the sustainability of the water supply.

Please describe how the project promotes and encourages collaboration. Consider the following:

- *Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?*

There is support for this project from multiple organization and many shareholders. Listed below are the various supporters and their roles:

Shareholders are important to this project as they are farmers with decades of experience. They have that knowledge will be a great benefit to the project and should be taken into consideration. They are also the end users and will inherit the system once completed for operation and maintenance. They will be involved at every step of this project.

Cache Water District provides a wealth of knowledge and expertise. Their support will provide suggestions on how to best finish this project in a cost-effective and efficient manner.

NRCS will be vital for On-Farm Improvements, they will work closely with farmers as they transition from flood irrigation to sprinkling.

The Utah Division of Water Resources (DWRe) is in full support of the project and will evaluate the funding of it through a low interest loan. They often fund projects such as this and will evaluate the costs and benefits and help the shareholders make this project a reality in connection with this grant.

Cache Water District is in support of this project as is NRCS. Multiple shareholders have penned their support of the project. NRCS will support this project through the on-farm improvements in assisting farmers with their transition to pressurized sprinkling irrigation. The Division of Water Resources is also in support of this project as it encourages wise water usage.

Most notable is the mutual support of the King Irrigation Company and the Reese & Clark Irrigation Company working together to completer this project. Both companies have come together to complete this joint venture to benefit both of their shareholders while reducing the financial burden by being joint owners in this project.

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

The support of the shareholders is the driving force for the project. They are the ones, along with boards of the King and Reese & Clark Irrigation Companies, who have requested this project. Without their support, this project would not exist. They have been working together to bring this application together and are excited for this opportunity.

The support of the DWRe in connection with the Bureau will provide the majority of the funding for the project. The two companies and shareholders will be providing a percentage of the financial support, but the majority will be shared between the Bureau and the DWRe. Without the support of the DWRe and the Bureau, this project cannot become a reality at this time.

The support of the NRCS is crucial to take the benefits of the centralized system to the end user. The proposed project is the backbone to which all the individual farmers will connect to upgrade their individual farms. Their support will finish the system and provide the greatest benefit to the end users.

The support of the Cache Water District provides experience and council when exploring options for metering and system design. They are also involved with legislation and understand the needs outside of the direct benefits to the shareholders and can help guide the project to produce the most widespread benefit.

- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*

Yes, this project will increase the likelihood of conservation improvements by other water users. With the central backbone in place, others currently not a part of the project will have the option to connect on to the system to provide irrigation water to their farms and lands as appropriate with available capacities and water rights. Additionally, as farms may be developed, shares can be used to provide for

residential watering thus relieving the watering burden from the culinary systems. Studies in Utah have shown that by metering connections consumption has been reduced to by up to 30%. This decrease in water usage will benefit everyone that relies on the system for water.

- *Please attach any relevant supporting documents*

All letters of support and letters of commitment are in Appendix A

2.7 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 using the following calculation:*

$$\frac{\textbf{Non - Federal Funding}}{\textbf{Total Project Cost}} = \frac{\$1,270,000}{\$2,270,000} = 56\%$$

2.8 Evaluation Criterion H— *Nexus 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.*

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider:

- *Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?*

King Irrigation Company and Reese & Clark Irrigation Company currently do not have a contract of any sort with Reclamation.

- *If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?*

King Irrigation Company and Reese & Clark Irrigation Company do not receive Reclamation Water.

- *Will the proposed work benefit a Reclamation project area or activity?*

Yes, the proposed project is located in the Bear River Basin. Various projects have been completed through the Reclamation in the Bear River Basin. Below is a brief list of some of the projects.

- Newton Lateral Piping Project (completed)
- North and South Litz Canal Piping (in progress)
- South Fields Earthen Canal Piping Project (completed)
- Hansen and Ezola Piping Project (completed)
- Quarter Circle Drive Section (completed)
- Newton Water Users Piping Project (completed)
- Newton Dam Outlet Project (completed)
- Benson Canal Enclosure (completed)

- *Is the applicant a Tribe?*

The Applicant is not a Tribe.

3 – Performance Measures

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

The Companies will be able to measure performance three ways:

1) reduction of consumption by users due to metering
2) reduction of energy costs due to increased energy efficiency
3) reductions in water lost during water conveyance

Meters will communicate with the two irrigation companies informing them of user water consumption. This will allow for accurate tracking of water consumption throughout the entire system. The Companies will be able to encourage water conservation and ensure shareholders are only using their allotted amounts of water. Once amounts of consumption are known throughout the new system it can be compared to older information and determined how much water is saved.

Energy efficiency improvements will be quantified by comparing past records of electrical demands from each pump to the electrical demand of the new pumps. This electrical demand will be divided by the acreage that is supplied water to determine how much energy is require on a per-acre basis. Another measure that will be used is comparing the costs before and after the project of pumping. Inflation will be accounted for to ensure accurate representation of savings.

The reduction of water loss during water conveyance will be measured by comparing historic demands by both companies after the completion of the project. This is made possible by installing flow meters throughout the system. The internal telemetry system at the pump station

will provide information of water entering the system. Meters at each connection will provide the volume leaving the system allow for losses to be calculated.

4 – Project Budget

The project budget includes:

1. *Budget proposal*
2. *Budget narrative*
3. *Funding plan and letters of commitment*
4. *Pre-Award Costs*

Project costs for environmental and cultural compliance and engineering/design that were incurred or are anticipated to be incurred prior to award should be included in the proposed project budget.

4.1 Budget Proposal

The total project cost is the sum of all allowable items of costs, including all required cost sharing and voluntary committed cost sharing, including third-party contributions, that are necessary to complete the project. Please include the following chart (Table 1) to summarize all funding sources. Denote in-kind contributions with an asterisk (*).

The budget proposal is broken down in Table 10:

Table 10: Total Project Cost

CONTRACTUAL COSTS	AMOUNT	
Engineering	$	285,000
Legal Consultation	$	25,000
Environmental	$	10,000
Material & Contractor Procurement	$	1,950,000
Total Contractual Costs	**$**	**2,270,000**
SOURCES	**AMOUNT**	
Costs to be reimbursed with the requester Federal funding	$	1,000,000
Costs to be paid by the applicant	$	770,000
Costs to be reimbursed by UDAF Grant	$	500,000
TOTAL PROJECT COST	**$**	**2,270,000**

The two companies plan on applying for a Water Optimization Grant from the State of Utah's Agriculture and Food department to move forward with the Full System Pressurization Project. This application will open in the beginning of August. In working with the program manager for this funding avenue, they are looking forward to this application. The Utah Division of Water Resources (DWRe) has also stated their support in funding this project via loan; the support letter is attached in Appendix A. A preliminary engineering analysis has been conducted to

determine potential pipe sizes and pipe lengths, pump station location, and the number of irrigation connections. The preliminary analysis was also used to determine the cost of the project. The results of this analysis can be seen in Tables 8 & 10 and Figure 4. All work is anticipated to be completed by contractors and consultants at this point.

With funding secured from Utah's Division of Water Resources loan, Utah Department of Agriculture and Food grant, and the WaterSMART grant, a full engineering design will be done. A design of the pump station and piping for the main canal will be completed by a professional engineering firm (Sunrise Engineering) to ensure proper design and safety considerations. The design will be in accordance with industry design standards as well as design standards set forth by the Natural Resources Conservation Service (NRCS).

4.2 Budget Narrative

Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The budget narrative provides a discussion of, or explanation for, items included in Section B of the SF-424A. The types of information to describe in the narrative include, but are not limited to, those identified in the Budget Narrative Guidance attached to this NOFO. Applicants may elect to use the Budget Detail and Narrative spreadsheet for their budget narrative (see attached). Costs, including the valuation of third-party in-kind contributions, must comply with the applicable cost principles contained in 2 CFR Part §200.

4.2.1 - Personnel

This category includes salaries and wages of employees of the applicant organization that will be working directly on the project. Recommend reviewing §200.430 Compensation - personal services for more information on the specific requirements regarding compensation costs, including the Standards for Documentation of Personnel Expenses at §200.430(i).

Personnel, salaries, and wages are included in Contractual Costs. With the Contractual Costs, the budgeted amounts have been broken down to personnel (Fee Schedule) where applicable. These cost break downs are included in Appendix D – Engineers Opinion of Probable Costs.

4.2.2 - Fringe Benefits

Fringe benefits are allowances and services provided by employers to their employees as compensation in addition to regular salaries and wages. Fringe benefits include, but are not limited to, the costs of leave (vacation, family-related, sick or military), employee insurance, pensions, and unemployment benefit plans. Fringe costs should also include employer contributions required by law such as payroll taxes such as FICA, unemployment, and workers compensation. Fringe does ***not*** *include federal income taxes, employee portion FICA, or other such costs. Recommend reviewing §200.431 Compensation - fringe benefits for more information on the allowability and allocability of fringe benefits. Note: Car allowances and cars furnished*

to employees for personal and work use are unallowable as a fringe benefit, regardless of whether the costs is reported as taxable income, and must be excluded from fringe benefit rates.

Fringe Benefits are not identified specifically in this budget. All compensation for employees are included in their Contractual Costs and proposed fee schedules. An estimation of these costs and fees are included in Appendix D.

4.2.3 - Travel

Travel costs are expenses incurred by personnel in the performance of project activities. Costs can be charged on an actual cost basis, on a per diem or mileage basis in lieu of actual costs incurred, or on a combination of the two, provided that the method used is applied to the entire trip and not to selected days of the trip. All charges must be consistent with those normally allowed under similar circumstances for non-Federally funded activities and any established travel policies. Recommend reviewing §200.475 Travel costs for more information.

Travel Costs will not be necessary for the completion of this project. Any travel costs incurred will be included in Contractual Costs.

4.2.4 - Equipment

Equipment is defined in §200.1 as tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the applicant organization for financial statement purposes, or $5,000. Recommend reviewing §200.439 Equipment and other capital expenditures for additional information on the allowability of equipment costs and §200.313 Equipment for information regarding the title, use, management and disposition requirements for equipment acquired under a Federal award.

Equipment Costs are included in Contractual Costs. Documentation of all contracts incurred during the project will be properly documented as required and will be made available upon request.

4.2.5 – Materials and Supplies

Supplies are defined in §200.1 as all tangible personal property other than those described in the definition of equipment. A computing device is a supply if the acquisition cost is less than the lesser of the capitalization level established by the applicant's organization for financial statement purposes or $5,000, regardless of the length of its useful life. Recommend reviewing §200.453 Materials and Supplies Costs, Including the Costs of Computing Devices, regarding the allowability of costs. Supply items must be direct costs to the project and not duplicative of supply costs in the indirect rate. For post-award requirements regarding supplies, recommend reviewing §200.314 Supplies. For financial management requirements related to supplies, recommend reviewing §200.302(b)(4).

Materials and Supplies are included in Contractual Costs. Documentation of all contracts incurred during the project will be properly documented as required and will be made available upon request.

4.2.6 - Contractual

Include all contracts and subawards. Per §200.1, a contract means, for the purpose of Federal financial assistance, a legal instrument by which a recipient or subrecipient purchases property or services needed to carry out the project or program under a Federal award. The term as used in this part does not include a legal instrument, even if the non-Federal entity considers it a contract when the substance of the transaction meets the definition of a subaward.

There will be five contracts acquired to complete the Full System Pressurization Project.

1) Engineering Contract
2) Legal Contract
3) Environmental Contract
4) Material and Contractor Procurement Contract

The Engineering Contract will be obtained to ensure that proper safety and design considerations are made. The engineering firm will also have the proper experience and credentials to verify the proper steps are made to finish this project safely, on time, and on budget. The Engineering Contract will include multiple services such as survey data, design of the pipeline and pump station, project management, construction management, permitting, bidding assistance, funding procurement and management.

The second contract needed for this project is the Legal Contract. This contract is necessary for the Utah Division of Water Resources Water Savings Loan. This loan will require the legal expertise that will be acquired through the Legal Contract.

The third contract that will be required is the Environmental Contract. This will provide the services necessary to remain in compliance with the National Environmental Policy Act (NEPA). This contract will identify any floral or fauna within the project area that is endangered or threatened. Additionally, this contract will include the cultural resource survey required. Once these services are completed the project can move forward without the fear of harming threated flora or fauna or natural/ cultural resources.

The final contract that will be needed is the Material and Contractor Procurement Contract. Under this contract, meter and pipe will be purchased and delivered to the job site. This contract will also provide the means for the installation of the proposed pipeline. It will also construct the pump station with the necessary electrical components. The Contractor Procurement Contract encompasses the construction of this project.

Funding for the project will be used to pay for contractors, construction material, engineering consultants, environmental consultants, and attorney consultation. This includes construction,

engineering, environmental, and legal services. The costs for the various contracts are included in Appendix D. They are also explained in the following Funding Plan section.

4.2.7 - Construction

Construction costs are costs incurred in the construction, renovation, and/or equipping of a facility or structure. Costs include engineering, design, permitting, demolition, acquisition of materials, and installation of improvements.

At this point in the project, the applicant does not anticipate work to be completed from a third-party contributor.

4.2.8 - Other

This category contains items not included in the previous categories, such as third-party in-kind contributions, tuition remission, rental costs, etc. Third-party in-kind contributions are all services and donations made to the project that do not involve a payment or reimbursement and represent donated items or services that are necessary to the performance of the project. This includes services provided by project partners that will not be reimbursed, volunteer hours, donated equipment, donated existing supplies, etc.

There are no other expenses that have not been accounted for in the previous sections and previous budgets.

4.2.9 - Indirect Costs

Indirect costs that will be incurred during the development or construction of a project, which will not otherwise be recovered, may be included as part of the applicant's project budget. Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the applicable cost principles for the recipient's organization as described below. It is not acceptable to simply incorporate indirect rates within other direct cost line items.

There are no Indirect Costs associated with this proposed project.

4.2.10 - Totals

All project costs are detailed in the opinion of engineering cost found in Appendix D. Personnel, equipment, supplies, and construction are all included within contractual costs. Fringe benefits, travel, and other costs are not applicable for the current budget. Table 11 provides a detailed breakdown and summary of the total estimated project costs.

Table 11: Total Project Cost Breakdown

Budget Item Description	Computation		Quantity Type	TOTAL COST
	$/Unit	Quantity		
Salaries and Wages				
Included within Contractual	N/A	N/A	N/A	$ -
Fringe Benefits				
Included within Contractual	N/A	N/A	N/A	$ -
Travel				
Included within Contractual	N/A	N/A	N/A	$ -
Equipment				
Included within Contractual	N/A	N/A	N/A	$ -
Supplies and Materials				
Included within Contractual	N/A	N/A	N/A	$ -
Contractual/Construction				
Engineering Professional Services	Refer to Appendix D			$ 285,000
Construction	Refer to Appendix E			$ 1,950,000
Environmental	Refer to Appendix F			$ 10,000
Legal Professional Services	$25,000	1	Lump Sum	$ 25,000
Other				
Not Applicable for Current Budget	N/A	N/A	N/A	$ -
Total Direct Costs				**$ 2,270,000**
Indirect Costs				
Not Applicable for Current Budget	N/A	N/A	N/A	$ -
Total Project Costs				**$ 2,270,000**

4.3 Funding Plan & Letters of Commitment

The total project cost is the sum of all allowable items of costs, including all required cost sharing and voluntary committed cost sharing, including third-party contributions, that are necessary to complete the project. Please include the following chart to summarize all funding sources. Denote in-kind contributions with an asterisk (*).

The funding plan for the project is as follows:

- 5.1 % from King Irrigation Company and Reese & Clark Irrigation Company (50/50): $ 115,000
- 22.0 % from Utah Department of Agriculture and Food Grant: $ 500,000
- 29.27 % Utah Division of Water Resources Loan Paid by the Companies: $ 655,000
- 44.1 % Bureau of Reclamation WaterSMART Grant: $ 1,000,000

Provided in Appendix A are a series of support letters from the Reese & Clark Irrigation Company (Commitment Letter), the Division of Water Resources, NRCS, the Cache Water District, Shareholders from the King Irrigation Company, and Shareholders from the Reese & Clark Irrigation Company. The Utah Department of Water Resources Loan will be borrowed at 0% interest. The loan will be approved and awarded at a Utah Water Resources Board meeting. The DWRe board often funds these types of projects and there is very little concern about being funded through them. Table 12 shows a summary of funding sources with their corresponding amounts.

Table 12: Summary of Non-Federal Funding

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
UDAF Water Optimization Grant	$500,000
DWRe Water Savings Loan	$655,000
Company Contributions	$115,000
Non-Federal Subtotal	**$1,270,000**
REQUESTED RECLAMATION FUNDING	**$1,000,000**

Letters of Support are included in Appendix A. An Official Resolution is included in Appendix G.

4.4 Pre-Award Costs

The cost to be incurred before the award date will be the cost by the applicant to put together this application. This cost will not be requested to be reimbursed. Other costs that may be incurred before the data of award are pre-design costs, permitting, and water right work. This work will be requested to be reimbursed as appropriate. These pursuits will help keep the project on pace to finish before the irrigation season of 2024.

5 - 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 should consider 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. The application should include the answers to:

- *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.

The proposed project will cause minimal amount of disturbance to the environment. It will disturb the earth by digging down to install pipe and the pump station. A Storm Water Pollution Prevention Plan (SWPPP) will be acquired before construction begins. This plan will ensure that excess amounts of dust or debris are not produced from construction. No endangered or threaten animal habitats will be encroached on during the construction of this 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?*

An IPaC evaluation was done as a preliminary assessment of the areas endangered and threatened species. This report indicates that within the project area there are no critical habitats. The companies will do an official Environmental Report of the Flora and Fauna within the project area. This will inform the companies if there are any critical habitats that need to be protected.

- *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.*

There are no wetlands or other surface water that will be impacted by this project. The canals within this project do not fall under CWA jurisdiction as "Water of the United States" The new pump station will be replacing two old pump stations and will not be an issue along the Bear River.

- *When was the water delivery system constructed?*

The King Irrigation Company pump house and canals were first constructed in 1924. More canals have been added to the system since. Reese & Clark Company's first canals and pump house were built in the 1960's.

- *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.*

This project will convert 15,500 feet of canals to 12,000 feet of PVC pipeline. The first canal was constructed in 1924. The King Pump was most recently replaced 55 years ago. The Reese & Clark canals were first constructed in the 1960's

- *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.*

There are no buildings, structures, or features that are eligible for the National Register of Historic Places to the applicant's knowledge.

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

The are no archeological sites within the proposed project area to the applicants knowledge. A cultural survey will be done on the project area that will identify archeological sites.

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

No, the project will not have an adverse effect on low income or minority populations.

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

The project will not limit access to ceremonial use of Indian sacred sites or impact tribal lands.

- *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?*

This project will not contribute or introduce the spread of noxious weeds.

6 - Required Permits or Approvals

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

Note that improvements to Federal facilities that are implemented through any project awarded funding through this NOFO must comply with additional requirements. The Federal government will continue to hold title to the Federal facility and any improvement that is integral to the existing operations of that facility. Please see P.L. 111-11 §9504(a)(3)(B). Reclamation may also require additional reviews and approvals prior to award to ensure that any necessary easements, land use authorizations, or special permits can be approved consistent with the requirements of 43 CFR §429 and that the development will not impact or impair project operations or efficiency.

There will be five permits that will be acquired to finish this project. The permits are:

1) Cache County Conditional Use Permit
2) Cache County Encroachment Permit
3) Water Right Point of Diversion Shift Change Application
4) Storm Water Pollution Prevention Plan (SWPPP)
5) Environmental Clearance
6) Stream Alteration Permit (USACE)

- Cache County Conditional Use - this permit requires an application and a meeting in which plans, easements, and documentation for use are needed. This will be applied for early on to ensure all conditions are met. Anticipated Application Date is March of 2023.

- Cache County Encroachment Permit – the permit is completed by the selected contractor and is for crossing roads and working in the county right of way. It is a routine permit and only requires an engineered plan set. This permit will be filed for at the time of construction.

- Water Right Point of Diversion Shift – this permit allows for the King Irrigation Company's water and the Reese & Clark Irrigation Company's water to be utilized and pulled from the Bear River at the same location. The application is simple and takes about 3 months for review and finalization. This application is anticipated to be made in March of 2023 to ensure early securement.

- Storm Water Pollution Prevention Plan – this permit requires an application and a special storm water prevention plan set. The plan set will be provided by the Engineer, but the full permit will be obtained by the Contractor at the time of construction. The permit is routine. This permit will be filed for at the time of construction.

- An environmental clearance permit will be required before construction can begin. This will be acquired from a Environmental Agency. Preliminary research with the Historic Places and National Wetlands Inventory and the Information for Planning and Consultation (IPaC) suggests that there are no apparent areas to be concerned with at this time. This will be verified. Additionally, a cultural resources review will be conducted. All data will be submitted to the bureau for review and acceptance. This is anticipated for completion by June of 2023.

- A Stream Alteration Permit will need to be obtained to install the new pump station in place of the old pump stations. Any work within the riparian area of a natural stream is required to work with the Army Corp of Engineers to ensure the natural water way is protected. Since this project is replacing two old pump stations with significant issues with new pump station, its expected that the permitting will go smoothly. The permit is anticipated to acquired in April 2023.

7 - Overlap or Duplication of Effort Statement

Applicants must provide a statement that addresses if there is any overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel. If any overlap exists, applicants must provide a description of the overlap in their application for review.

Applicants must also state if the proposal submitted for consideration under this program does or does not in any way duplicate any proposal or project that has been or will be submitted for funding consideration to any other potential funding source—whether it be Federal or non-Federal. If such a circumstance exists, applicants must detail when the other duplicative proposal(s) were submitted, to whom (Agency name and Financial Assistance program), and when funding decisions are expected to be announced. If at any time a proposal is awarded funds that would be duplicative of the funding requested from Reclamation, applicants must notify the NOFO point of contact or the Program Coordinator immediately.

There are no overlapping or other project that would create a duplication of effort that are planned or are being constructed that would impact the proposed project to the knowledge of the applicant.

8 - Conflict of Interest Disclosure Statement

Conflict of Interest Disclosure Per the Financial Assistance Interior Regulation (FAIR), 2 CFR §1402.112, you must state in your application if any actual or potential conflict of interest exists at the time of submission.

Applicability

This section intends to ensure that non-Federal entities and their employees take appropriate steps to avoid conflicts of interest in their responsibilities under or with respect to Federal

financial assistance agreements. In the procurement of supplies, equipment, construction, and services by recipients and by subrecipients, the conflict-of-interest provisions in 2 CFR §200.318 apply.

There are no actual or potential conflict of interest at the time of submission. King Irrigation Company agrees to maintain oversight of contractor's performance in accordance with the terms and conditions of the contract and best practices.

Notification

Non-Federal entities, including applicants for financial assistance awards, must disclose in writing any conflict of interest to the DOI awarding agency or pass- through entity in accordance with 2 CFR §200.112. Recipients must establish internal controls that include, at a minimum, procedures to identify, disclose, and mitigate or eliminate identified conflicts of interest. The successful applicant is responsible for notifying the Financial Assistance Officer in writing of any conflicts of interest that may arise during the life of the award, including those that have been reported by subrecipients.

There are no actual or potential conflicts of interest at the time of submission. If a conflict of interest arises, King Irrigation Company will handle the situation appropriately and then notify the financial assistance officer in writing.

Restrictions on Lobbying

Non-Federal entities are strictly prohibited from using funds under a grant or cooperative agreement for lobbying activities and must provide the required certifications and disclosures pursuant to 43 CFR §18 and 31 USC §1352.

King Irrigation Company agrees that no grant funding will be used for lobbying activities.

Review Procedures

The Financial Assistance Officer will examine each conflict of interest disclosure on the basis of its particular facts and the nature of the proposed grant or cooperative agreement, and will determine whether a significant potential conflict exists and, if it does, develop an appropriate means for resolving it. Enforcement. Failure to resolve conflicts of interest in a manner that satisfies the government may be cause for termination of the award. Failure to make required disclosures may result in any of the remedies described in 2 CFR §200.339, Remedies for noncompliance, including suspension or debarment (see also 2 CFR §180).

King Irrigation Company and Reese & Clark Irrigation Company are prepared to readily assist in the review process as they understand the importance of the process.

9 - Letters of Support

Please include letters from interested stakeholders supporting the proposed project. To ensure your proposal is accurately reviewed, please attach all letters of support/partnership letters as an appendix. Letters of support received after the application deadline for this NOFO will not be considered in evaluating your proposed project. These letters do not count within the 100 page maximum.

Letters of support for the project are attached in Appendix A. Appendix A includes Letters of Support from the following individuals or groups:

- Reese & Clark Irritation Company Commitment Letter: Craig Munk
- Department of Natural Resources – Division of Water Resources: Marias Egbert
- Local NRCS Office: Emily Fife
- Cache Water District: Nathan Daugs
- King Irrigation Company Shareholders in support of on-farm improvements that will result from the project
- Reese & Clark Irrigation Company Shareholders documenting their support of the project and on-farm improvements

10 - Official Resolution

Include an official resolution adopted by the applicant's board of directors or governing body, or, for State government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of a financial assistance award under this NOFO, verifying:

- *The identity of the official with legal authority to enter into an agreement*
- *The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted*
- *That your organization will work with Reclamation to meet established deadlines for*
- *entering into a grant or cooperative agreement*

An official resolution meeting the requirements set forth above is mandatory. If you are unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted to sha-dro-fafoa@usbr.gov up to 30 days after the application deadline. This resolution does not count within the 100 page maximum for the application.

An official resolution meeting the criteria set forth above will be signed and submitted to the Bureau of Reclamation within the allotted 30 days permitted after the application deadline. A draft copy of the resolution has been attached in Appendix G.

11 - Unique Entity Identifier and System for Award Management (SAM)

11.1 Register with the System for Award Management

Register on theSAM.gov website. "Help" tab on the website contains User Guides and other information to assist you with registration. TheGrants.gov Register with SAM page also provides detailed instructions. You can also contact the supporting Federal Service Desk for help registering in SAM. Once registered in SAM, entities must renew and revalidate their SAM registration at least once every 12 months from the date previously registered. Entities are strongly encouraged to revalidate their registration as often as needed to ensure their information is up to date and reflects changes that may have been to the entity's IRS information.

Reclamation will not make a Federal award to an applicant until the applicant has complied with all applicable Unique Entity Identifier (UEI) and SAM requirements and, if an applicant has not fully complied with the requirements by the time the Reclamation is ready to make an award, Reclamation may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

Federal award recipients must also continue to maintain an active SAM.gov registration with current information through the life of their Federal award(s). See the "Submission Requirements" section of this document below for more information on SAM.gov registration.

There is no cost to register with SAM.gov. There are third-party vendors who will charge a fee in exchange for registering entities with SAM.gov; please be aware you can register and request help for free.

The Company is currently registered with SAM, under DUNNS number 072801738. The King Irrigation Company will maintain the proper registrations. The King Irrigation Company is currently registered with SAM, under UEI number TEM7BSQQMS34. Historically the DUNNs number for the King Irrigation Company is 072801738. The applicant will maintain a SAM registration as required.