

R21AS00300
WaterSMART Grants: Small-Scale Water Efficiency Projects
Department of the Interior
Bureau of Reclamation

Hooper Irrigation Pipeline Project

March 18, 2021

Hooper Irrigation District
5052 Road 197
Lewellen NE 69147

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Executive Summary

March 18, 2021

Hooper Irrigation District

Lewellen, Garden County, Nebraska

Category A applicant: Irrigation District

Hooper Irrigation Pipeline Project

Hooper Irrigation District is located north of Lewellen, Garden County, Nebraska, using water from Blue Creek, a tributary of the North Platte River in the Upper Platte Basin. The District proposes to convert 1.5 miles of open irrigation dirt canal located in sandy soil with 1.5 miles of buried PVC irrigation pipeline. The project includes nine metal risers and associated valve fixtures to connect to individual landowners for deliver. This pipeline will connect .3 miles of current pipeline that is the head of the access point of Hooper canal getting water from the Blue Creek Irrigation District canal and the existing cement lateral to the south of the district. The District has worked with the NRCS and the FSA to develop this proposed plan and will contract the work out. This pipeline is located entirely on private land and county right-of-way and will greatly improve the reliability of the water, the amount and pressure of the water to all farmer/operators, and the cleanliness of the water as farmers move to pivot farming – all the while reducing the cost and labor of maintenance and daily supervision of water. While costs are reduced, the project will increase land values and output. The project also helps with the general plan of the Upper Platte Basin Integrated Management Plan.

Estimated Project Start and Completion Dates: September 15, 2022 – May 30, 2022

Located on Federal Facility: No

Hooper Irrigation Pipeline Project

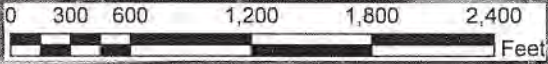
Project Location

The Hooper Irrigation pipeline will be located approximately 3 miles northwest of Lewellen in Garden County, in the southern part of the Nebraska panhandle. The Hooper Irrigation District is located in Township 16 N Range 42 W, located on the east side of Blue Creek in the Upper Platte Basin.



Legend

- PIPE_ALIGN
- perstrm100k_l_ne069
- canals100k_l_ne069
- street_dm_l_ne069



Sheet of _____ of _____

Drawing No. _____

File No. _____



Natural Resources Conservation Service

PLAN
HOOPER IRRIGATION DIST.
GARDEN COUNTY, NEBRASKA

Designed	CHRIS JENSEN	Date	4/17/2020
Drawn	Chris Jensen		4/17/2020
Checked	_____		
Approved	_____		

PROJECT DESCRIPTION

History and challenges:

Hooper Irrigation District uses water from Blue Creek, supplied by springs from the Ogallala aquifer in the Nebraska Sandhills. Ditch rights date from Sept. 7, 1893 and the Hooper Irrigation District was formed by the Garden County Commissioners on June 7, 1926. Hooper covers 842 acres providing 1 cfs/70 acres with a maximum of 12.03. There are currently four Irrigation Districts using water from Blue Creek, two on the west and Hooper and Blue Creek Irrigation Districts on the east.

Hooper Irrigation District is a small district with 13 landowners. An open canal system developed in the late 1890's is inadequate to meet the water supply needs using 21st century farming practices. The number of landowner farmers is decreasing while the number of non-resident owners and non-resident operators is increasing. The amount of acres farmed by one operator is increasing with a corresponding decrease in time allowed for each acreage. Farmers are replacing concrete laterals and gated pipes with gated pipes with surge and pivot irrigation often operated with phone apps. Cost margins are small and labor at a premium.

This 1.5 mile stretch is a high maintenance canal running through several fields and even has a quarter mile stretch lined with trees that can't be burned or sprayed. Gone are the days when anyone is willing to walk along a ditch and remove weeds with a pitchfork.

Because of the size of the district it is difficult to fund improvements without grant funding.

Proposed pipeline:

Scope of work: Hooper Irrigation District is applying for funds to convert 1.5 miles/7,933 feet of open irrigation earthen canal to a buried PVC irrigation pipeline to increase the amount and reliability of water for area farmers and to decrease the cost and challenges of maintenance. The pipeline will connect the south end of the current .3 miles of existing pipeline upstream to a cement lateral on the south end – the east line of Section 18-15-42.

The proposed project has been developed with Chris Jensen, NRCS civil Engineer, and Dave Cook, USDA Farm Service Agency. John Berge with the NPNRD was also consulted.

The proposed project includes

PVC: Plastic Irrigation Pipe – 15 inches – 80 psi rating	2116 feet
PVC: Plastic Irrigation Pipe – 12 inches – 80 psi rating	2855 feet
PVC: Plastic Irrigation Pipe – 10 inches – 80 psi rating	2962 feet

9 metal risers and associated valve fixtures to connect to landowners laterals

5 road crossings

3 cement ditch crossings

Modification of easements: The proposed pipeline will continue to be located on property of the same landowners as the current canal. The pipeline will run parallel to the current canal in the northern section. The middle section will change the canal from the east to the west side of the county road. The final section will eliminate the canal going through a field to the south, replaced with a canal along the county road. The landowners have been requesting this change since 2017. New easements will be finalized for this work.

Contract: The entire project will be accomplished by letting bids and contracting for a construction company to build the pipeline and risers and manage land access and rights. It is anticipated that the pipeline company located in Julesburg, Colorado will provide the lowest bid as they are located 30 miles from the project and will not have excessive costs for transporting equipment and housing staff. Final bids will be requested following grant approval.

EVALUATION CRITERIA

Project Benefits

Water supply delivery system:

- The replacement pipeline will **connect to existing improvements** in the delivery system by connect existing pipeline to a pipeline to the north and a cement lateral to the south.
- The **labor required for canal management will be greatly reduced** ending the need for annual maintenance such as burning, spraying and cleaning ditch bottoms, as well as on-going operating maintenance of watching and correcting flooding from gopher runs and overuse of water, cleaning obstacles out of the ditch and controlling aquatic plant growth. Due to limited funds, the district voted to have farmers jointly provide maintenance on the ditch including burning weeds, dredging the ditch, spraying for weeds and in one section removing weeds with a pitchfork by hand as trees prevent burning. Due to problems with weeds and moss or erosion of ditch banks the farmer has to check the canal 2 to 3 times per day. Larger maintenance work is done by contract.
- **Reduction in liability and conflict from burning and spraying, flooding and land access.** On one farm, for example, the owners are unhappy about the ditch running through the middle of their field resulting in burning and spraying issues with crops, weeds growing along the ditch, piles of dirt from dredging that harm their combine, and flooding of their yard and field. Other conflicts have arisen over the length of time it took to get water in the spring due to slow canal maintenance resulting in a lost crop and a law suit over damage with flooding in 1987.
- **Conflict over amount of water** results from loss of water through seepage, which is estimated to be between 50 and 90% of inflows.

Reliability

Reliability is a critical component of keeping the irrigation surface water used in changing farming methods and **enhancements made by landowners**. Many landowners have converted to gated or pivot irrigation systems and several have added pipelines on their property to replace dirt or cement laterals.

Irrigation water that flows through a dirt canal is often full or plugged with weeds and moss and sediment and has no pressure. Pivots may generally take relatively clean water and 40 pounds of pressure. This is possible with irrigation provided through pipes. The specific benefits of a pipeline replacement for the 1.5 miles of dirt based ditch are:

- **Consistent pressure** of water at about 20 psi.
- **Capacity to provide clean water** for pivot irrigation
- The amount of water and pressure can be **consistently delivered for the majority** of operators regardless of the distance from the head gate, allowing more consistent flow downstream. This is especially a benefit for those using pivots or gated pipes. Acres south of Highway 26 are at a distinct disadvantage for getting adequate water delivered.
- **Reduction of water absorption/seepage** in a canal with sandy soil allows more water to be delivered to the field.
- Efficient use of water during **periods of drought**.

Geographic scope – Upper Platte Basin Plan

- As part of the Blue Creek water supply, Hooper is in the **Upper Platte Basin** and plays a significant role in the past over appropriation of water. It is part of the hydrologically connected groundwater of the Upper Platte Basin. The NPNRD has been able to effectively reduce over appropriation by working with irrigation districts. For example, in 2017, a landowner leased 51 acres of the Hooper Irrigation District to NPNRD.
- The **challenge between surface and well water/groundwater** is mixed. Pipelines reduce the amount of water seepage and evaporation but also increases the efficiency of water use, returning more water to the river while serving farmers' needs.
- Currently **pivot irrigation systems require excess water** to maintain sufficient pressure and flow to maintain steady pivot operation. Excess water flows into pastures or fields the end of the canal since the Hooper canal does not connect to the river. With a pipeline, less water will need to be diverted and water that remains in the Blue Creek canal can be returned to the river.
- Efficient use of water contributes to the **Drought Mitigation Plan**.
- Diverting less water while still delivering critical levels of water to farmers provides **water for habitat, fisheries and river obligations**. Water in the Blue Creek canal returned to the river also adds to water quality by flushing the canal.

Collaboration and information sharing among water managers

- The replacement of an open canal with a pipeline will make it easier for district farmers to manage and agree on water delivery.

Local sectors and economies – agriculture, environment, recreation, tourism

- **Cost of maintenance and management of the irrigation district will decrease**
- **Increased value of irrigated acres** of land for landowners if water delivered by pipe
- **Capacity to irrigate using current farming practices**, including gated pipes and pivot systems – resulting in the ability to farm more acres or to be able to contract with a farm operation for small acreages. For example, two landowners have been challenged to find an operator for their small acreages. On one small 30 acre pivot the operator lives 20 miles from the land.
- **Higher lease rates** if irrigation water through pipe
- **Increase in yield** with more reliable irrigation and removal of open canals from fields
- **Significant reduction of cost of irrigating** if using pipe water with head/pressure rather than cost of pumping from well Increase in the benefits of using surface water over well water for landowners/operators. The cost of pumping water from a pipeline is a fraction of the cost of pumping water from a well that might be 200 feet of rise.
- **Reduction of labor costs for farmer/operator**
- Increase of water returned to stream by efficient water use **benefits wildlife, recreation and tourism** with Clear Creek Wildlife Refuge and Lake McConaughy about 10 miles downstream
- Reduced ground water demand if farmers/operators use Hooper surface water rather than wells for pivots.

Coordination with NRCS – on-farm efficiency work completed or anticipated

- Two land owners added pipeline from the irrigation canal to their land. Both landowners privately paid for the pipeline.

Planning Efforts Supporting the Project

Goal or need identified in planning effort

Local planning: During the last thirty years the Hooper Irrigation District has engaged in a planning process and made improvements to the district.

Hooper Irrigation District originally operated a separate head gate to divert water from of Blue Creek. In 1993 the Hooper Irrigation District contracted with the Blue Creek Irrigation District to divert water for the Hooper and deliver the water through its canal to a new pipeline, approximately .3 miles long, constructed southwest from the Hooper delivery structure on the

Blue Creek Canal to an outlet near the midpoint of the NE ¼ of Section 7-16-42. This eliminated the Hooper head gate and ¾ mile of Hooper canal.

In 2003-04, engineers designed a plan to replace earthen canals with pipeline. This planning process progressed but was finally set aside due to funding issues with the small tax base of the district.

The intake structure originally drew water from the bed of the Blue Creek Canal. Consequently, transport of bed-load sand and sediment into the District's system was an ongoing problem. In an effort to reduce the transport of sand and sediment, the District completed modifications in 2009 to the delivery structure so water is drawn from higher in the flow stream of the Blue Creek Canal.

Area planning:The four irrigation districts using water from Blue Creek have coordinated with NRCS for many years including. Many land owners have property in two or three districts. Jointly, these districts accomplishments are:

- Combining Meeker Irrigation District into the Blue Creek Irrigation District, eliminating a head gate and using Union Pacific funding to install irrigation pipeline for a much shorter distance resulting in reduced cost and maintenance
- Combining Hooper and Blue Creek Head Gates and upper ditch
- Improvements to the Hooper outlet with .3 miles of pipe and flume
- Installation of pipelines on the Paisley and Union upper canals
- Engineering plans for pipelines for Hooper initiated in 2003
- Irrigation acres have been reconfigured for at least three pivots

Regional planning: In September 2004 the **Upper Platte Basin** watershed including the North Platte River and Blue Creek was determined to be over appropriated by the Nebraska Department of Natural Resources and a stakeholder driven basin-wide plan (state and local) was adopted in 2009. The basin includes a larger area of over appropriated surface water and the hydrologically connected groundwater area. The **NPNRD Integrated Management Plan** The first goal of the plan is to incrementally achieve and sustain a fully appropriated condition and the fourth goal is to work cooperatively to identify and investigate disputes between ground water users and surface water appropriators. *Goal 1, Objective 1: Offset impacts of streamflow depletions to (A) surface water appropriations and (B) water wells constructed in aquifers dependent upon recharge from streamflow, to the extent those depletions are due to water use initiated after July 1, 1997. Measures that can potentially be used to overcome the adverse effects of increases in consumptive use on streamflows include both those that reduce intentional consumptive use and those that enhance existing water supplies in other ways, or that increase the ability to use existing supplies more effectively.*

The surface water rights in the area are much older than the groundwater well rights. A number of farmers in the area have added wells to their property so that they don't need to

use surface water or have a back-up if surface water is not available. Installing a pipeline makes the available water more conducive to pivot irrigation and can help increase the amount of surface water being used as opposed to groundwater.

Pivot irrigation is far more efficient in water use, keeping more water available for other purposes such as downstream habitat or irrigation. Farmer operators will be more likely to use pivot irrigation with a pipeline.

Drought Mitigation Plan 2017 The pipeline contributes to the plan: Vulnerability and Impact Water quantity Goal 1 : Identify strategies to address streamflow variability specifically working with irrigation districts.

Determined as a priority over other possible projects

2003-04 Hooper Irrigation District determined that the addition of a pipeline from the existing .3 pipeline diverting water from the Blue Creek Irrigation District canal to the cement lateral located 1.5 miles south, is the priority for the district. At the time the board worked with NRCS, the FSA. Olsson Associates, Engineers, created an initial design for improvements to install pipeline to replace the current dirt canal. Unfortunately this was not able to be completed as landowners would not agree to the cost.

This year the board again voted to pursue grants to help fund the project.

Project Implementation

The Hooper Irrigation Pipeline project will be overseen by the board chairman, Bruce Burdick, with grant reporting and financial management from the Secretary/Treasurer Tara Canning. The entire project will be completed through a contract with a pipeline installation company. The contracting company is responsible for permits, final engineering and design, construction and sub-contracting risers, oversight and guarantee of work.

Project Schedule

September – November 2021	Easements completed with landowners Formal bids from at least 2 contractors
January 31, 2022 February 2022	Approve bid for construction Permits from Garden County Plan with Garden County Transportation Office for access across county roads
March – April 2022	Construction of pipelines Construction of risers and valve fixtures
May 2022	Verification of system for irrigation/water flow

Hooper Irrigation Pipeline Project

Budget Item Description	Computation		Recipient Funding	Reclamation Funding	Total Cost
	\$/Unit And Unit	Hours			
Salaries And Wages (District contract)					
Project Coordinator (1 Employee)	\$40.00/hr	520 hr	\$ 10,000		\$ 10,000
Office / Clerical (1 employee)	\$15.00/ hr	100 hr	\$ 1,500		\$ 1,500
Travel					
Project Coordinator \$.56 per mile	\$.56	200 miles	\$ 112		\$ 112
Contractual / Construction					
7933 feet pipeline, 9 risers and valves with connecting access to laterals across county road			\$ 118,054	\$ 75,000	\$ 193,054
Environmental And Regulatory Compliance					
			\$ -	\$ -	\$ -
Other (Land easements, Legal)					
			\$ 1,500		\$ 1,500
Total Direct Costs			\$ 131,166	\$ 75,000	\$ 206,166

* District Owned Equipment

Funding plan

Hooper Irrigation District is applying for a \$75,000 WaterSMART grant which represents 36.4% of the total project expense and a Nebraska NRC Water Sustainability grant. The NRC application is due in July 2021 and requires a 40% match.

\$ 75,000	WaterSMART grant
\$120,000	NRC Water Sustainability Fund
<u>\$ 11,166</u>	Hooper Irrigation District
\$206,166	Total Budget

Budget narrative

Contractual - Management Contract:

Project coordinator for contracting process and oversight \$40 per hour x 250 hours = \$10,000. Bruce Burdick, Hooper Irrigation District president has agreed to manage the project as an inkind contribution.

Office/clerical for accounting and grant reporting processes \$15 per hour x 100 hours = \$1,500

Travel

Project coordinator mileage for oversight \$.56/mile x 200 miles = \$112 (federal rate)

Contractual - Construction

Construction of project including complete process – engineering, permits, coordination with Garden County Transportation, construction of pipeline and risers, purchase of pipe and fittings, crossing county road and cement ditch crossings. \$193,054 (based on estimate from Blochowicz Ditching Inc.)

Environmental and Cultural Compliance

Instructions provided during a web presentation indicate that grantees do not need to include this as a budget item.

Other (Land easements, legal)

The new pipeline will parallel the existing canal to the north and will change locations to different landholders to the south. New easements will be needed for three landowners and all have agreed to the changes.

ENVIRONMENTAL AND CULTURAL COMPLIANCE

The Hooper Irrigation Pipeline project will primarily replace open canals with buried pipeline with a few changes to follow the county road or change sides of the county road. It is anticipated that there will not be serious environmental and cultural impacts from the project. If funded, the Hooper Irrigation District will work with the Bureau of Reclamation to meet requirements.

REQUIRED PERMITS OR APPROVALS

The contractor is responsible for permits which are required by Garden County. There are no fees associated with the county permits. No other permits are required.

Unique Entity Identifier and system for Aware Management

Hooper Irrigation District applied for an EIN in February 2021. As soon as the EIN is received, the district will apply for a DUNS number and register with SAMS.

OFFICIAL RESOLUTIONS

The Hooper Irrigation Board met March 10, 2021 and passed a resolution to complete the pipeline project depending on adequate funding. Minutes attached.

Conflict of Interest/Lobbying/Single Audit

There are no anticipated conflict of interests in contracting this project. The board member who will provide general oversight for this project is making an inkind contribution of time. Grant funds will be used to construct a pipeline and risers.

The board will not use any funds for lobbying.

The total federal funds used by the Hooper Irrigation District will be \$75,000 if the grant is awarded and the district will not be subject to a single audit.

Hooper Irrigation District
Closed Special Board of Directors Meeting
March 9, 2021
Lewellen, NE

Bruce called the meeting to order at 12:58 pm.

Roll Call: Bruce Burdick, Ruth Hamilton, Larry Johansen, Tara Canning, Jean Jensen

A quorum was established.

Larry nominated Bruce to be the President. Ruth 2nd; all aye; motion carried.

Jean reviewed the Grant and where we are at with submitting. The current budget set for the project is \$194,112.00.

Larry made a motion to pass a resolution to approve the pipeline project of 1.5 miles within the Hooper Irrigation District in Garden County, NE. Ruth 2nd; all aye; motion carried. (Attached in the map of the project)

Bruce made a motion to pay the secretary the current state mileage rate and an hourly wage per meeting and 1 hour of drive time. Larry 2nd; all aye; motion carried.

Larry made a motion to adjourn at 2:02 pm. Ruth 2nd.

Respectfully submitted,



Tara L Canning, Secretary

BLOCHOWITZ DITCHING, INC.
 16190 CR 41
 JULESBURG, CO
 80737

Estimate

Name/Address
HOOPER IRRIGATION DISTRICT C/O BRUCE BURDICK 5052 RD 197 LEWELLEN, NE 69147-3027

Date	Estimate No.	Project
03/10/21	25	

Item	Description	Quan	Cost	Total
PIPE	PER FOOT--15" 80# PIPE & INSTALL	2,116	16.88	35,718.08
PIPE	PER FOOT--12 80# PIPE & INSTALL	2,855	12.49	35,658.95
PIPE	PER FOOT--10" 80# PIPE & INSTALL	2,962	9.09	26,924.58
RISERS/VALVES/FITTINGS & LABOR	FITTINGS/VALVES/FITTINGS & LABOR	9	7,194.73	64,752.57
ROAD CROSSING	ROAD CROSSING	5	3,227.70	16,138.50
CEMENT DITCH CROSSINGS	CEMENT DITCH CROSSING	3	3,370.00	10,110.00
				0.00
				0.00
	PIPE & FITTING PRICES ARE SUBJECT TO CHANGE AT THE TIME OF ORDER ***PVC MARKET VERY VOLITAL AT THIS TIME***			0.00
MISCELLANEOUS	SALES TAX @ 5.9%	1	3,751.33	3,751.33
	TAXABLE ITEMS		6.90%	0.00
		Total		\$193,054.01

			Planned		
Cooperator	HOOPER I.D.		Project	PIPELINE	
Calculations done by	CJ		Date	4/17/20	
Calculations checked by			Date		
Pipe Material	Nominal Pipe Diameter, inches	Pressure rating, psi	Length, feet	Pipe Weight, pounds per foot	Pipe Weight (pounds)
PVC: Plastic Irrigation Pipe (PIP)	15	80	2116	9.17	19,400
PVC: Plastic Irrigation Pipe (PIP)	12	80	2855	5.82	16,605
PVC: Plastic Irrigation Pipe (PIP)	10	80	2962	4.04	11,959
Total Weight of PVC					47,964
Cost per pound				\$	3.75
Total Cost				\$	179,864.22