

# **FUNDING OPPORTUNITY ANNOUNCEMENT No. BOR-DO-18-F009**

## **WATERSMART GRANTS: SMALL-SCALE WATER EFFICIENCY PROJECTS FOR FISCAL YEAR 2018**

### **APPLICANT:**

**BLUFF/UPPER BLUFF  
IRRIGATION DISTRICT  
728 BIG HORN AVE  
WORLAND, WY 82401**

### **PROJECT MANAGER:**

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## D.2.2.4 Technical Proposal and Evaluation Criteria

### Executive Summary

July 17, 2018

Bluff/Upper Bluff Irrigation District  
Worland, Washakie County, Wyoming

The Bluff/Upper Bluff Irrigation District owns and operates an irrigation canal and in the Worland area of the Bighorn River Basin. This canal is extremely important to the agriculture and economy of the area. The Bluff/Upper Bluff District has identified two pumps needing replacement, due to age and functionality, and have identified the opportunity to improve system operation with modern technology upgrades. This WaterSMART Grant will give the funding needed to replace this aging infrastructure to assist the District in two manners: reduce the chances of failure due to age and install level sensors to modulate the pumps, better match pump flows to system demands and reduce spill. Installation of additional controls on the stations would allow savings of water and electricity and allow reduction of spilled water.

This project, if funded, will begin in early 2019 and will be completed by April 2020.

### Background Data

The Bluff/Upper Bluff Irrigation District is a combination of two Districts; the Bluff Irrigation District and Upper Bluff Irrigation District. The Bluff Irrigation District was formed on August 21, 1931 and has 3,721 acres with 44 landholders. The Upper Bluff Irrigation District was formed on June 5, 1954. It is comprised of 1,596 acres with 38 landholders. The Districts own and operate irrigation canals in the Worland area of the Bighorn River Basin. These canals are extremely important to the agriculture and economy of the area.

The joint canal is almost 10 miles long, and is a canal off of the Hanover Canal (Upper Hanover Canal). Most all irrigated lands in Washakie County are being serviced by the Hanover Canal, with the Bluff and Upper Bluff users operating and maintaining their own portion of the canal. The Hanover canal provides water for irrigation of approximately 24,800 acres with 513 water users. These lands are irrigated for crops such as corn, sugar beets, barley, beans, alfalfa and grass hay, and other forage crops. Much of the farm ground and its crop residue are also used for winter forage and feeding grounds for livestock operations.

Originating in the early 1900's, the Hanover Canal was operated privately and independently until the 1940's, when Congress authorized PL 543, which enabled construction for canal expansion following the organization of the Upper Bluff Irrigation District and Highland-Hanover Irrigation District in 1954, as part of the USDI-BOR Hanover-Bluff Unit. The Bluff Canal was already in existence, expanding the Upper Bluff, and its water was combined with the Hanover Canal, by relocating its point of diversion to a diversion from the Hanover Canal. The addition of pumping units to the Bluff Canal allowed water to be pump to the newly formed Upper Bluff canal, and addition of the Highland Hanover Canal. This expansion of area required additional capacity to be added to the main diversion Hanover Canal operated by the Hanover Irrigation District, and required contract agreements between Reclamation, Hanover Irrigation District, Bluff Irrigation District, Upper Bluff Irrigation District and Highland Hanover Irrigation District.

## Project Location

The Bluff/Upper Bluff Irrigation District is located in Worland, Wyoming, along the beautiful Big Horn River, flowing north to the Yellowstone, downstream of Boysen Reservoir. Significant tributaries within the county are the Nowood River, Nowater Creek, Gooseberry Creek and Fifteenmile Creek. The elevation is approximately 4,000 feet, which allows a longer growing season for agriculture than is common in much of Wyoming. Please reference map in proposal.

## Technical Project Description

The project consists of replacing two existing split case centrifugal pumps with two vertical turbine pumps, operated by Variable Frequency Drive (VFD) motor controls and Programmable Logic Controls (PLC). In addition to the pump replacements, it is proposed to install water level sensors in two locations to provide feedback to the PLC to modulate and adjust flows based on demand.



The existing pumps are split case centrifugals powered by 150 horsepower Electric Motors; one being a Fairbanks-Morse QZK 440V 1170 RPM motor and the other is a US Motor Type R WP1 460V 1185 RPM motor. Both pumps and the Fairbanks Morse motor are believed to be original equipment. The bases, pump cases, and suction volutes are cracked. The motors have vibration, and the pump and piping system is difficult to prime. It is proposed to replace these motors and pumps with modern motors that meet the current efficiency requirements, and vertical turbine pumps. The motors would be operated by a VFD to allow soft starts, avoiding across the line starts. The VFD would allow a broad range of adjustment for the pumps. A single VFD is anticipated with hot switch between pumps, a PLC would be integrated into the system to address system parameters as well as allow alternation of starts between pumps, to reduce wear on a single pump or motor. Additional flow measurement would be integrated, and integration of water level sensors and radios would reduce spills. Following is an example of a four 150HP and one 25HP pump station, similar to the proposed two 150HP station.



It is estimated that annual water spills for the Upper Bluff #1 Pump Canal is 1325 acre-feet per season. This is based on measurements, observation of watermarks, and discussion of operations with members and ditch rider. Western Heritage Consulting and Engineering was requested to review the pump station and determine what extents of replacement or refurbishment are necessary and to determine opportunities for water and power conservation, as well as to provide a cost estimate for the improvements.

Observation of both spills was done on June 13, 2018, with two pumps operating. A spill board at Little Gooseberry Creek Spill (LGC) was observed and measured at 50" in hydraulic length, with an inch of water flowing over it. The board was not level, and the water depth was averaged at 1" deep over the board, which would make the weir H slightly higher, additional flow was going around the ends of the board checks as well as between boards. This flow was not estimated nor included in the calculation. The flow of this spill is estimated by the following weir calculation:

$$\text{Weir Flow Equation: } Q = CLH^{\frac{3}{2}}$$

$$C = 3.1$$

$$L = 50''$$

$$H = 1''$$

$$Q = 3.1 \times 4.167' \times 0.0833^{\frac{3}{2}} = 0.31 \text{ CFS}$$

Little Gooseberry Creek Siphon Spill



End of Canal Spill 6/13/2018:

$$Q = CLH^{\frac{3}{2}}$$

$$C = 3.1$$

$$L = 24''$$

$$H = 8''$$

$$Q = 3.1 \times 2' * 0.67^{\frac{3}{2}} = 3.4 \text{ CFS}$$



*Total Spill Flow 3.71 CFS*

$$3.71 \text{ CFS} \times 1.9834711 \frac{\text{AC} - \text{FT}/\text{DAY}}{\text{CFS}} = 7.36 \text{ AC} - \text{FT}/\text{DAY}$$

$$7.36 \frac{\text{AC} - \text{FT}}{\text{DAY}} * 180 \text{ DAY SEASON} = 1324.8 \frac{\text{AC} - \text{FT}}{\text{SEASON}}$$

*If Reduced at 70% = 927 AC - FT savings*

## E. 1. Technical Proposal: Evaluation Criteria

### E.1.1 A. Project Benefits

Describe the expected benefits and outcomes of implementing the proposed project.

*a. What are the benefits to the applicant's water supply delivery system?*

The project benefits are numerous, and include reduction of water waste from spills, decreased electrical consumption and reduced diversion quantities, reduced pump management and controls, and modernization of existing equipment.

The reduced spills, water conservation and power conservation provide for a great benefit to the District, to upstream water users including Hanover, Highland Hanover, and Bluff Canals, as well as water users downstream. The project has a benefit to Reclamation as it provides modernization to a Reclamation constructed facility, reduces power demand on the Hydroelectric facility that can sell that available power at a higher rate to non-Reclamation customers, and will reduce the demand on stored water and diverted flows in short water periods.

Currently the pump station is operated for either of the pumps to operate or possibly both pumps to operate. If a water user needs to turn water to a field or turn on a pivot or sprinkler, they coordinate with the ditch rider. If one pump is on and water is spilling, the ditch rider determines if enough is spilling to meet the needs, or if an additional pump needs turned on. If excess water is spilling or a water user turns off, the ditch rider will turn down to one pump operating, if it is anticipated that one pump can meet the demand. The pumps do not have a variable frequency drive currently and are either on or off without intermittent adjustment, unless valves are throttled, resulting in higher back pressure to the pumps. This is rarely done, as the extra back pressure on the pumps creates more work for the motors and pumps, resulting in extra wear.

Currently water is spilled at two locations, one immediately upstream of the Little Gooseberry Creek (LGC) Siphon, and at the end of the canal. The spill immediately upstream of the LGC Siphon prevents canal overtopping due to the siphon reaching capacity. The spill at the end of the canal receives all excess water the canal is carrying beyond the siphon.

The current pumps generate approximately 8.5 CFS at 116 FT TDH each when operated independently, though provide approximately 16 CFS when operated simultaneously. This flow rate is approximately 1 CFS/40 acres. The pumps are operated at least 180 days per normal year, with water typically started pumping as early as mid to early April, as soon as Hanover can divert water to Bluff Canal, and as late as early November, until Hanover stops diverting.

The spills were observed spilling approximately 3.7 CFS when observed by Western Heritage Consulting and Engineering June 13, 2018. Spills were approximately 0.3 CFS upstream of LGC Siphon and approximately 3.4 CFS at the end of the canal. Each pivot on the system requires approximately 2 CFS each to operate, requiring that if the demand on the system is greater than 4 pivots, the second pump must be turned on, and if a pivot is shut down, at least 2 CFS could be spilled in excess of the previous spill amount. The inability to adjust the pump station down to a 2 or 4 cfs rate on or off results in excess spills.

*b. If other benefits are expected explain those as well. Consider the following:*

- Extent to which the proposed project improves overall water supply reliability.*

Since the supply for the Bluff/Upper Bluff Irrigation District relies solely on pumped water, if these pumps were to break down or continue to wear and are not replaced, the water users will not have water supplied. There is no gravity flow to the acreage, therefore, it is imperative that the pumps are in working order for water supply reliability. The improved efficiency and reduced spills allows availability of conserved water to be used in other water short areas of the canal system and ultimately the river system. Current spills do not directly discharge back to the Bluff canal, and slowly wind their way back to the Big Horn River. The water supply to the pumps is a very reliable supply, it is a gravity feed from the Hanover Canal, diverted from the Big Horn River by a concrete diversion structure, and diverts before the Hanover Flume that crosses the river.
- The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin)*

This pump replacement project will benefit the local water users and will help the entire basin by reducing spills and allowing for conservation of water and energy. Benefit will be to the Upper Bluff Canal users, the Bluff Canal Users, and extend to the Hanover, Highland Hanover, Lower Hanover, Big Horn Canal, and beyond to water users further downstream.
- Extent to which the proposed project will increase collaboration and information sharing among water managers in the region.*

Water use is currently managed by communication between water users and the ditch rider for water on and water off. The improvements would allow less need for contact with the ditch rider, other than informative, and would reduce the number of trips to the pump site to adjust pumps. The communication would be increased in that the pump could be equipped to communicate via cellular modem to provide warnings and errors to users, and be programmed to restart, or be started remotely. The current pumps are not equipped with variable frequency drives, so the pumps are either off or on without intermittent adjustment unless valves are throttled, resulting in higher back pressure to the pumps. This does not allow them to be started slowly, or remotely, requiring onsite adjustments during startup. Also, the existing pumps are centrifugal and require priming which can be an arduous task.
- Any anticipated positive impacts/benefits to local sectors and economies (e.g., agriculture, environment, recreation, tourism)*

Benefit would be primarily to the agriculture sector by allowing more efficient and effective irrigation of the crops. The environment benefits by less diversion, less power consumption, freeing up hydroelectric power to replace other coal or gas generated power. The financial impact of reducing operating costs to the operators as well as increasing crop quality or yield causes a trickle down effect, allowing the saved expenditures to be spent in other areas of the local community.
- Extent to which the project will complement work done in coordination with NRCS in the area (e.g., with a direct connection to the district's water supply). Describe any on-farm efficiency work that is currently being completed or is anticipated to be completed in the future using NRCS assistance through EQIP or other programs.*

The USDA-NRCS Worland Field Office received 40-50 applications per year for on-farm efficiency improvement projects. Majority of those applications are for water conservation, converting from flood irrigation to pivots, as well as piping conveyances. The dependability of the canal to deliver water is imperative for the on-farm improvements to be effective. According to the Worland Office, approximately 50% of the applications are EQIP eligible and would be positively affected by improvements on the Hanover Canal and Bluff/Upper Bluff Canal. Without dependable pumps, water

cannot be dependably delivered. The improvements to the canal will also allow piping of the canal in the future, it has been identified that piping downstream of the LGC Siphon would be cost effective and beneficial for water savings as well as harvest available gravity head pressure, which would allow reduction in power or elimination of pumps to existing and future pivots.

### E.1.2 B. Planning Efforts Supporting the Project

*Describe how your project is supported by an existing planning effort.*

- *Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?*

Bluff/Upper Bluff Irrigation District underwent a feasibility study in 1988 with the Wyoming Water Development Commission to assist them in the identification of repairs needed for canal improvement and subsequently in the Worland Area Irrigated Lands GIS Level II Feasibility Study, 2007. The 1988 study identified that the pumps needed replacement and reconfigured, the 2007 study did not inventory nor assess the pumps. The canal has completed some of the repairs identified but did not replace the pumps. The pumps have been repaired, repeatedly, with annual costs for pump station #1 exceeding \$50,000 during one season. The District is pursuing a new contract with the Wyoming Water Development Commission for 2019 funding for a Level I Master Plan Study to review the system again, as well as seeking Level III funding for assistance in replacing Pump station #1.

- *Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.*

Due to the cost of repairs exceeding \$50,000 per year in addition to the imminent failure of the pump station, it has been identified as a priority. Also, due to the entire supply being either delivered or NOT delivered resting on the life of these pumps, it has been moved to the top of the priority list. There are always many repairs, upgrades and modifications on an irrigation canal, but none so important as the pumps that supply the canal.

### E.1.3 C. Project Implementation

*Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Please see Gantt chart showing the stages and duration of the proposed work, located at the end of this document.*

- *Describe any permits that will be required, along with the process for obtaining such permits.*  
It is not anticipated that any permits will be required for this project other than an electrical permit, which the construction contractor will obtain. It is possible, though unlikely, a construction dewatering permit may be required.
- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*  
The Donnell Report from 1988 identifies the flow and head requirements for the pumps and identifies the need for replacement. Site visit and review by Western Heritage Consulting and Engineering confirmed the need for replacement and developed updated costs for the replacement based on industry knowledge and materials quotes obtained by the District.
- *Describe any new policies or administrative actions required to implement the project.*

No new policies have been identified, though collaboration with the remote sensors and standard operational procedures for startup and shut down will be required.

- *Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation office?*

Environmental Compliance has not had a cost assigned to it other than disposal/recycling of existing equipment. The disturbance area will not be beyond the existing operation and maintenance impact area. A value was assigned for an archeological clearance site visit and review, due to the age of the existing pumps. An in-depth study with documentation is not anticipated.

#### E.1.4. D. Nexus to Reclamation

*Is the proposed project connected to a Reclamation project or activity? If so, how? Please consider the following:*

- *Does the applicant receive Reclamation project water?*

Yes, Upper Bluff receives water from the Hanover Canal Diversions from the Big Horn River and stored water from Boysen Reservoir. The Hanover Canal coordinates with the Bureau of Reclamation for water volumes needed to be delivered in the river stored in Boysen Reservoir when flows are above and beyond natural flows. The power provided to the project is from a WAPA electric supply contract.

- *Is the project on Reclamation project lands or involving Reclamation facilities?*

Yes, Boysen Reservoir is a Reclamation reservoir. Upper Bluff is a Reclamation constructed facility, situated on privately owned land-owned by the District, which receives power for pump operation from power generated at Boysen and delivered from a WAPA agreement.

- *Is the project in the same basin as a Reclamation project or activity?*

Yes, the Hanover-Bluff Unit is part of the Wind River/Big Horn Basin.

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

With more efficient pumping and less spills, ultimately less diversion, conserved water will stay in Boysen Reservoir or the Big Horn River system. Spilled water will more directly contribute to river flows for down drainage Reclamation facilities such as Yellowtail.

- *Will the project benefit any tribe(s)?*

No actual Tribes are on the Hanover/Bluff or Upper Bluff Canal, but American Indian landowners are. Boysen reservoir is situated among tribal lands. The benefit to tribes or tribal lands is undetermined.

#### E.1.5 E. Department of the Interior Priorities

*Modernizing our infrastructure*

*a. Support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;*

*b. Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;*

*c. Prioritize DOI infrastructure needs to highlight:*

1. *Construction of infrastructure;*
2. *Cyclical maintenance;*

### 3. *Deferred maintenance.*

The Pump Replacement project directly supports the Department of Interior priorities. This project will modernize this aging infrastructure that is extremely important to the Bureau of Reclamation sponsored districts and Bluff/Upper Bluff Irrigation Districts, to ensure water delivery to the American/Wyoming farmers and ranchers. We have completed all routine, minor and major maintenance events on the pumps, though they have reached their intended useful life and we have the opportunity to improve reliability, delivery and conserve water and energy with this replacement. We will continue to follow proper maintenance schedules to ensure the pumps maintain good working condition for years to come, as mentioned the pumps are the sole water supply to the acreage under the Upper Bluff #1 pump station.

## D.2.2.5 Project Budget

### Funding Plan and Letters of Commitment

#### Letters of Commitment

There are currently no Letters of Commitment, but we are applying for funding with Wyoming Water Development Commission for Level III Construction Funding for this project. It is anticipated to be approved in the 2019 Construction Bill for the State of Wyoming. The funding source is:

Wyoming Water Development Commission  
Peter Gill, Project Manager  
6920 Yellowtail Drive  
Cheyenne, WY 82002  
(307) 777-7626  
Peter.Gill@wyo.gov

#### Funding Plan

The Bluff/Upper Bluff Irrigation District Funding Plan is as follows:

The funding for the project will consist of the WaterSmart Funding, State of Wyoming- Water Development Office funding, and private funding from the water users. The project is being request for funding from the State of Wyoming simultaneous with this WaterSmart application. A larger amount of funding is anticipated from Wyoming Water Development, with **LESS THAN 50% funding from WaterSmart and other Federal Funds.**

- *How you will make your contribution to the cost-share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).*

Our contribution will consist of in-kind contributions as well as our reserve account.

- *Describe any donations or in-kind costs incurred before the anticipated Project start date that you seek to include as project costs. For each cost, identify:*
  - *The project expenditure and amount*
  - *The date of cost incurrence*

- *How the expenditure benefits the Project*
- *Provide the identity and amount of funding to be provided by funding partners.*
- *Describe any funding requested or received from other Federal partners. Note: other sources of Federal funding may not be counted towards the required cost share unless otherwise allowed by statute.*

There is no additional funding requested or received from other Federal Partners.

- *Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.*

Funding for a Wyoming Water Development Level III project is simultaneously being applied for. Funding from the Reclamation and Wyoming Water Development is imperative to the implementation of the advanced controls and water monitoring/measurement. If the funding from either source is not received, the pump station may be reduced to a simple pump and motor replacement, likely of only one pump and motor.

FUNDING SOURCES	AMOUNT
<b>Non Federal Entities</b>	
1. State of Wyoming-Wyoming Water Development Commission	\$ 174,414
2. Upper Bluff Irrigation District	\$ 12,076
3. Upper Bluff Irr.Dist.-In Kind- Management/Administrative Not Quantified	
<b>Non-Federal Subtotal</b>	<b>\$ 186,490</b>
<b>Other Federal Entities</b>	
1	
2	
3	
<b>Other Federal Subtotal</b>	
<b>REQUESTED RECLAMATION FUNDING</b>	<b>\$ 75,000</b>
<b>Project Total</b>	<b>\$ 261,490</b>

Note: constructed replacement costs and equipment are less than \$200,000.

### Budget Proposal

Please reference the following Cost Estimate prepared by Engineer for Wyoming Water Development Commission project, modified to add additional water measurement and automation components and costs associated with NEPA & SHPO Compliance.

Project Name:	Upper Bluff Irrigation District				
Project Number:	2018P026				
Prepared By:	Western Heritage Consulting & Engineering				
Concept Design:	Replacement of Upper Bluff Pump #1				
Preparation of Final Designs and Specifications					
Preparation of Final Plans & Specs:					
	Survey & Contract Setup			\$	6,500.00
	50% DD			\$	7,500.00
	90% DD & Const Specs			\$	7,500.00
	100 % CD-Pre-Bid			\$	4,500.00
	Post Bid & Const. Contracting			\$	5,300.00
	Construction Inspection & Q/A			\$	12,600.00
	AsBuilt			\$	4,900.00
	Geotechnical/ Structural Investigation			\$	3,200.00
				Task Total	\$ 52,000.00
Permitting					
	WDEQ			\$	1,000.00
	BOR			\$	3,000.00
	NEPA			\$	-
	SHPO			\$	4,500.00
				Task Total	\$ 8,500.00
Permitting Mitigation					
	Mitigation for NEPA/SHPO			TBD	Estimated at \$0
				Task Total	\$ -
Legal Fees					
	Title Opinion & Legal Review			\$	1,000.00
				Task Total	\$ 1,000.00
Acquisition of Access and Rights of Way					
	None Required			\$	-
				Task Total	\$ -
Cost of Project Components					
	Mobilization, Bonds, Insurance			\$	5,000.00
	Demolition & Dispose of Equipment			\$	5,000.00
	Earthwork/Civil			\$	2,000.00
	Structural Concrete-Formed Reinforced			\$	3,500.00
	Pump, Motors, Skid-300 HP			\$	110,400.00
	Piping & Valves			\$	3,500.00
	Motor Controls, VFD, Sensors	1 EA		\$	53,000.00
	Elect. Actuators,PLC & Measurement	3 EA		\$	17,590.00
				Task Total	\$ 199,990.00
				<b>PROJECT TOTAL</b>	<b>\$ 261,490.00</b>
				BOR Water Smart	\$ 75,000 28%
				WWDC GRANT	\$ 174,414 67%
				WWDC LOAN	\$ - 0%
				Upper Bluff Cash/In Kind	\$ 12,076 5%

## 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 the budget proposal. If in-kind contributions or donations of goods and services are included in the budget proposal, the narrative should identify the source(s) and describe how the value of the goods and services was determined the types of information to describe in the narrative include, but are not limited to, those listed in the following subsections. Costs, including the valuation of in-kind contributions and donations, must comply with the applicable cost principles contained in 2 CFR Part §200, available at the Electronic Code of Federal Regulations ([www.ecfr.gov](http://www.ecfr.gov)).*

### Budget Narrative:

The cost budget for the project was developed by Western Heritage Consulting & Engineering in preparation for application for this grant, as well as a Level III Construction Project to determine cost associated with pump upgrades, replacement and improvements. The budget was updated to include additional costs associated with performing SHPO surveys and compliance consultation. NEPA cost was not considered as the disturbance is within the existing operation and maintenance footprint, electrical and water demands will be less than historical. It is assumed that all work for the project will be subcontracted out to Construction Contractors and Design Consultants. Bluff/Upper Bluff Irrigation District's contribution by the Board of Directors for management and oversight, as well as bookkeeping and payment processing, is assumed in-kind, though substantial amounts of time will be required, and not noted in the budget. Additionally, the District will be required to pay a portion of the cost, or provide services like demolition and disposal.

Labor Rates of actual personnel were not individually identified in the budgeting process, though were considered based on local contracting rates with hourly rates plus fringe, exceeding current published Davis-Bacon Wage rates.

The budget was developed considering the following thought process and requirements:

The Design development phase of the project assumes that a Wyoming Licensed Professional Engineering firm will develop design documents, construction documents and perform construction inspections. The design documents assume two submittals and review by WWDC project manager, Reclamation and Upper Bluff Irrigation District, 50%, 90%. The comments will be incorporated into a 100% CD set with full construction specifications, and contract documents. As a State of Wyoming publicly funded project, a bid and advertisement process will be followed. The costs associated with engineering and construction inspection exceed 8% of the budget for both design and construction inspection, as additional submittals and contract document preparation are required associated with the WWDC process. The scope of the project requires multiple professionals and experts to observe the site and prepare reports and drawings. A project with a large budget would likely have similar design costs, resulting in a lower engineering percentage.

Construction staking and as-constructed documentation and survey will be performed. Construction Quality control is part of the Contractor's Responsibility with Quality Assurance activities by the design engineer, with observation activities by the design engineer staff for critical installation phases. Also, the Upper Bluff Irrigation District will perform periodic inspections.

The budget for permitting and design phase tasks include confirmation of existing title and easements by performing a title search and obtaining an opinion that the title is clear for the proposed construction activities. Also, compliance with SHPO were added as part of the WaterSMART application process, assuming coordination with the Wyoming SPHO is assumed, as some documentation will likely be required due to the age of the original structure.

The construction materials and construction activities will be provided by a Construction Contractor, and all materials will be new or virgin construction materials. The cost of the components was developed using localized unit costs, extrapolated to the estimated quantity for the project, assuming a public works project with local government oversight. The list was modified to add additional electrical actuation and controls for the WaterSMART amenities to the pump station. Reference was made to past projects, with similar sized pump stations and similar controls and locally provided cost estimate for replacement pumps.

The time period for cost estimation assumed winter of 2020 construction, though this could be delayed to Winter of 2021 depending on funding availability.

#### D.2.2.6 Environmental and Cultural Resources Compliance

- *Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.*  
The site is currently disturbed and proposed construction involves minimal, if any, grading, and some concrete pouring. Dewatering of the existing concrete sump will be required, and discharge will be back to the canal, likely no need for a dewatering permit. The dewatering is of an existing concrete structure. Animal habitats are not anticipated to be impacted, airborne dust is anticipated to be minimal, if any.

- *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?*

None known. According to Environmental Conservation Online System (ECOS), no critical habitat is shown for the site on their GIS interactive map.

- *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.*

No

- *When was the water delivery system constructed?*

Some components and planning as early as 1904. Subject structure was constructed by Reclamation in 1954-1956 era.

- *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.*

Subject structure was constructed approximately 1954-1956, though exact date not definitively known.

- 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.

Structures may be subject to/eligible for listing. The SHPO process will need to determine required documentation and specifically if subject structure is eligible for listing. The pump station concrete structure has been modified in the past associated with Reclamation operations and maintenance requirements.

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

None known.

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

None.

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

None known.

- 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?

None.

### D.2.2.7 Required Permits or Approvals

No external permits are foreseen, a dewatering permit may be required for construction activities, and will be the responsibility of the Contractor. The approval of funding with Wyoming Water Development Commission is approved through the 2018 Construction Bill for the State of Wyoming.

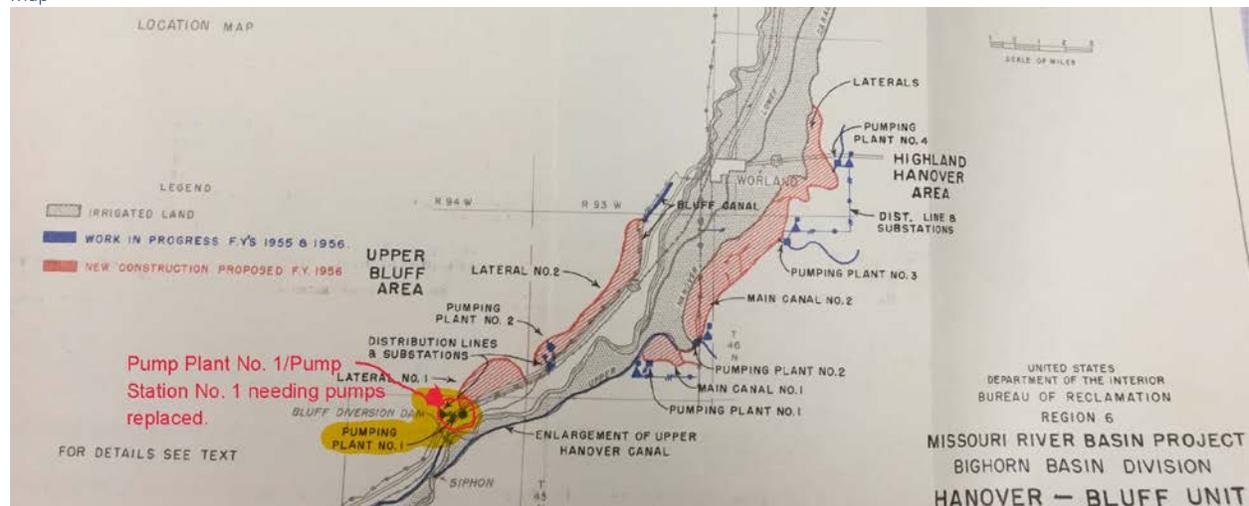
### D.2.2.8 Official Resolution

Please see attached Resolution.

### Letters of Project Support

See following letters of Project Support.

Map



WBS	Task	Start	End	Work Days	2019 Feb	2019 Mar	2019 Apr	2019 May	2019 Jun	2019 Jul	2019 Aug	2019 Sep	2019 Oct	2019 Nov	2019 Dec	2020 Jan	2020 Feb	2020 Mar	2020 Apr	2020 May
<b>1</b>	<b>Scoping and Project Meetings</b>	Fri 3/01/19	Thu 3/21/19	15																
1.1	Contract Award	Fri 3/01/19	Thu 3/07/19	5																
1.2	Kick-Off Meeting	Fri 3/15/19	Thu 3/21/19	5																
<b>2</b>	<b>Information Collection and Submittals</b>	Thu 3/21/19	Wed 4/17/19	1																
2.1	Geotechnical	Thu 3/21/19	Wed 4/17/19	20																
2.2	Survey	Thu 3/21/19	Wed 4/03/19	10																
2.3	Title Report	Thu 3/21/19	Wed 4/10/19	15																
<b>3</b>	<b>Design 10-90%</b>	Mon 5/06/19	Mon 9/30/19	103																
3.1	50% Set Design Phase	Mon 5/06/19	Wed 6/12/19	27																
3.2	EOC-50%	Thu 5/16/19	Wed 5/22/19	5																
3.3	EJCDC Contract-50%	Sun 5/12/19	Fri 5/24/19	10																
3.4	Bid Details-50%-Blank Form	Fri 6/07/19	Thu 6/13/19	5																
3.5	50% Set-WWDC REVIEW	Wed 6/12/19	Thu 7/11/19	21																
3.6	Compliance w/Sage Grouse WY	Fri 6/15/18	Thu 6/28/18	10																
3.7	90% Set Design Phase	Wed 7/31/19	Tue 8/27/19	20																
3.8	EJCDC Contract-90%	Tue 8/06/19	Thu 8/29/19	18																
3.9	EOC-90%	Mon 8/12/19	Fri 8/16/19	5																
3.10	Bid Details-90%-DRAFT DOC	Thu 8/15/19	Tue 9/10/19	18																
3.11	90% Set-BOR/WWDC REVIEW	Tue 8/27/19	Mon 9/30/19	24																
<b>4</b>	<b>Construction Bidding-PREBID</b>	Mon 9/30/19	Wed 10/23/19	17																
4.1	Advertise	Mon 9/30/19	Mon 10/21/19	15																
4.2	Bid Showing	Tue 10/15/19	Tue 10/15/19	1																
4.3	Bid Showing Minutes	Thu 10/17/19	Fri 10/18/19	2																
4.4	Stake for Bid	Mon 10/14/19	Tue 10/22/19	7																
4.5	Addenda	Thu 10/17/19	Thu 10/17/19	1																
4.6	Bid Closing	Mon 10/21/19	Mon 10/21/19	1																
4.7	Bid Tabulation	Mon 10/21/19	Wed 10/23/19	3																
<b>4</b>	<b>Post-Bid</b>	Sat 10/26/19	Thu 4/16/20																	
4.7	Contractor Agreement	Sat 10/26/19	Fri 11/01/19	5																
4.8	Notice of Award	Sun 10/27/19	Mon 10/28/19	1																
4.9	Pre-Construction Meeting	Sat 11/02/19	Tue 11/05/19	2																
4.10	Pre-Con Minutes	Mon 11/04/19	Tue 11/05/19	2																
4.11	Construction Period	Sat 11/09/19	Tue 11/12/19	2																
4.12	Progress Payment Approvals	Sat 11/09/19	Fri 3/20/20	90																
4.13	Field Orders	Sat 11/09/19	Fri 3/20/20	90																
4.14	Work Change Orders/Change Di	Sat 11/09/19	Fri 3/20/20	90																
4.15	Engineers Weekly Const. Report	Sat 11/09/19	Fri 3/20/20	90																
4.16	Punch List	Tue 3/10/20	Wed 3/11/20	2																
4.17	Contract Final Walk Thru	Sat 3/14/20	Tue 3/17/20	2																
4.18	Certificate of Substantial	Tue 3/17/20	Wed 3/18/20	2																
4.19	Certificate of Final Completion	Fri 3/27/20	Mon 3/30/20	2																
4.20	Adv. 3 Times-Contract Close out	Fri 3/27/20	Thu 4/16/20	15																
	Post at Work Site-Work	Fri 3/20/20	Fri 4/10/20	16																
4.21	Acceptance																			
4.22	Final Project Tabulation	Mon 3/30/20	Tue 3/31/20	2																
4.23	WS 16-6-117 Compliance Doc	Mon 3/30/20	Fri 4/10/20	10																
4.24	Warranty Document	Fri 3/27/20	Thu 4/16/20	15																
4.25	Asbuilt Drawing	Fri 3/27/20	Thu 4/16/20	15																
4.26	O&M Manual	Fri 3/27/20	Thu 4/16/20	15																

**RESOLUTION NO. 02-18**

Entitled: A RESOLUTION AUTHORIZING APPROVAL TO PURSUE THE WATERSMART GRANT THROUGH THE BUREAU OF RECLAMATION FOR THE UPPER BLUFF IRRIGATION DISTRICT NEAR WORLAND, WYOMING.

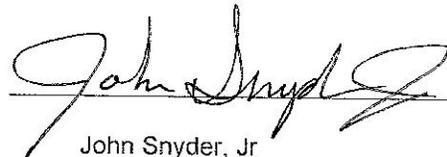
**WITNESSETH**

**NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE UPPER BLUFF IRRIGATION DISTRICT IN WORLAND WYOMING:**

1. The Upper Bluff Irrigation District Board desires greater operational efficiency within the Upper Bluff Canal and authorizes staff to commit efforts and funds to undertake this endeavor. The budget shall not exceed \$261,490.00. The Upper Bluff Irrigation District Board confirms they have the funds necessary for their portion in the repair and maintenance account.

**BE IT FURTHER RESOLVED**, that John Snyder, Jr, Treasurer is hereby designated as the authorized representative of the Irrigation District, to act on behalf of the Governing Body on all matters relating to this Level funding request.

PASSED, APPROVED AND ADOPTED THIS 26th DAY OF July 2018



John Snyder, Jr  
District Treasurer

Attest:



Sandy Richard

May 3, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
ATTN: Darren Olson  
P.O. Box 25007, MS 84-27814  
Denver, Colorado 80225

RE: WaterSmart Grant BOR- DO-18-F006

Dear Mr. Olson,

We the undersigned landholders, who own land on the Bluff and Upper Bluff Irrigation District, are in support of the project consisting of replacing the existing motors and pumps at Pump Station #1.

The project will help conserve and use water more efficiently and accomplish other benefits that contribute to water supply reliability. This will also help farmers make on-farm improvements in the future.

Sincerely,

*Steve Swanson*

*Jay Z. Kootz*

*Stan Lass Sage Creek Farm & Cattle*

*Rob Ditt*

*Kathy Stuckey*  
*Jim Weber*



May 3, 2018

Bureau of Reclamation  
Financial Assistance Support Section  
Attn: Mr. Darren Olson  
P.O. box 25007, MS 84-27814  
Denver, CO 80225

Re: Upper Bluff Irrigation District, Big Horn Basin, Wyoming

Mr. Darren Olson:

I write this letter in support of the proposed project to replace pumps and motors at Pump Station #1 for the Upper Bluff Irrigation District in Wyoming's Big Horn Basin. I write this letter in two capacities. First, as the President & CEO of Wyoming Sugar Company and second, as a member of the Wyoming Legislature serving House District 27.

It is my understanding that the proposed project will conserve water and allow for a more efficiently use of the irrigation water. Water is one of Wyoming's most precious resources and its beneficial use in agriculture is vital to the economic wellbeing of our communities in the Big Horn Basin. In particular any project that assist our local growers in becoming more efficient, while conserving a natural resource of great importance to the Wyoming Sugar Company and the State of Wyoming. Wyoming Sugar Company has been in existence for 101 years and provides the opportunity to process sugar beets grown in the area into refined white sugar for human consumption. It provides over 150 manufacturing jobs, plus hundreds more on the individual farms in the area. The Company is owned by its growers and therefore the growers are subject to all market risk. As with all commodities, prices rarely keep pace with costs; therefore, the only remedy is efficiency. This project will definitely assist in achieving such efficiency.

Respectfully,

Michael D. Greear  
President & CEO  
State Representative  
HD-27