

FUNDING OPPORTUNITY ANNOUNCEMENT No. BOR-DO-18-F004
**COTTONWOOD CHECK AND SPILL
REPLACEMENT**

**WATERSMART GRANTS:
WATER AND ENERGY EFFICIENCY GRANTS FOR
FISCAL YEAR 2018**

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APPLICANT:
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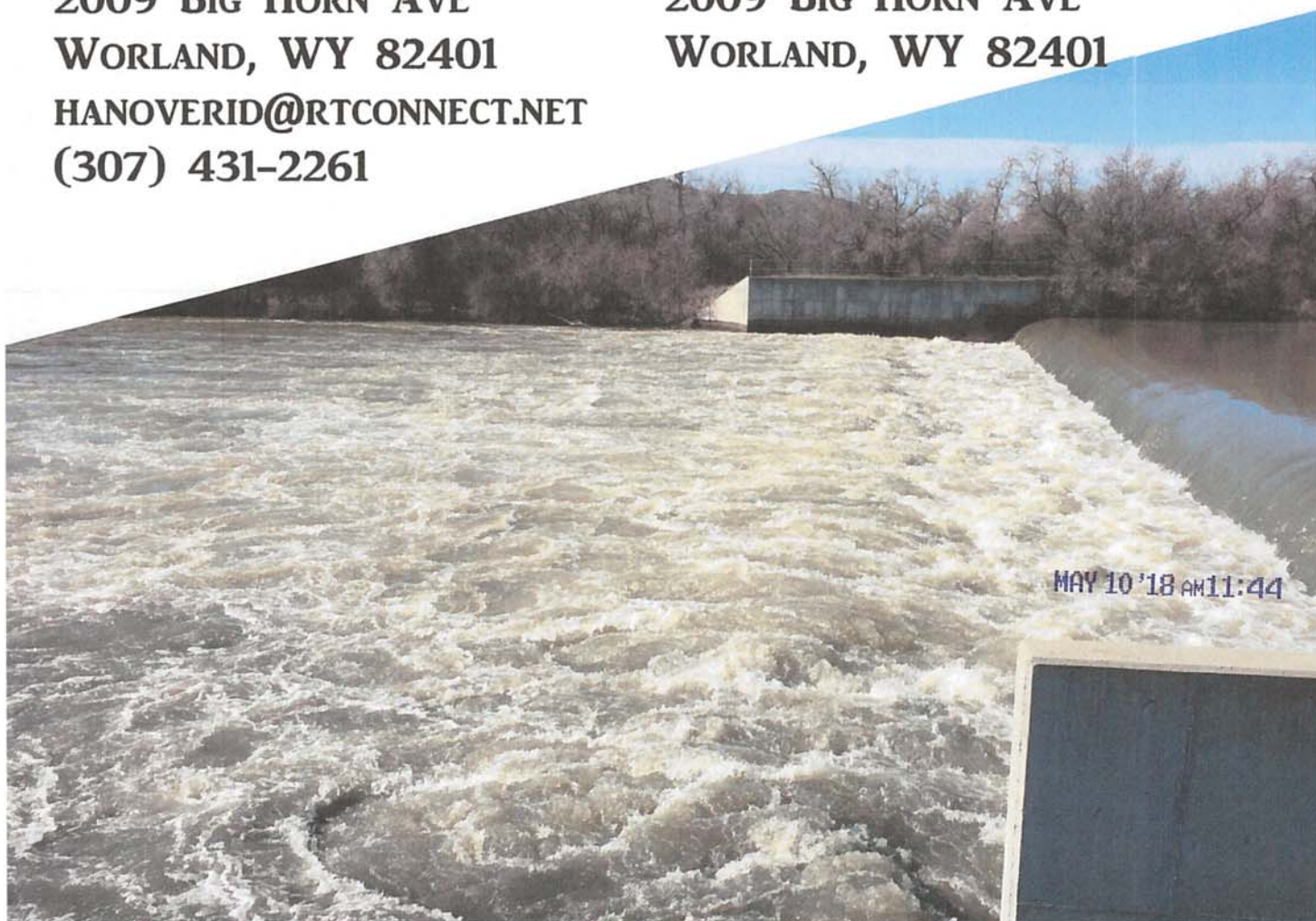


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E.1. Technical Proposal

Executive Summary

May 8, 2018

Hanover Irrigation District
Worland, Washakie County, Wyoming

The Hanover Irrigation District (HID) owns and operates the main irrigation canal and diversion in the Worland area of the Bighorn River Basin. This canal is extremely important to the agriculture and economy of the area. The Hanover Irrigation District recently completed a Master Plan Study to identify and rank necessary improvements. Based on this study, the Cottonwood Spill and Check Structure were identified as needing replaced. 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 conserve water based on the ability to control the level in the canal with a SCADA system, as well as utilize the structures in the manner intended during major events.

This project will begin in early 2019 and will be completed by March, 2020.

Background Data

The Hanover Irrigation District (HID) owns and operates the main irrigation canal and diversion in the Worland area of the Bighorn River Basin. This canal is extremely important to the agriculture and economy of the area. It extends from nearly the southern border of Washakie County to the northern border, and it supplies the water needs of three other irrigation districts including Upper Bluff, Bluff and Highland Hanover. These also contribute tailwater, overflow and drainage water to the Bighorn River and Lower Hanover Canal.

The Hanover Canal is almost 35 miles long, stretching the length of the county from North to South, with most all irrigated lands in Washakie County being serviced by this important canal. It 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 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. 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 canal operated by the Hanover Irrigation District, and required contract agreements between Reclamation, Hanover Irrigation District, Bluff Irrigation District, Upper Bluff Irrigation District & Highland Hanover Irrigation District. The Upper Hanover Irrigation District and Hanover Canal are names that the district and canal often went by, though it was found the proper registered name of the district is the Hanover Irrigation District, as organized under the statutes of the State of Wyoming.

The Hanover Irrigation District has done multiple studies to analyze and improve the canal. Along with a USDI-Bureau of Reclamation- Missouri River Basin Project, Definite Plan Report Volume-I-General Plan, Bluff Unit-Wyoming, Big Horn Basin Division, 1953, that generalized as the expansion of the Hanover Canal to accommodate the flow for the Bluff, Upper Bluff and Highland Hanover, HID has also done the following studies through the Wyoming Water Development Commission(WWDC):

1. Level III, Hanover Irrigation, 1990, (Moss Catcher- Completed 1992)
2. Level II, Upper Hanover Rehabilitation, 1990, (Plan)
3. Level III, Upper Hanover Water Supply, 1991, (Wasteways/flumes/liner- Completed 1994)
4. Level III, Hanover Flume Rehabilitation, 2003, (Flume Reline- Completed 2005)
5. Level II, Worland Area Irrigated Lands Geographic Information System, 2007, (GIS).
6. Level I, Hanover Irrigation District Master Plan, 2017

As a result of these studies, Hanover Irrigation District has taken action to improve infrastructure on the canal. A list of projects were identified in the 2017 study and are listed as follows:

Replacement Priority	Structure Identifier	Replacement/Improvement Projects
1	HC-LI-003 to HC-LI-004	Bighorn Flume-PH1 (Structural & Lining Repairs)
2	HC-WW-001/ HC-CH-001	Cottonwood Spill/Check
3	HC-HG-001	Structural Repairs- Diversion Structure & Trash Deflector
4	HC-LI-006 to HC-LI-008	Lined Section-Piped
5	HC-CH-009, 005, 007, 008	Check Structures
6	HC-MD-001	Measuring Device
7	HC-PI-004 to UHC-DR-003	End Of Canal Piping (28,000 FT +/-)
8	HC-SI-008	Air Vent- Rehabilitate/Exercise Valves
9	HC-WW-012	Repairs-wall cracks, sediment, heaving of slab in canal
10	HC-WW-003	Repairs-concrete cracks, sediment, heaving of slab in canal

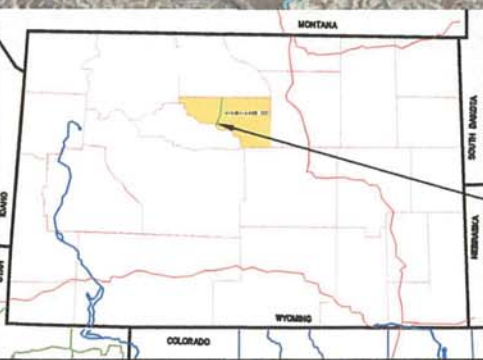
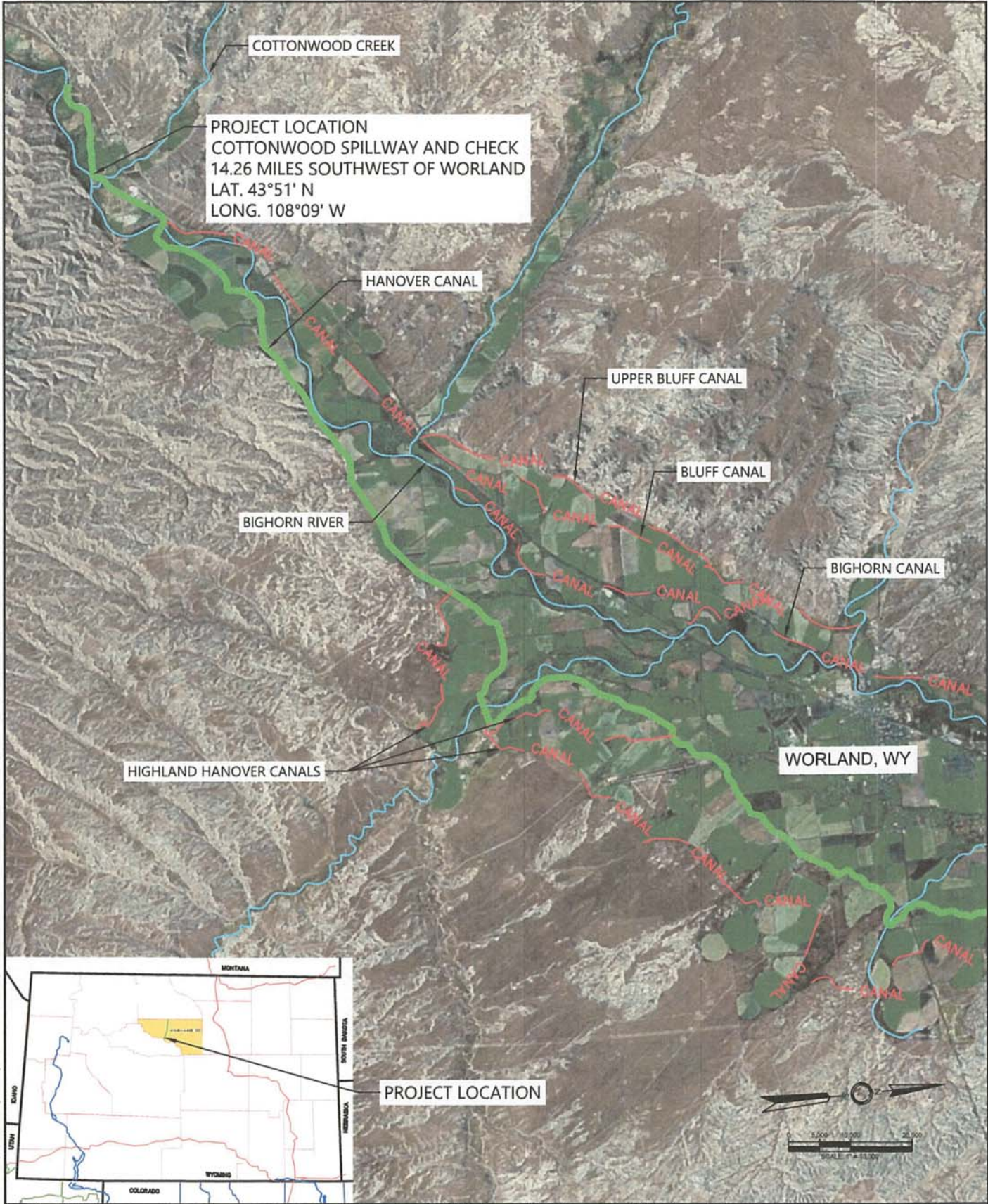
This application is to complete the replacement of #2 Cottonwood Spill and Check Structure.

Past Working Relationships

The Hanover Irrigation District is very involved with the USDI-Bureau of Reclamation, as the Hanover Canal serves as a carrier canal for other irrigation districts after consolidation efforts by USDI-BOR (Reclamation) to consolidate the diversion points and expand the service acreage by addition of pumping units to service elevated service areas. The District and BOR work closely on operations and maintenance, and will be working closely on all upcoming repair and replacement projects. The local BOR employees are familiar with the District and our employees.

Project Location

Hanover 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. Reference following location map:



W:\Clients\18WHC805 HND Cottonwood Spillway\CAD\Drawings\Working\18WHC805 Cottonwood.dwg, 5/7/2018 4:37:16 PM

Job Number:
18WHC805
Sheet Number:
COTTON WS1

WH Western Heritage
Consulting & Engineering
307.215.7430 PO BOX 2117
info@westernhce.com Mills, WY 82644

Rev	Date	Description	By

Scale: 1"=10,000'
Designed By: JAJ
Reviewed By: RLA

Title:
**HANOVER IRRIGATION DISTRICT
COTTONWOOD SPILLWAY
WASHAKIE COUNTY, WYOMING**

Technical Project Description

Cottonwood Spill & Check

Once the Level I, Hanover Irrigation District Master Plan was completed, Hanover Irrigation District applied for a Level III Construction fund project funding to continue to repair, replace and improve the canal. The Wyoming Water Development Commission has awarded the HID a Level III Construction grant for a portion of the Cottonwood Spill Project. The Cottonwood Spill (HC-WW-001) & Check (HC-CH-001) structures were identified together as a top priority in the recent Master Plan, as operation is impaired, and remaining useful life is limited. **If it were to fail, nearly all irrigated service acreage would be without water.** Recent inspection and assessment found that the check structure was of very early construction, and is now near the end of its useful life. The concrete has deteriorated by spalling, and contains numerous severe structural cracks. Also troubling is substantial steel deterioration affecting the function of the gates. The safety railing is not adequately supported. The gate operators are functional; though the linkage and gates do not give proper sealing during closure. They are unable to be opened manually. Opening now requires additional assistance such as lifting with a backhoe.



Figure 3.4 Cottonwood Check

The spill portion of the Cottonwood Structure (HC-WW-001) is a 1955 structure nearing the end of its useful life. The structure was found to have a deteriorated wood decking surface, with concrete structural cracks and spalling, and the function of the automated gate had failed and spill had been modified by concreting the opening shut, preventing the ability for the canal to regulate itself, and to be opened for emergency spills of a full canal. With the replacement of the Check and Spill, it will help operators manage the canal more precisely, and thus provide more constant water deliveries and water savings. The structure repair and replacement was identified as an opportunity to integrate automation into the canal system as well as a water saving location. The location is currently a manually operated spill which has its boards adjusted daily. It is used to prevent excess diverted water from flowing downstream to other spill points along the canal, and potentially causing canal breach or overflow. The location is one of the last locations for safe spill in very close proximity to the river. The spill point is downstream of the state water measurement point, recording river diversions. The spill flows are not currently measured nor recorded, and was identified as a location where measurement would be

preferred to understand the canal operations and consumption better. The following application is for enhancement of the WWDC cottonwood spill and check structure to add automation and water measurement capabilities.

Evaluation Criteria

E.1.1 A. Quantifiable Water Savings

Improving water efficiency by modernizing existing infrastructure in the basis for this project. Due to the inability of the canal to regulate itself, and the lack of functioning as intended, the canal relies on personnel to regulate. With that, the personnel can only open and close the check structure with equipment, therefore reducing the ability to regulate based on the availability of equipment. Consistent water management has a direct reflection on water savings.

Estimated Water Savings: 1165 AC-FT

Current losses: 2718 AC-FT

Support/Documentation of Estimated Water Savings: The estimate for the current ongoing water loss is

(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 the following:

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

No measuring device is currently present at the spill or downstream of the Cottonwood spill that can verify water spill or excess water going down canal to other spills farther from the river or additional seepage. Based on conversations with current ditch riders, observation of operating conditions, and historical water marks an amount of water currently spilled was estimated. Two openings five feet in width each currently spill water and provide level control. These are board check spills and are monitored or adjusted typically daily. The canal operates approximately 210-215 days per year.

The weir equation of $Q=CLH^{3/2}$ was used to determine approximate amount of spill. It is assumed that each opening is spilling, one at a depth of 6" (.5 feet) and the other at 2" (0.1667 feet). That provides a spill amount of 5.43 CFS and 1.04 CFS respectively. That would be an estimated 2718 AC-FT spilled over the season, and could be assumed as the same too much going down canal. If we assume that the automation can reduce this waste or downstream overage by 1/2, and/or assume it is 12 hours between adjustment of the headgate and spill each day. That would be 12 hours a day of water savings for the length of the irrigation season, assuming no spills early and late in the season or during high demand, low river flow; using a 180 days at 12 hours per day is 1165 AC-FT of water spill back to the river that would have gone down canal and been subject to further conveyance losses, sent down other drains farther from the river, and sent into other tributaries to the river.

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.

SEE a.

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? Flows are not currently measured at the spill location, the ditch rider adjusts boards to match diversion as well as adjusts river diversions at the headgate.

d. Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy. The spill will be measured by use of the measurement over the overshot weir gate. The PLC and data recorder will be able to record water depths over the gate, at this time communication is limited at the site with questionable cellular service. Future development of a SCADA system would include integration with other local structures, such as; the state of Wyoming flow measurement (0.5 Miles Upstream), and the river diversion (1.5 Miles upstream). Accuracy of the spill gate is estimated at approximately 8%, (6.4%-10% is typical for overshot gates according to Flow Measurement Using An Overshot Gate, B.T. Wahlin and J. A. Replogle, 1994)

The structure will be primarily constructed of reinforced concrete with steel and concrete amenities; such as the catwalk and safety railing. The gates for canal isolation and sediment management will be slide gates with electric actuators. The spill gate is scheduled for an Aqua Systems 2000, Langemann style overshot gate. The actuators will be solar powered electric gate actuators. Reference the attached concept design for better detail, noting that the long crested weir would ultimately be replaced by the automated spill gate, and the 10 x 6 Flush gate would be increased to approximately 16x6 Langemann Gate.

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

Annual canal downstream deliveries will be more regular and less than current deliveries. Flows that were previously discharged at spills further from the river will now be discharged directly to the river in real time.

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

The data recorder can be monitored and downloaded periodically for flow measurement.

E.1.2 B. Water Supply Reliability

As stated above this project is a major component of the entire Hanover Irrigation District. If it were to fail, 513 users covering over 20,000 acres would be without the water that gives them their livelihood.

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

The Cottonwood Spill and Check structures are important to each water user on the Hanover Canal, as well as the canals that finger out from the Hanover; Bluff, Upper Bluff and Highland Hanover. If this project is not completed, each user on EACH CANAL system will be impacted.

- Is there widespread support for the project?

There is widespread support for this project. The Worland area relies heavily on irrigation water for sustainability. Most residents make their living off the land, which in turn relies on irrigation water, due to a small amount of rainfall each year.

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

Hanover is currently providing water to the sub-canals, which are also working to improve their operations and infrastructure. Highland Hanover is in process of undergoing a Level I Study with the Wyoming Water Development Commission, and intends to pursue multiple Level III project. Upper Bluff is pursuing Level I study and Level III construction improvements, all water is sources from the Hanover Canal Diversions and flows through the subject Cottonwood structure.

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

Water users under the system are applying for and implementing on farm and off-farm improvements through private and USDA-NRCS funds. This structure provides water to those projects. Future potential for the canal operations are integrations of the proposed improvements on the Cottonwood structure with SCADA connected to the diversion and the measuring devices. Ultimately the SCADA system and controls could be integrated down canal to adjust for pump shutdowns and other spill locations.

- *Will the project make water available to address a specific water reliability concern? Please address:*

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

The threat of the aging infrastructure, interstate compacts, as well as diverting flows not necessary are all issues on the Hanover Canal and Big Horn River System. With infrastructure automation and measuring, repair and replacement, water can be conserved and more readily available for downstream water users, also allowing for better use of storage in Boysen reservoir.

- *Describe where the conserved water will go/how it will be used. Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)? Will it be left in the river system?*

The conserved water will be returned to the river system and when reservoir water is called less will need to be released allowing longer periods of use of stored water, as well as more water available to downstream water users.

- *Describe how the project will address the water reliability concern?*

The Cottonwood Check and Spill structures are both vital structures for the entire canal system. Once they are replaced and improved, HID will be able to better manage the canal and be prepared for sudden events.

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

Conserved water will be returned to the river system automatically

- *Describe the roles of any partners in the process. Please attach any relevant supporting documents.*

WWDC will be managing the use of the funds and ensuring that design, construction, and quality control/assurance standards are followed to ensure proper use of their provided funds. The Sub-canal provide funds to offset operational and capital costs of the Hanover canal, and are involved with the operations through at least the annual four-canal meetings.

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

- *Will the project benefit rural or economically disadvantaged communities?*

Worland, Wyoming has a population of 5,316 and is considered rural.

- *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance). Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.*

Based on the Master Plan Study, an extensive list of threatened and endangered species was reviewed and no impact was found to be had for normal canal operation nor construction. The list and site will be reviewed/inventoried before construction begins.

- *Will the project address water supply reliability in other ways not described above?*

E.1.3 Implementing Hydropower

This project does not involve Hydropower, however, through the water savings from infrastructure improvement water could be better stored in Boysen for power generation during short water periods. Also proposed improvements associated with other projects on Highland Hanover and Upper Bluff Canals, improvements to their pumping plants would allow improved energy efficiency, which is serviced by power generated at Boysen.

E.1.4 Complementing On-Farm Irrigation Improvements

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

- *Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.*

- *Provide a detailed description of the on-farm efficiency improvements.*
Currently Landowners are implementing conversion of flood to pivot, and converting conveyance ditches to piped transmission.
- *Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?*
YES, Currently Landowners are implementing conversion of flood to pivot, and converting conveyance ditches to piped transmission, with NRCS-EQIP and other program funding.

- *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.*
Documentation not available, but NRCS has and is providing cost share assistance
 - *Applicants should provide letters of intent from farmers/ ranchers in the affected project areas.*
- *Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.*
 - *Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?*
YES, indirectly it will complement the work being performed on farm. As on farm efficiency is improved spills and management of diversion will become more important and potentially more sporadic and inconsistent.
- *Describe the on-farm water conservation or water use efficiency benefits that would result from the on-farm component of this project.*
 - *Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*

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. 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.

E.1.5 Department of the Interior Priorities

5. 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 Cottonwood Spill projects directly supports the Department of Interior priorities. This project will modernize this 1955 structure that is extremely important to the Bureau of Reclamation sponsored districts and Hanover Irrigation District, to ensure water delivery to the American/Wyoming farmers and ranchers. We have completed all routine, minor and major maintenance events on the structure, though it has reached its intended useful life and has the opportunity to improve water use in its replacement. We will continue to follow proper maintenance schedules to ensure the upgraded structure maintains integrity for years to come.

E.1.6 Implementation and Results

CONFIRM WITH SANDY WHAT THEY HAVE IN PLACE.

E.1.6.1. Subcriterion F.1— Project Planning

Provide the following information regarding project planning:

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

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

Hanover Irrigation District has completed a Master Plan Study to ensure we have a solid roadmap to create an improvement schedule to ensure infrastructure is sound and water conservation is a priority. You may access this report at:

http://library.wrds.uwyo.edu/wwdcrept/Hanover/Hanover_Irrigation_District-Master_Plan_Level_I_Study-Final_Report-2017.html

This project directly reflects the State of Wyoming and Governor Mead's program, Leading the Charge: Wyoming Water Strategy, to ensure the State is focused on:

- Water Management
- Water Development
- Water Conservation & Protection
- Water & Watershed Restoration

E.1.7 Nexus to Reclamation Project Activities

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

- Does the applicant receive Reclamation project water?

Yes, HID coordinates with the Bureau of Reclamation for water volumes needed to be delivered in the river stored in Boysen Reservoir.

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

Yes, Boysen Reservoir is a Reclamation reservoir. Highland Hanover and Upper Bluff are reclamation constructed facilities, which receive 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 Wind River/Big Horn Basin.

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

With more efficient structures and less diversion, conserved water will stay in Boysen Reservoir. Spilled water will more directly contribute to river flows for down drainage Reclamation facilities such as Yellow Tail.

- Will the project benefit any tribe(s)?

No actual Tribes are on the Hanover Canal, but American Indian landowners are. Boysen reservoir is situated among tribal lands.

E.1.8 Additional Non-Federal Funding

The Hanover Irrigation District has already secured Non-Federal funding from the Wyoming Water Development Commission, for 66% of the previously proposed project cost. HID is responsible for the remaining costs, as well as any additional expenses arising from the project, or in preparation of the project such as permitting. The addition of the water measurement features and automation associated add to the previously proposed cost resulting in requested funds beyond the WWDC proposed 33% funding level

\$277,380- Wyoming Water Development Commission (Non-Federal Funding)

\$275,000- Reclamation Funding (Federal Funding)

(NOTE SF424C shows \$276,500, form would not allow decimal % of cost assistance)

\$ 620- (\$0 Target) Project Owner Funding- based on remainder of cost, though responsible for over runs & management/book keeping costs (Non-Federal Funding)

\$553,000(Total Project Cost)

Project Budget

Funding Plan and Letters of Commitment

Letters of Commitment

There are currently no Letters of Commitment, but we are under contract with Wyoming Water Development Commission for Level III Construction Funding for this project. It was approved in the 2018 Construction Bill for the State of Wyoming. The funding source is:

Wyoming Water Development Commission

Keenan Hendon, Project Manager

6920 Yellowtail Drive

Cheyenne, WY 82002

(307) 777-7626

Keenan.hendon@wyo.gov

Funding Plan

The Hanover Irrigation District Funding Plan is as follows:

- 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.

There are no outstanding funding requests.

FUNDING SOURCES	AMOUNT
Non Federal Entities	
1. State of Wyoming-Wyoming Water Development Commission	277,380
2. Hanover Irrigation District	620
3. Hanover Irr.Dist.-In Kind- Management/Administrative Not Quantified	
Non-Federal Subtotal	
Other Federal Entities	
1	
2	
3	
Other Federal Subtotal	
REQUESTED RECLAMATION FUNDING	

275,000

Budget Proposal

Reference 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:	Hanover Irrigation District, Level III w/ Watersmart	
Project Number:	18-XX (18WHC805)	
Prepared By:	Western Heritage Consulting & Engineering	
Concept Design:	Cottonwood Spill & Check Structure (HC-WW-001 & HC-CH-001)	
Preparation of Final Designs and Specifications		
Preparation of Final Plans & Specs:		
10% Design Document Contract Setup	\$	3,500.00
50% DD	\$	12,000.00
90% DD	\$	7,385.00
100% CD-Pre-Bid	\$	9,165.00
Post Bid & Staking	\$	4,910.00
Construction Inspection & Q/A	\$	38,340.00
AsBuilt	\$	7,540.00
Geotechnical Investigation	\$	5,500.00
	Task Total	\$ 88,340.00
Permitting		
WDEQ	\$	1,000.00
ACOE	\$	1,000.00
BOR	\$	5,000.00
NEPA	\$	15,000.00
SHPO	\$	20,000.00
	Task Total	\$ 42,000.00
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	\$	25,000.00
Demolition & Dispose of Old Structure	\$	25,000.00
Earthwork	\$	9,000.00
Erosion Control Rip Rap	\$	13,650.00
Structural Concrete-Formed Reinforces	\$	147,510.00
Catwalk/Drive Surface Decking	\$	7,500.00
10' Slide Gate - E Actuated 3 EA	\$	54,000.00
16' Langgeman Gate - E Actuated 1 EA	\$	82,000.00
Elect. Actuators,PLC & Measurement 3 EA	\$	50,000.00
4' wide Sediment Bypass Gate	\$	8,000.00
	Task Total	\$ 421,660.00
	PROJECT TOTAL	\$ 553,000.00

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).

Budget Narrative:

The cost budget for the project was developed by Western Heritage Consulting & Engineering during the Level I Master Plan Study to determine cost associated with structure replacement and improvements. The budget was updated to include additional costs associated with performing NEPA and SHPO surveys and compliance consultation. It is assumed that all works for the project will be subcontracted out to Construction Contractors and Design Consultants. Hanover Irrigation Districts contribution by the Board of Directors for management and oversight, as well as book keeping and payment processing is assumed In-Kind, though substantial amounts of time will be required.

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 and construction inspections. The design documents assume three submittals and review by WWDC project manager and Hanover Irrigation District, 10%, 50%, 90%. Then 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.

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 near full time observation activities by the design engineer staff. Also the HID 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 NEPA and SHPO were added as part of the WaterSMART application process assuming a wetlands survey would be needed for potential jurisdictional impacts, including coordination with the US Army Corp of Engineers local regulatory office/branch. 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 during the Level I Master Plan by 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 structure. Coordination with Aqua Systems 2000 was had to obtain realistic costs of installation of measurement controls and actuators, along with cost of Langemann style measurement gate.

The time period for cost estimation assumed winter of 2018 construction, though this could be and likely will be delayed to Winter of 2019,

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 adjacent to the Big Horn river and results in high ground water elevations, this is anticipated to require the need for construction dewatering during demolition of the existing structure as well as during construction of the foundation of the proposed structure. Dewatering activities will discharge flows down canal to contain discharges and any sediment/turbidity. Discharges to surface waters is not anticipated. Dust/air quality is not anticipated as surface and subsurface soil conditions are typically saturated or moist. Haul routes can be watered with water produced by dewatering activities if dust emissions become apparent. Construction activities will take place during winter months where season moisture is more frequent.

- *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.*

Indicators of wetlands are present at the location of the spill. Though limits of disturbance will be kept to a minimum, impact to these areas is anticipated/expected. A survey will need to be done to determine area of impact and jurisdictional status, as well as classification in accordance to the 1987 USACE manual and applicable regional supplements. It is anticipated that 0.05 Acres of potentially jurisdictional wetlands will/may be temporarily impacted by construction.

- *When was the water delivery system constructed?*

Some components and planning as early as 1904. Subject structure was modified 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 between 1904 and 1954, though exact date not definitively known. The structure was substantially modified by reclamation approximately 1954-1956, and subsequently modified approximately in 1990-2000.

- *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 Cottonwood structure has been modified by Reclamation/federal funds in the past.

- *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?*

- NO/None.

- *Will the proposed project limit access to and 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?*

NO/None.

Required Permits or Approvals

No external permits are foreseen, a dewatering permit may be required for construction activities, and 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.

Official Resolution

Reference following resolution:

RESOLUTION NO. 02-18

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

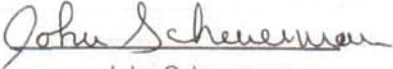
WITNESSETH

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

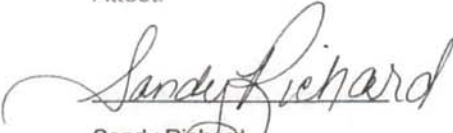
1. The Hanover Irrigation District Board desires greater operational efficiency within the Hanover Canal and authorizes staff to commit efforts and funds to undertake this endeavor. The budget shall not exceed X . The Hanover Irrigation District Board confirms they have the funds necessary for their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

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

PASSED, APPROVED AND ADOPTED THIS 7th DAY OF May 2018


John Scheuerman
District President

Attest:


Sandy Richard

Letters of Project Support
See following Letters of Project Support



May 4, 2018

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

To Whom it May Concern,

The Washakie County Conservation District (WCCD) supports the Cottonwood Spillway and Check Structure project of the Hanover Irrigation District, which is to replace a structure that is beyond its life expectancy; made of concrete, steel, and wood, installed in 1955.

This structure is the first return spillway back to the Big Horn River, downstream of the diversion dam, and WCCD believes that this proposed project would greatly improve water conservation and the efficiency of the whole system.

Agriculture within WCCD provides a consistent economic base for our local economies, with irrigated land valuations totaling over \$9.2 million dollars. It is important to WCCD in supporting any effort to improve water efficiency, especially if natural resource conservation projects can be initiated.

Please consider the approval of funding for the Cottonwood Spillway and Check Structure project.

Sincerely,

Victoria Dietz

Victoria Dietz, Director

208 Shiloh Road • Worland, WY • 82401

Phone: (307) 347-2456 ext. 101 • www.washakiecd.com

Working to Improve Our Quality of Life



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: Hanover Irrigation District, Big Horn Basin, Wyoming

Mr. Darren Olson:

I write this letter in support of the proposed project to replace the Cottonwood Spill and Check Structure for the Hanover 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 increase functionality, seepage and allow for efficiency. 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

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Michael D. Greear President & CEO
mgreear@wvosugar.com