WaterSMART Grants:
Water and Energy Efficiency Grants for Fiscal Year 2021

Superior Canal Delivery Efficiency Improvement Project

Enhancing Storage in Harlan Reservoir by Adding High-Efficiency Diversions for Superior Canal

Application for Funding Opportunity Announcement No. BOR-DO-21-F001, Fiscal Year 2021

By

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Nebraska Bostwick Irrigation District

Superior Canal Delivery Efficiency Improvement Project

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Date	September 16, 2020
Applicant Name	Nebraska Bostwick Irrigation District
City, County, State	Red Cloud, Webster County, Nebraska
Project Name	Superior Canal Delivery Efficiency Improvement Project

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Project Name: Superior Canal Delivery Efficiency Improvement Project

The Bostwick Irrigation District in Nebraska, also known as the Nebraska Bostwick Irrigation District (NBID), located in south-central Nebraska, is pursuing a collaborative effort to improve the efficiency of agricultural water deliveries within the lower portion of its Superior Canal service area. Working with the State Department of Natural Resources (NeDNR) and the locally-based Lower Republican Natural Resources District (LRNRD), in coordination with the U.S. Bureau of Reclamation (Reclamation), NBID will construct two new diversions for the lower Superior Canal, near the community of Superior, Nebraska, using a series of gallery wells with SCADA-enabled operations, allowing for more efficient and responsive water management in this portion of the Republican River Basin. Quantitatively, the actions are expected to result in a reduction in over 3,000 acre-feet/year of river diversions, conserving around 3,400 acre-feet/year of storage supplies in Harlan County Reservoir that otherwise would have to be released for downstream Superior Canal diversion. The first phase of an innovative conjunctive management

initiative in the Lower Superior Canal, this project brings together entities that only a few years ago were locked in costly and time-consuming litigation against one another, developing and improving water infrastructure for the benefit of drought resiliency, agricultural water supply reliability, enhanced recreational opportunities, and many other local and regional benefits. The project also builds upon a multi-year, three-state, effort by the states of Nebraska, Kansas, and Colorado, to more effectively manage the operations of Harlan County Reservoir and the overall water supplies of the basin, with the goal of improving the flexibility and reliability of Republican River Compact (Compact) compliance activities for all three states and the various federal and local water interests in the basin.

The Superior Canal Delivery Efficiency Improvement Project (Project) represents the first phase in a larger effort to improve water supply reliability and water efficiency in the Lower Superior Canal system. Future phases will consider additional conjunctive management options related to groundwater and surface water use while enhancing aquifer storage in the lower Superior Canal system. NBID has also expressed an interest in expanding its network of remotely operated check gates, managed by its Rubicon network system, and these efforts may be linked to work in tandem for optimal water management effectiveness.

Length of Time and Estimated Completion Date: It is anticipated that the two new diversions and associated pipelines can be completed within 3 years of the time that grant funding is awarded. Assuming that the Project may commence in October 2021, construction should be completed by October 1, 2024.

Proposed Project Location Relative to Federal Facility: The Project would include a new diversions and pipelines that would be connected to the Superior Canal, a component of the Bostwick Division of the U.S. Bureau of Reclamation's Missouri Basin and Arkansas-Rio Grande-Texas Gulf Region. Lands serviced by the Superior Canal would also be included within the Project location.

Project Location

The Superior Canal Delivery Efficiency Improvement Project is located in Nuckolls County, Nebraska, and includes lands to the south and east of the community of

Superior, Nebraska, as shown in Figure 1. The Project includes lands under the Nebraska Bostwick Irrigation District, which is headquartered in Red Cloud, Nebraska. Roughly 540 acres and 3,500 acres are serviced by NBID in the "South of Superior" and "East of Superior" regions, respectively. The geographic extent of the Project is roughly bounded by 40°02'N latitude to the north and 40°00'N latitude to the south, and 98°06'W longitude to the west and 97°56'W to the east.

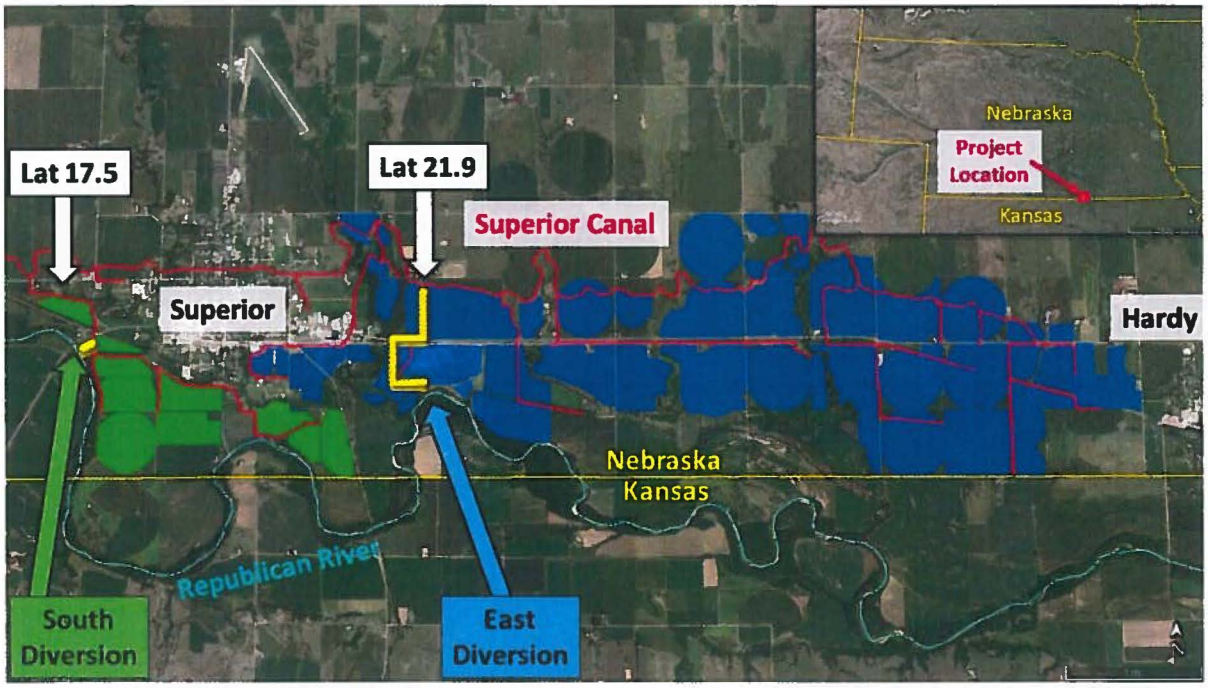

Figure 1: Location of Project Features

Technical Project Description

Background Information

The Superior Canal Delivery Efficiency Improvement Project is designed, as its name suggests, to improve the efficiency of water deliveries within the lower-most portion of the service area for Superior Canal, a canal operated and maintained by NBID. The Superior Canal is one of the key components of the U.S. Bureau of Reclamation's Bostwick Division, which extends from Orleans, Nebraska, to Concordia, Kansas, and includes Harlan County Dam and Lake on the Republican River, Lovewell Dam and Reservoir on White Rock Creek, and the Franklin, Naponee, Franklin Pump, Superior,

and Courtland Canals, along with other associated pumping plants, laterals, and drains. Altogether, the features within the Division contribute to the irrigation of around 65,000 acres across seven counties and two states, under the operation of NBID and the Kansas-Bostwick Irrigation District No. 2 (aka Kansas Bostwick Irrigation District, or KBID). The Nebraska portion of the Bostwick Division, which includes about 22,400 of those acres with service available, is in turn divided into two separate "units": the Franklin Unit, with includes Franklin, Naponee, and Franklin Pump Canals; and the Superior-Courtland Unit, served by the Superior and Courtland Canals. The Superior and Courtland canals share a common primary diversion point at the Superior-Courtland Diversion Dam, located around 50 miles downstream of Harlan County Dam, and about three miles west of Guide Rock, Nebraska.

The Superior Canal, located entirely within the State of Nebraska, stretches approximately 30 miles from the diversion dam east towards the state line, irrigating over 6,000 acres over the lands on the north side of the Republican River, before ultimately terminating just west of Hardy, Nebraska. On the upper end, the headgates for Superior Canal includes a six- by ten-foot radial gate, with a discharge capacity of around 140 cfs. From the headgate, the Superior Canal meanders east, and includes 21 check structures, 16 laterals (15 of which have been converted to buried pipe), and 5 wasteways (two of which are actively used: one at Oak Creek and a gaged terminal wasteway just west of Hardy). Construction of the Superior Canal took place over the 1949 to 1953 period, with some initial irrigation service beginning in late 1951.

As shown in Figure 3, a large portion of the irrigated lands serviced by the Superior Canal is located toward the downstream end of the canal. This lower portion of the canal has been divided, for the purposes of this project, into two separate target areas: the South of Superior Area (immediately south of the Community of Superior) and the East of Superior Area (including all lands serviced east of the Community of Superior). These lands, which include about 540 acres and 3,500 acres, respectively, require additional river diversions to overcome the canal losses, with average losses of about 3,600 acre-feet per year from 2008 to 2019 out of a total of about 6,500 acre-feet/year of river diversions at the canal headgate.

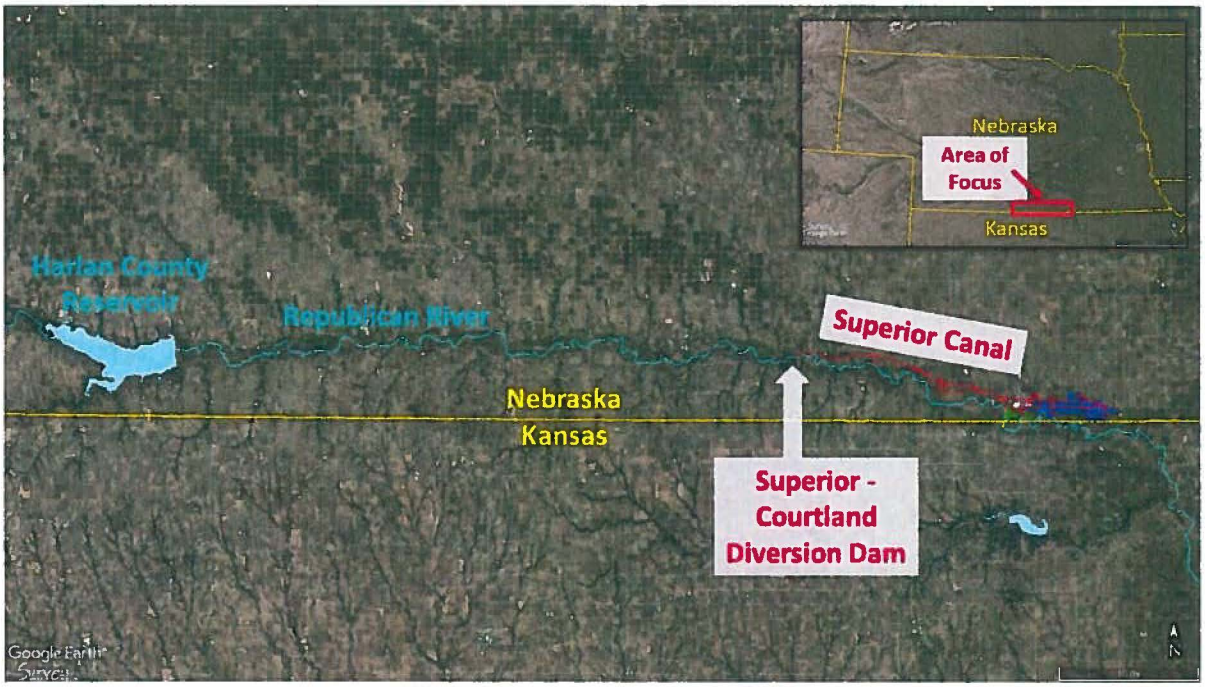

Figure 2: Harlan County Reservoir and Superior Canal

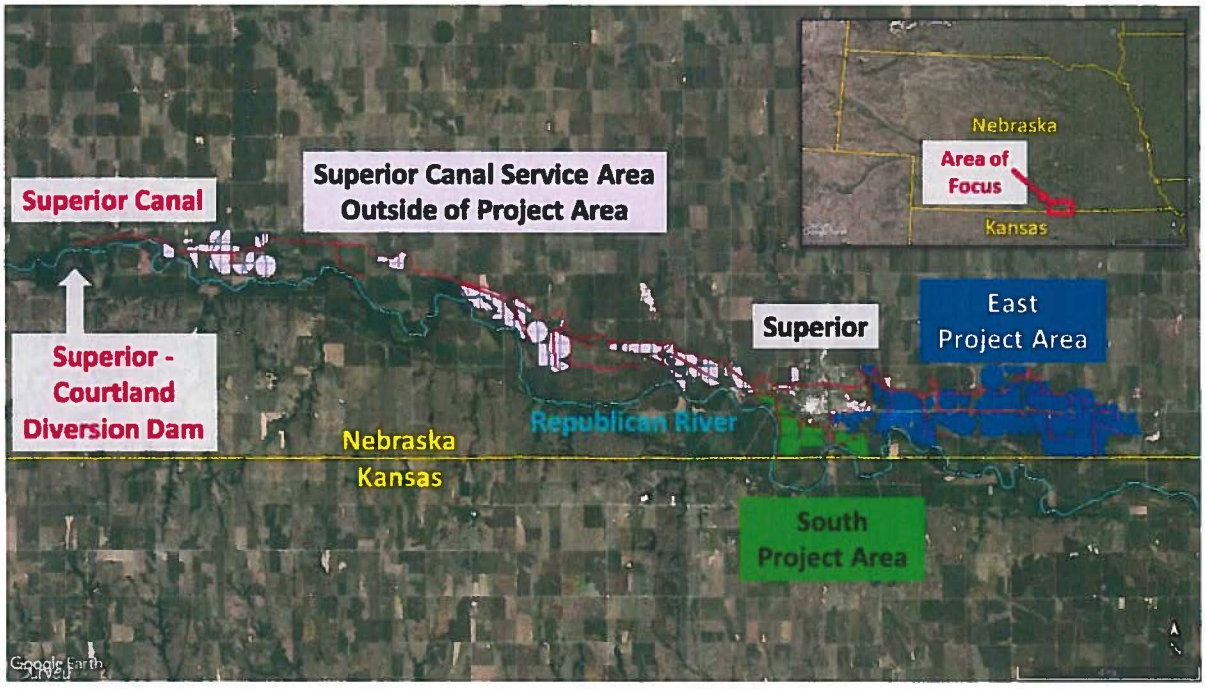

Figure 3: Superior Canal Service Area

Water supplies for the Superior Canal can currently originate from one of two primary sources: releases of stored water supplies from Harlan County Lake, and natural flow diversions from river gains produced in the Republican River. Seven separate natural flow appropriations are active for the Superior Canal, with appropriation priority dates ranging from 1946 to 1982, totalling over 45 cfs. Regardless of the source, diversions for Superior Canal are made at the Superior-Courtland Diversion Dam, and are measured by NBID staff and reported to the Bureau.

Before outlining the details of the Project's key components, one important related feature of the NBID water management system today is its Rubicon Water Network Control system, which is currently being developed to work in conjunction with new automated checks on the Franklin Canal system via a SCADA system managed at NBID's headquarters in Red Cloud, Nebraska. A Total Channel Control (TCC) system will integrate with the automated gate system, directing the gate operations to reduce spills and improve overall canal efficiencies. Besides the Franklin Canal infrastructure, the Rubicon Water Network Control system is also being linked to the headgates for the Superior Canal and the Courtland Canal. A WaterSMART Water and Energy Efficiency Grant awarded to NBID for FY 2020 will add automation at the Superior Canal and Courtland Canal headgates, and will integrate these headgate operations into the SCADA system. The Rubicon Water Network Control system is designed to be expandable, so that it may incorporate additional infrastructure into its smart network over time. Part of the components for this current, FY 2021, application involves integrating the proposed new diversion into the Rubicon SCADA system, so that operation of the gallery wells that make up the diversion can be managed and optimized directly from NBID Red Cloud headquarters, as described in more detail below.

Another important aspect of current operations involves the limitations experienced in the Project area due to its geographic location and the constraints associated with manual gate operation. As mentioned earlier, the Superior-Courtland Diversion Dam is located about 50 miles downstream of Harlan County Reservoir along the Republican River, and the Superior Canal is around 30 miles long in total. Any releases of water from Harlan County Lake to the Republican River for subsequent use in the Project area must flow through a distance of up to 80 miles before reaching the farm turnouts, a process which can involve several days of travel time, resulting in high water losses. NBID will typically make a daily request to the Bureau during the irrigation season as to what, if any, storage supply from Harlan County Lake that it would like released for use in its canal system. NBID water managers overseeing the Superior Canal are faced

with the uncertainties of future weather conditions, future water demands, fluctuations in river flows and elevations, and the impacts from operational changes on the Courtland Canal diversion, when making diversion decisions at the canal headgates. The current manual gate system for the Superior Canal headgates limits the ability of NBID to optimize diversion amounts to best meet the demands downstream in the system. Completion of the automated Rubicon system will improve this situation, as would automation of downstream check structures on the Superior Canal – the latter of which is being considered as a future objective for the District. But the current situation lends itself well to new projects, such as the one in this application, that provide an alternative diversion point closer to the point of ultimate farm deliveries.

Project Description

To improve the delivery efficiency of the Superior Canal, this Project considers the development of two new river diversions, serviced by gallery wells, near the north bank of the Republican River, and associated connecting pipelines to link those wells with the existing Superior Canal system. The resulting improvements will provide a more efficient way to deliver water supplies to the irrigated acres within this lower portion of the Superior Canal, while enhancing water storage in Harlan County Reservoir upstream.

Focusing first on the South of Superior Area, as shown in Figure 4, the Project includes two 2,500 gpm pumps located on the left (north) bank of the Republican River near the Highway 14 bridge south of Superior. These 18-inch diameter cased and screened wells, with corresponding variable drive motors and controls, would include smart Modbus-based devices connected directly to the contacts on the motor start boxes, serving as an interface to Rubicon remote pedestals that communicate with the Rubcion server in Red Cloud via a licensed radio signal. Water would then be pumped into a 16-inch diameter PVC C905 pipe for approximately 700 feet to the northeast, eventually connecting with the now-buried Lateral 17.5 pipeline. This pipe services most of the acres south of the Community of Superior, and currently branches off of the main Superior Canal at the lateral turnout at Station 926+55. The two pumps are capable of delivering 5,000 gpm, or approximately 11 cfs, at full capacity. Discussions with NBID staff indicate that 10 cfs should be sufficient to service the lands in the South of Superior Area.

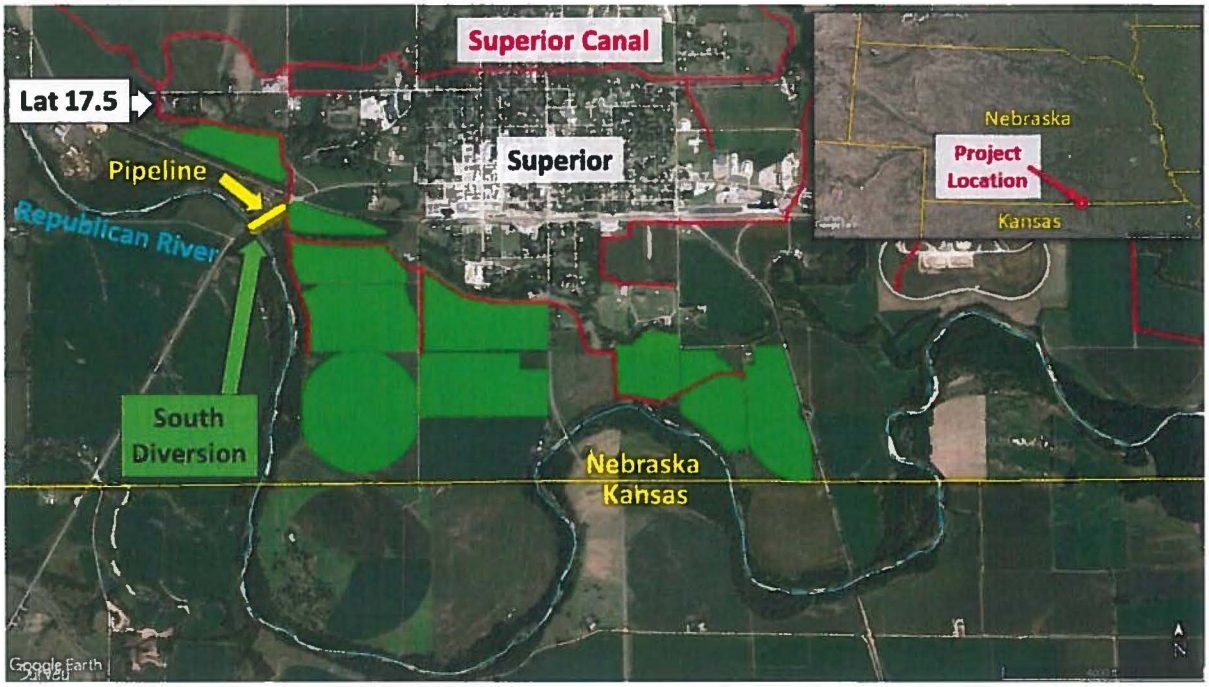

Figure 4: South of Superior Area

Turning now to the East of Superior Area, as shown in Figure 5, the Project includes six 2,500 gpm pumps located on the left (north) bank of the Republican River near the confluence with Oak Creek, just south of Aurora Cooperative's "Superior East" grain facility southeast of the Community of Superior. As with the South of Superior Area, each well would use an 18-inch diameter casing and screen, with variable drive motors and controls, and SCADA connections with the Rubicon server. The combined flow capacity of these wells would be 15,000 gpm (about 33 cfs). The flow rate would be measured using new flow meters, similar to the South of Superior setup. Once flows from the wells are accumulated, the pumped water will travel through a 7,100 ft PVC C905 pipe, of 32-inch diameter, following mostly north along the line of Lateral 21.9 (now buried pipe) to where the lateral branches off the main Superior Canal's Station 1205+42, which is just east of Road 3750. The piped water would be discharge into the Superior Canal via a junction box on the south side of the canal.

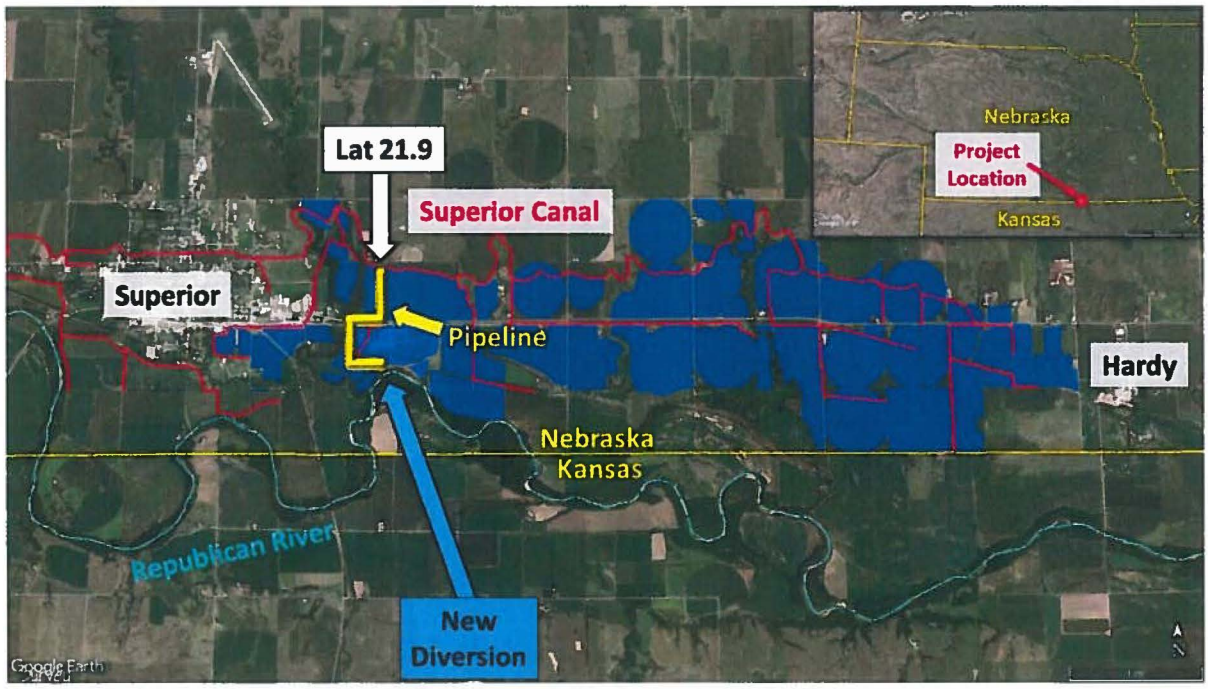

Figure 5: East of Superior Area

As mentioned earlier, both of the new well gallery diversions would be incorporated into the Rubicon Water Network Control system via a combination of individual Modbus interface devices and Rubicon remote pedestals. This virtual control would allow near-instantaneous adjustment of pumped volumes, greatly improving both the timing and precision of deliveries for the South and East of Superior Areas. Easement considerations would be minimized by following existing lateral easement lines along federal and state property, with minimal private easement arrangements needed for the East of Superior Area – in that single case likely involving an NBID irrigator.

The resulting infrastructure improvements are estimated to result in annual diversion reductions of over 3,000 acre-feet per year, which should in turn result in additional supplies for Harlan County Reservoir on the order of 3,400 acre-feet per year. Canal losses could drop by up to 2,300 acre-feet per year, while canal efficiencies should improve from the current value of around 32% to around 63% under the Project.

Ownership of the new pipelines and diversion well galleries will be assigned to NBID, with appropriate easements obtained for construction activities and the well and pipeline infrastructure components.

Evaluation Criteria

E.1.1. Evaluation Criterion A—Quantifiable Water Savings (30 points)

This project represents an aggressive modernization of existing water infrastructure that has been in place for around 70 years, with a clear connection to resulting water use efficiency improvements and significant, quantifiable water savings. Its major components include updated diversion structures and piping alternatives to reduce canal losses, along with improved irrigation flow measurement, as explained more thoroughly below.

Description of the Amount of Estimated Water Savings

The estimated amount of water expected to be conserved is 3,400 acre-feet per year as a direct result of this project, measured in terms of additional storage supplies for Harlan County Reservoir, as outlined in more detail below.

Description of Current Losses

Out of the 3,400 acre-feet per year of expected conserved water, about 350 acre-feet per year is currently going toward river carriage losses from Harlan County Dam to the Superior-Courtland Diversion Dam, about 1,850 acre-feet per year is going toward Superior Canal losses in the reach from the diversion dam to the proposed new South of Superior connection, about 350 acre-feet per year is going toward Superior Canal losses in the reach downstream of the new South of Superior connection, and about 850 acre-feet per year is spilled at the end of the ditch at the terminal wasteway. For the river and canal losses, a portion of these losses is currently going toward phreatophyte evapotranspiration, direct water surface evaporation, and ground seepage. A portion of canal seepage is likely currently returning back to the stream, but the timing and amount of this component is currently unknown. Assumptions used in the Republican River Compact Administration (RRCA) Accounting Procedures, used by the three states of Nebraska, Kansas, and Colorado to track water use, water allocations, and Compact Compliance in the Republican River basin, include estimates as to the amount of canal losses returning to the river. Since any canal seepage returns would be occurring downstream from the diversion dam, they are not currently available for diversion by either NBID, or for Kansas irrigators in the KBID service area.

Description of the Support/Documentation of Estimated Water Savings

Inflow/outflow tests, along with other general water balance methods, were used to estimate water savings resulting from the Project.

Historic diversion, delivery, and spill data obtained from the Bureau's Nebraska-Kansas Area Office were used to calculate canal loss in the Superior Canal, as detailed in Table 1 below and summarized in Table 2. These data are also displayed graphically in Figures 6 to 9 below. The years 2008-2019 were used to derive an average for each of these categories since these years included both wet and dry conditions, and are more representative of current water management agreements and operational policies. Canal loss was calculated using the following simple equation:

Canal Loss = Canal Diversion – Spills – Deliveries.

TABLE 1: Superior Canal Water Data				
	From USBR Monthly Water Distribution Table			
Year	Diversions	Spills	Deliveries	Canal Loss (Div-Spill-Del)
2008	5,666	566	1,060	4,040
2009	6,336	507	2,523	3,306
2010	6,489	1,211	2,769	2,509
2011	7,070	1,265	2,169	3,636
2012	9,744	930	4,194	4,620
2013	6,161	438	2,566	3,157
2014	0	0	0	0
2015	6,571	449	1,864	4,258
2016	6,308	687	1,834	3,787
2017	7,493	316	2,340	4,837
2018	8,121	269	2,352	5,500
2019	7,741	3,325	1,216	3,200
Average	**6,475**	**830**	**2,074**	**3,571**

TABLE 2: 2008-2019 Superior Canal Averages (Rounded to nearest hundred AF)	
Diversions	6,500
Spills	800
Deliveries	2,100
Canal Loss	3,600

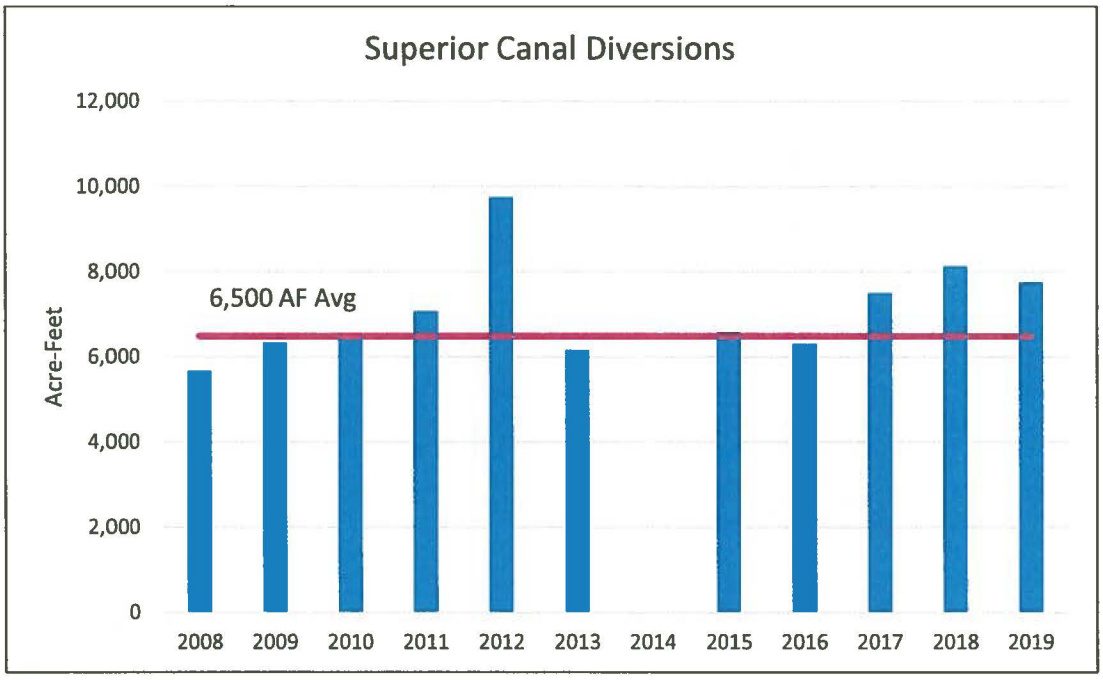

Figure 6: Superior Canal Diversions

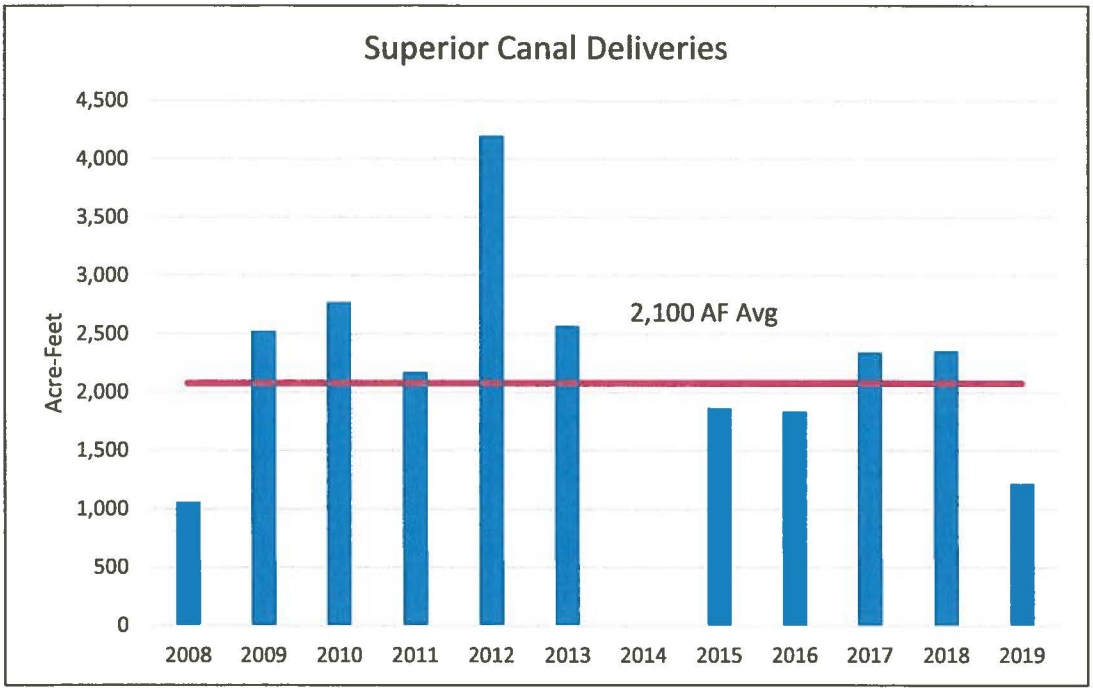

Figure 7: Superior Canal Deliveries

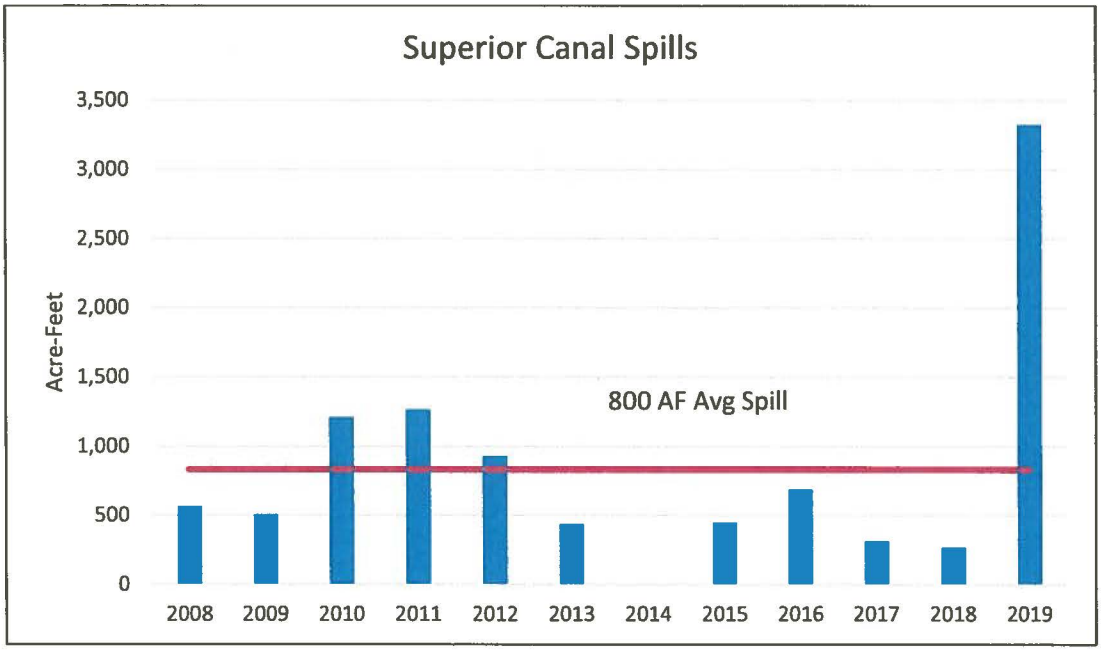

Figure 8: Superior Canal Spills

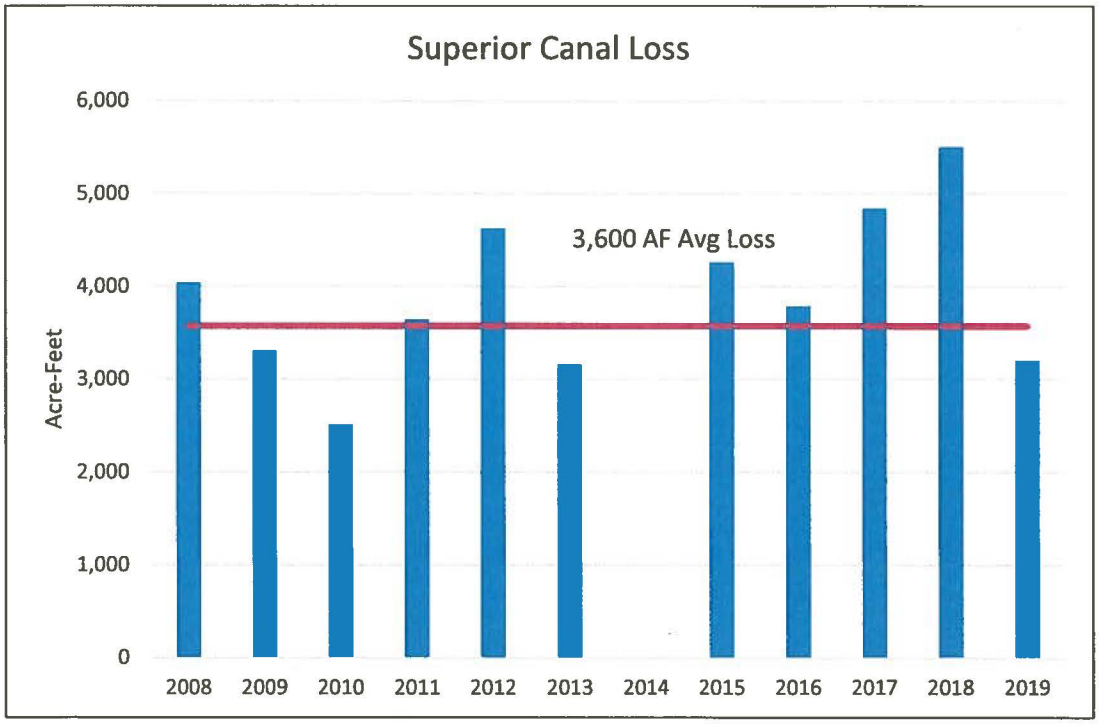

Figure 9: Superior Canal Losses

Another way to consider canal loss is to determine the percent lost per mile as it flows down the canal.

$$Percent\ of\ Canal\ Loss\ per\ mile = \frac{Volumetric\ Rate\ of\ Canal\ Loss}{(Length\ of\ Canal * Inflow)}$$

For this Superior Canal calculation, it was assumed, after consultation with NBID staff, that roughly half of the deliveries for the canal occur just upstream of Lateral 17.5, located just west of the Community of Superior (see Figure 4), and the other half occur at the end of the canal. It was also assumed that the percent loss per mile is the same both upstream of Lateral 17.5 and downstream.

$$\%\ of\ Canal\ Loss\ per\ Mile\ in\ First\ 17.5\ Miles = \%\ of\ Canal\ Loss\ per\ Mile\ in\ Last\ 13.3\ Miles$$

The equation for the upstream section is shown below:

$$Percent\ of\ Canal\ Loss\ per\ mile = \frac{Canal\ Loss\ in\ first\ 17.5\ miles}{(17.5\ miles * Headgate\ Diversion)}$$

The equation for the section of the canal downstream of the Lateral 17.5 is included below:

$$\%\ of\ Canal\ Loss/mile = \frac{Canal\ Loss\ in\ last\ 13.3\ miles}{13.3\ mi.* (Headgate\ Divers - \frac{1}{2}Deliv - Canal\ Loss\ in\ first\ 17.5\ mi.)}$$

We also know that the total Canal Loss is equal to 3,600 AF:

$$3{,}600\ AF = Canal\ Loss\ in\ first\ 17.5\ miles + Canal\ Loss\ in\ last\ 13.3\ miles$$

Solving the last four equations simultaneously for the percent loss per mile in the Superior Canal results in an average over the 2008 to 2019 time period of about 2.39% loss per mile.

For comparison, Volume IV of the United States Department of the Interior's Bureau of Reclamation Manual (released 1/19/1951, superseding 12/30/1947 edition), titled "Water Studies", includes in Section 7.2.3A(3) a table (see Figure 10 below) of rough percent losses per canal mile for different canal capacities and soils. Our calculation of 2.39% agrees well with the values under the medium pervious and pervious soils groups for a canal with 51-75 cfs capacity (a typical diversion rate for the Superior Canal), and with the values under the pervious soils groups for canals with capacities of 76 cfs or more (the Superior Canal capacity is listed as 139 cfs).

Losses are sometimes stated in percent loss per mile of canal length and while this terminology is not strictly applicable to canals varying greatly in length it may be acceptable as a guide, particularly if available data are in these terms. The following values are included for use in rough preliminary studies prior to selection of the canal section:

Capacity of canal or lateral S.F.	Loss in percent of flow per mile		
	Impervious soils-heavy clay loams	Medium pervious clay loam & silt	Pervious soils sandy loam
10 or less	4.0	8.0	12.0
10 - 25	2.5	4.5	7.0
26 - 50	1.5	3.0	4.5
51 - 75	1.0	2.0	3.0
76 or more	0.75	1.5	2.5

Figure 10: Selection from Volume IV of Bureau of Reclamation Manual, as revised 1/19/1951, Section 7.2.3A(3)

Using this assumption for percent loss per mile of canal, and using the assumption that half of the total Superior Canal deliveries occur in the combined South of Superior and East of Superior Areas, a general representation of current conditions is shown in Figure 11. Canal efficiencies calculated as deliveries divided by headgate diversions are currently estimated around 32% (2,100 af deliveries / 6,500 af diversions).

Figure 11: Current Superior Canal Conditions

Now using the same assumptions as above for deliveries and percent loss per mile in the canal, along with the assumption of around 5% loss from the Superior-Courtland Diversion Dam to the Community of Superior (as suggested by staff at the Nebraska-Kansas Area Office in McCook), Figure 12 below shows what the new system could look like under the proposed Project, with both the South of Superior and East of Superior areas utilizing new river diversions to meet their irrigation demands, and no

water flowing in the siphon passing under the community of Superior. This scenario also assumes that the improved efficiencies and operational responsiveness in the East of Superior Area results in no spills at the terminal wasteway located at the distal end of the main canal. This representation has also been simplified in that both the Project's new South of Superior and East of Superior diversions are represented in the diagram as a single diversion point.

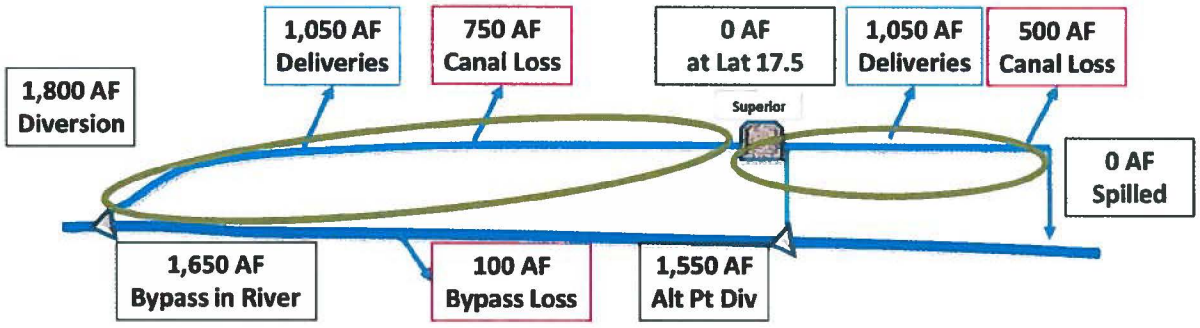

Figure 12: Superior Canal Conditions With Project

As shown, the total diversions are drastically reduced because of the significant reductions in canal losses and spills. Canal efficiencies under the Project would increase to about 63% (2,100 af deliveries / 3,350 af diversions). Figure 13 below shows the differences in flow at each labelled area, with positive numbers denoting increased values and negative numbers denoting decreased values with the implementation of the Project).

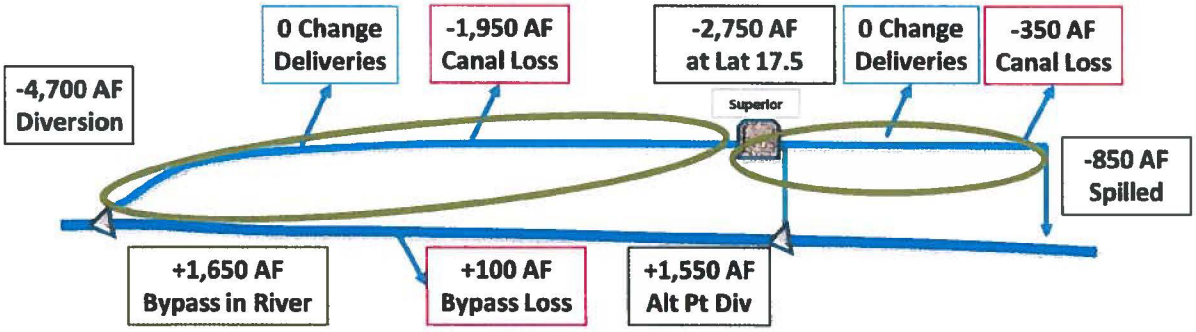

Figure 13: Estimated Changes to Superior Canal Flow Conditions Resulting from Project

As indicated above, the total flow needed above the Superior-Courtland Diversion Dam with the Project is 3,050 AF per year less on average, since while the Superior Canal diversion decreases by 4,700 AF per year, an additional 1,650 AF per year must be passed over the diversion dam within the Republican River for downstream diversion at the new river diversion galleries (-4,700 + 1,650 = -3,050 AF per year).

Staff at the Bureau's McCook Area Office assume a 10% river loss in certain calculations for determining transit losses between Harlan County Dam and the Superior-Courtland Diversion Dam. Using that assumption, an average of 3,400 AF per year of less Harlan County Reservoir releases would be needed due to the 3,050 AF per year in reduced diversion demands at the Superior Canal headgate. As a result, the Project is estimated to result in an average increase in Harlan County Reservoir storage of 3,400 AF per year, as summarized in Figure 14 below.

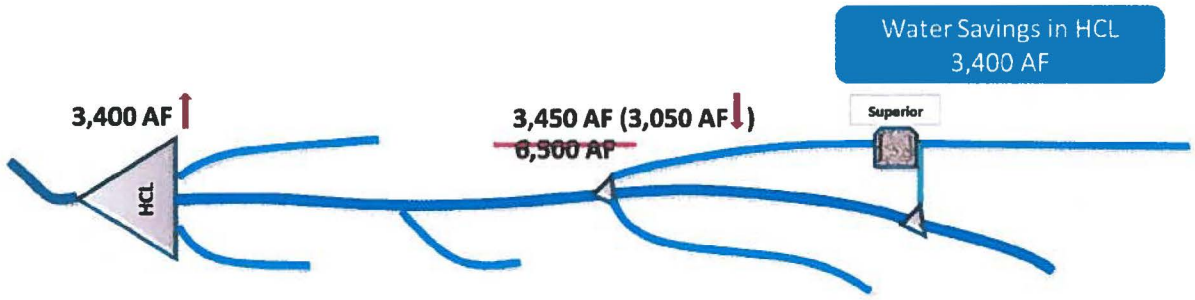

Figure 14: Harlan County Reservoir Storage Improvements from Project

Canal Lining/Piping

The following information is specific to the new piping that will be included for both the South of Superior and East of Superior Areas.

a. Estimated average annual water savings are 3,400 acre-feet per year, as measured at Harlan County Reservoir. Calculations, assumptions, and supporting data are included in the "Description of the Support/Documentation of Estimated Water Savings" section above.
b. Average annual canal seepage losses have been determined using inflow/outflow tests and other water balance methods, as described in the "Description of the Support/Documentation of Estimated Water Savings" section above.

c. Expected post-project seepage/leakage losses are 1,250 acre-feet per year, as shown in the "Description of the Support/Documentation of Estimated Water Savings" section above.
d. Anticipated annual transit loss reductions are 74 acre-feet per mile for the entire Superior Canal, and 111 acre-feet per mile for the portion of the Superior Canal from the headgate to Superior Canal's Station 1205+42, which marks the western edge of this particular project.
e. Actual canal loss seepage reductions will be verified by using future NBID diversion and delivery data, spill records from the Superior Canal's terminal wasteway, along with the metered diversion data from the two new river diversions. Inflow/outflow calculations similar to those described above can be compared with pre-project conditions to determine and verify canal loss seepage reductions. Since the addition of the new diversions provides supplemental/alternative diversions, instead of outright replacing the existing diversion structure, it should be easy to determine the effectiveness of the Project in reducing canal losses by directly measuring flow conditions with and without the new diversions in operation.
f. The South of Superior diversion will use a 16-inch diameter, PVC C905 pipe, measuring approximately 700 linear feet from the two gallery wells to the connection with the buried Lateral 17.5 pipeline. The East of Superior diversion will use a 32-inch diameter, PVC C905 pipe, measuring approximately 7,100 linear feet from the six gallery wells to the connection with the main canal near the Lateral 21.9 turnout at Station 1205+42 of the main canal.

Irrigation Flow Measurement

While irrigation flow measurement is a secondary component of the Project, the new measurement devices for both the South of Superior and East of Superior diversions will be located much closer to the farm delivery turnouts than the canal headgates, which should improve overall efficiency and water management responsiveness, and reduce spills to the river. No estimate of a quantified water savings from this improved measurement has been included here, but it should be expected that some level of additional efficiency improvement will follow as a result of these new measurement devices.

Smart Irrigation Controllers

Another secondary component of the Project includes the use of smart technology with the respect to the SCADA connection with the Rubicon server and Rubicon Water Network Control system. As with irrigation flow measurement, the water savings associated with the use of this smart technology has not been included as part of this Project application, but an additional level of efficiency would be expected as a result of this secondary component. Near instantaneous control of the pump operation would likely result in reduced spills, and better overall delivery to the lower section of the Superior Canal.

E.1.2. Evaluation Criterion B—Water Supply Reliability (18 points)

The Superior Canal Delivery Efficiency Improvement Project is specifically designed to make water available for multiple beneficial uses, including agricultural, environmental, and recreational interests. Conserved water will also help prevent water related conflicts in the region, which have occurred multiple times in the form of interstate water litigation before the U.S. Supreme Court, several arbitration proceedings between the three states, and numerous lawsuits and disagreements between local and State water management entities (including several that are currently partnering under this Project) and private interests. It also will explicitly comply with the provisions of P.L. 111-11, Section 9504(a)(3)(B), since none of the associated water savings will be used to increase the total irrigated acreage of NBID, and no increase in consumptive use of water in the operation of NBID will result from the Project – in conformance to the Republican River Compact, Nebraska State laws and regulations, the current Integrated Management Plan for the Lower Republican NRD, and the Republican River Basin-Wide Plan.

1. **Specific Water Reliability Concern Addressed**
   The specific water reliability concerns addressed by the Project include shortages due to periodic drought, and water management limitations due to the distance between Harlan County Reservoir and the irrigated lands serviced by the Superior Canal, as well as the distance between the Superior Canal headgate and the Project area.

- Drought is a regular occurrence within the Republican River basin. Extreme droughts were recently experienced in the early to mid-2000s, and again from around 2012 to 2015. These droughts affect the water supplies in the basin in

several different ways, including direct stress to irrigated cropland, and impacts to storage reservoirs. NBID relies on two primary sources for its surface water supply: natural flows derived from streamflow naturally generated within the basin from earlier rain and snowfall, and storage releases from Harlan County Reservoir. Droughts tend to limit the amount of inflow into Harlan County Reservoir and inflows into the river below the reservoir, which reduces all supplies available to both NBID and KBID irrigators. Water stored within the reservoir is split between NBID and KBID according to a formula outlined in a Memorandum of Agreement (MOA) between the two districts (as amended), which works in coordination with RRCA Accounting Procedures governed by the Compact and a Final Settlement Stipulation (FSS), signed by the three states in 2002; and subsequent RRCA Resolutions. In addition, the long distances between Harlan County Reservoir and the Superior Canal river headgate diversion, as well as between the headgate and the downstream end of the canal, create challenges in ensuring that timely, adequate releases from the upstream dam are made, and in fully utilizing natural flows that may be available.

- The Project will address the water reliability concern by reducing losses in the overall water delivery system, improving storage supplies in Harlan County Lake, and increasing water management options via alternative points of diversion. The Project will reduce the distance between the point of diversion from the Republican River to the points of field delivery through the installation of two new gallery well diversions near the Community of Superior. The conserved water that results from the Project will be available in Harlan County Reservoir, and could be stored to meet future drought needs for both NBID and KBID, benefiting recreation and environmental purposes in the reservoir simultaneously.
- The mechanisms that will be used to put the conserved water to the intended use are the existing outlet structures at Harlan County Dam, existing NBID and KBID diversion structures (including the existing Superior-Courtland Diversion Dam and associated headgates for Superior and Courtland Canals) and the new diversions and pipeline connections to the Superior Canal that are part of this Project.
- The full quantity of conserved water, estimated at 3,400 acre-feet per year at Harlan County Reservoir, will be available for the intended purposes described above.

2. **Making Water Available to Achieve Multiple Benefits to Multiple Water Users**

The Project will make water available to achieve multiple benefits and to benefit multiple water users.

- The Project will benefit agricultural, environmental, and recreational sectors and users.
    - There are no federally threatened or endangered species, federally recognized candidate species, or state listed species in the Project area. However, as mentioned above, the Project should result in increased supplies in Harlan County Reservoir, which is one of the largest open water bodies along that portion of the Central Flyway – a key bird migration route that extends from Canada south to the U.S. Great Plains and beyond to the south. Hundreds of species of resident and migratory birds have been documented in the ecosystem that includes Harlan County, and the reservoir is known for providing a rest area for thousands of white pelicans and Franklin's gulls. Beyond birds, the region is home to many species of mammals, along with a wide variety of fish, reptiles and amphibians. Higher reservoir levels expected from the Project should increase the habitat area for all of these species, improving overall conditions across all categories of impacted species.
    - The Project will have direct, tangible, and significant benefits to larger initiatives to address water supply reliability via the Republican River Compact, the Lower Republican NRD IMP, the Basin-Wide Plan, and recent RRCA Resolutions affecting Harlan County Reservoir operations and other Compact issues. As described earlier, the enhanced supplies within Harlan County Reservoir have direct positive impacts on all of these initiatives.
- There are no Indian tribes located in the Project area.
- The Project will benefit several rural communities within the area, including the communities of Superior and Hardy. Because of the positive impacts to Harlan County Reservoirs, these benefits should extend far both upstream and downstream, across the entire expanse of the Bostwick Division, from Orleans, Nebraska to Concordia, Kansas.
- As described above, these multiple benefits will be achieved as a result of the increased water supply resulting in Harlan County Reservoir, benefiting agricultural, recreational, and environmental users and uses.

3. **Promoting and Encouraging Collaboration Among Parties to Increase Reliability**

   The project will promote and encourage collaboration among a number of local, State, and federal parties in a way that helps increase the reliability of the water supply.

- There is widespread support for the project, including from the Nebraska Department of Natural Resources, the Lower Republican Natural Resources District, Frenchman Cambridge Irrigation District upstream, and of course the sponsoring district (NBID). This support is documented in the attached letters of support and the NBID Board Resolution.
- The significance of the collaboration and support is evident in the level of support provided by the Lower Republican NRD and NeDNR, as well as the direct and generous support and guidance provided by the Nebraska-Kansas Area Office of the Bureau of Reclamation – which is a testament to how far this collaborative approach has expanded across the Basin in recent years. Only a few years ago, many of these same entities were involved in a number of lawsuits over water management and allocation of water supplies in the Basin, with the resources of the area sometimes viewed under a zero-sum game perspective. Since then, these groups have embraced a collaborative mindset where all parties "get better together". This Project is a case study in how far a collaborative approach can improve conditions for multi-objective resource scenarios such as the one present in this portion of the Basin.
- The possibility of future water conservation improvements by other water users is enhanced by the completion of this project in a number of ways, both local and regional. From a local perspective, there will be more efficient delivery of water to the end users within NBID's lower section of the Superior Canal, along with better measurement of water diversions in this area. As described in other portions of this document, conversations with the Nebraska NRCS representatives has indicated the potential for expanding current on-field conservation practices for those areas benefiting from the Project. From a more regional perspective, the increased supplies in Harlan County Reservoir should benefit users across both the NBID and KBID service areas – not just those within the Superior Canal delivery area. NBID has continued to invest in water efficiency projects, including automation of canal headgates and check structures (including several with WaterSMART connections). KBID has also implemented a large number of water conservation projects in the recent past – some utilizing

WaterSMART grants – to bury laterals and improve canal efficiencies. All of these efforts, conducted by both states, should benefit from improved supply conditions in the upstream Harlan County Reservoir.

- The Project should help prevent water-related crises and conflicts by improving overall storage in Harlan County Lake. As mentioned earlier, this portion of the Basin has experienced several severe droughts in the recent past, along with a number of intrastate and interstate lawsuits concerning the water supplies of the region. Because the Project will increase water supplies in Harlan County Reservoir, several positive impacts should result. Available water supplies for both NBID and KBID should increase, water management conditions for the Bureau should improve – in part via reduced probabilities for Water-Short Year determinations which are largely based on Harlan County Reservoir supplies and projected conditions – and Nebraska State water management should benefit due to the reduced incidents of Compact Call Years that would result from improved Harlan County supplies. The long history of tension and litigation over water in the basin has been well documented, and is well known to water users and water managers throughout the Basin.
- The Lower Republican NRD will have a supporting role with the construction of the well galleries associated with the two new diversions. Depending on the exact location of the gallery wells, which will be precisely determined later in the Project schedule, the NRD will have a role in the permitting of wells pumping from groundwater sources. NeDNR will also assist in the development of any administrative or appropriation-related support for surface water diversions resulting from the Project. Letters of support from both these entities are included with this application, and indicate the strong collaborative mentality pervasive across the various participants.

4. Additional Ways Project Will Address Water Supply Reliability

The Bostwick Division does not exist in a vacuum with respect to the Republican River Basin, or the larger region as a whole. Improved water supply conditions in Harlan County Reservoir should have positive impacts that will expand upstream in the Basin, since these greater supplies may relieve pressure on upstream water users who also are subject to Compact responsibilities and the Nebraska management efforts that are part of the individual NRD IMPs (and associated Compact Call Year provisions), and the Basin-Wide Plan for the Republican River Basin. As a result, upstream Nebraska entities such as the Frenchman-Cambridge Irrigation District (FCID), Frenchman Valley Irrigation District (FVID),

and Hitchcock & Red Willow Irrigation District (H&RW) could also expect improvements in water supply reliability resulting from the project. At the same time, all elements of this Project are fully consistent with existing RRCA Resolutions, the Final Settlement Stipulation (FSS), and the Republican River Compact, and all Project elements will be operated to ensure compliance with the allocation limits established by the Compact. These constraints and guidelines are in place to ensure that the downstream interests within the State of Kansas are also protected.

E.1.3. Evaluation Criterion C—Implementing Hydropower (18 points)

This Project does not include the construction or installation of any additional hydropower capacity. However, just as the Bostwick Division is not disconnected from the larger Republican River Basin, there are connections to adjacent water basins as well. The RRCA Accounting Procedures, utilized by the states to measure water use, water allocations, and other quantitative aspects of water management in the basin, also uses the results of a groundwater model, which estimates the impacts of groundwater recharge in the Platte River Basin on Republican River baseflows. This underground movement of water from the Platte to the Republican River Basin has occurred naturally prior to human influence, but has been magnified by the construction and development of surface water systems in the Platte Basin which create seepage supplies that migrate into the Republican River Basin. In addition, the N-CORPE water augmentation project, located south of North Platte, Nebraska, is used at times by the State of Nebraska for Compact compliance purposes to pump groundwater into Medicine Creek, which then moves downstream in the Basin. A portion of this pumped groundwater would otherwise remain within the Platte River Basin. The Superior Canal Delivery Efficiency Improvement Project outlined in this document could reduce the need for water supplied from outside of the Republican River Basin (referred to as Imported Water Supply in the RRCA Accounting Procedures). This could result in minor, but real, improvement of water supplies within the Platte River Basin. The Platte River Basin is home to a number of hydropower generation facilities, including the Kingsley Hydro Plant at Lake McConaughy on the North Platte River, the North Platte Hydro Facility near North Platte operated by the Nebraska Public Power District (NPPD), several plants owned by the Central Nebraska Public Power and Irrigation District (CNPPID), and Kearney Hydro (owned by NPPD) near the community of

Kearney. As a result, the implementation of the Project could improve hydropower generation conditions within the Platte River System.

E.1.4. Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)

Through dialogue with the NRCS State Conservationist, the Assistant State Conservationist/Programs, and State Irrigation Engineer for Nebraska, it was determined that there are already a number of ongoing NRCS on-farm irrigation practices being implemented within the Project area via the Environmental Quality Incentives Program (EQIP). These ongoing efforts could have direct benefits to the water conservation improvements that would result from the Project. In addition, NRCS staff expressed an interest in expanding similar EQIP practices within the Project in the future – something that could also be facilitated through the Project's conservation supply benefits.

- **Description of Planned and Ongoing Projects**
  The following tables provided by NRCS outline the planned and ongoing EQIP projects by farmers/ranchers that receive water from NBID within the Project area to improve on-farm efficiencies.

Table 3: 2008 Farm Bill EQIP Projects (9 Contracts)		
449	Irrigation Water Management	820.5 Acres
442	Sprinkler Irrigation	316.1 Acres (4)
430	Irrigation Pipeline	5,805 Feet
533	Pumping Plant	4 Each
328	Conservation Crop Rotation – Irrigation to Dryland	108.7 Acres

Table 4: 2014 Farm Bill EQIP Projects (3 Contracts)		
449	Irrigation Water Management	199.8 Acres
441	Micro-Irrigation	135.9 Acres (2)
442	Sprinkler Irrigation	63.9 Acres (1)
430	Irrigation Pipeline	5,155 feet
533	Pumping Plant	2 Each
587	Water Conservation Structure	1 Each
328	Conservation Crop Rotation – Irrigation to Dryland	10.7 Acres

- The tables above indicate the NRCS EQIP Irrigation Water Management practices in place within the Project area, along with the quantity of each practice (acres, feet, or number of features), and in some cases also the number of contracts (in parentheses).
- As shown in the tables above, the farmers within the Project area have requested technical and financial assistance from NRCS for the on-farm efficiency projects outlined by practice type.
- The values in the tables above were sent directly from the NRCS Assistant State Conservationist/Programs for Nebraska. As shown, the number of acres within Practice 449 – Irrigation Water Management represent a significant percentage of the South of Superior and East of Superior Areas (roughly 540 acres and 3,500 acres, respectively). It would be difficult to tabulate a precise percentage, since simply summing the acreage values across the different practices could result in double-counting, as some tracts could be using multiple practice types.
- While letters of intent from individual farmers and ranchers within the affected project areas were not available, the feedback and information provided directly from NRCS staff should provide adequate assurances of the validity of these quantitative estimates of on-farm practices.

- **Description of How Proposed WaterSMART Project Would Complement Ongoing or Planned On-Farm Improvements**
  The proposed WaterSMART Project would complement ongoing and planned on-farm improvements by providing improved water supply reliability, enhanced water measurement, and more time-critical responses to changing water demands within the Project area.
    - The proposed WaterSMART project would directly facilitate the on-farm improvements under EQIP. The installed well gallery diversions and connected pipelines should provide direct benefits to each of the practices outlined in the tables above. For example, the Irrigation Water Management practices would benefit from improved water supply reliability, water measurement, and time-critical responses to changing water demands within the individual tracts. Sprinkler irrigation and micro-irrigation practices would benefit from these same Project components, in part by being better able to respond quickly to changing irrigation demands with adjusted irrigation delivery rates.
    - The proposed WaterSMART project will <u>also</u> complement the on-farm project by maximizing efficiency in the area. As described earlier, the two new diversions will eliminate wastes and losses currently present in the Superior Canal system, and the SCADA-enabled wells that make up the diversion system with their associated water measuring devices will also improve water delivery efficiencies within the Project area.

- **Description of the On-Farm Water Conservation or Water Use Efficiency Benefits That are Expected to Result from Any On-Farm Work**
    - While conversations with NRCS staff suggest that real benefits to the NRCS on-farm practices could result from the proposed WaterSMART Project, staff also expressed the fact that estimating water savings associated with EQIP projects is a difficult task that has been subject of debate for many years. While a universal method of measuring EQIP water savings has not yet been agreed to, the award of a WaterSMART grant in the Project area would provide an excellent opportunity to coordinate the efforts of NRCS, Bureau, and NBID staff in developing better quantification techniques for evaluating the water savings associated with ongoing and newly established EQIP projects.

- The proposed WaterSMART project will also complement the on-farm project by maximizing efficiency in the area. As described earlier, the two new diversions will eliminate wastes and losses currently present in the Superior Canal system, and the SCADA-enabled wells that make up the diversion system with their associated water measuring devices will also improve water delivery efficiencies within the Project area.

- **Map of Water Service Area Boundaries**
  A map of the water service area boundaries within the Project area can be found in Figure 1. A map similar to this was provided to NRCS staff to help facilitate the discussions that resulted in the information provided in the text and tables above.

E.1.5. Evaluation Criterion E—Department of the Interior and Bureau of Reclamation Priorities (10 points)

Department Priorities

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt

a. **Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;**
As mentioned earlier, the Project will provide water conservation benefits that should partner well with existing and future NRCS on-farm Best Management Practices (BMPs). The selection of these practices has been, and will continue to be, based on scientific information concerning soil properties, drainage conditions, and other land and water-focused properties.

b. **Examine land use planning processes and land use designations that govern public use and access;**
While the Project area itself within the boundary of the NBID service area for Superior Canal does not directly relate to areas with potential public access, the benefits to Harlan County Reservoir that would result from the Project's water conservation would have positive impacts to the existing public use and access features of the lake.

c. **Revise and streamline the environmental and regulatory review process while maintaining environmental standards;**
It is the intent of the applicant to work with Bureau regulatory staff to pursue a Categorical Exclusion (CE) to NEPA for this project, as the components of the Project appear to fall within the established categories of activities that generally do not have significant impacts on the environment. This streamlined permitting process should help move implementation forward while ensuring proper environmental objectives are met and followed. Should the Bureau's investigations determine that a more extensive Environmental Assessment is required, it appears likely that the Project would lend itself well to a Finding of No Significant Impact (FONSI).

d. **Review Department water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;**
The Project specifically involves the identification of ways to improve and better utilize existing water storage and water distribution systems, including Harlan County Reservoir and Dam, and the Superior Canal. New diversions have been identified for the Superior Canal to improve this system, which should provide for better utilization of Harlan County Reservoir storage capacity via the water conservation gained by the Project. All of these benefits should help to resolve and prevent conflicts such as the ones that have occurred in the past between the three states and local water users and administrators.

e. **Foster relationships with conservation organizations advocating for balanced stewardship and use of public lands;**
Enhanced storage levels in Harlan County Reservoir should provide better conditions for a variety of fish, birds, mammals, reptiles, amphibians, insects, and other species that spend time in and around the reservoir. The Bureau and NBID have a long history of working to promote balanced stewardship and use of public lands, and the Project benefits should make that cooperative relationship stronger within the Basin.

f. **Identify and implement initiatives to expand access to Department lands for hunting and fishing;**
Improved storage conditions in Harlan County Reservoir should have direct benefits for hunting and fishing within Department lands in the reservoir vicinity.

g. **Shift the balance towards providing greater public access to public lands over restrictions to access.**
See item f. above.

2. *Utilizing our natural resources*

a. **Ensure American Energy is available to meet our security and economic needs;**
As mentioned earlier, the Project may result in indirect improvements to hydropower generation in areas adjacent to the Republican River Basin.

b. **Ensure access to mineral resources, especially the critical and rare earth minerals needed for scientific, technological, or military applications;**
The Project should not impact access to mineral resources within the region.

c. **Refocus timber programs to embrace the entire 'healthy forests' lifecycle;**
The Project should not have any direct impact on timber resources.

d. **Manage competition for grazing resources.**
The Project should not have any direct impact on grazing resources.

3. *Restoring trust with local communities*

a. **Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;**
While recreational benefits are not the focus of this Project, the higher storage content expected to result in Harlan County Reservoir should provide benefits to those who boat, fish, and recreate on the lake. Multiobjective reservoirs such as Harlan County are sometimes subject to tensions between recreational and agricultural interests when downstream irrigation needs require reservoir drawdown. This project should help to

improve relationships with those important neighbors by reducing the extent and regularity of those drawdowns, which should also provide regional economic benefits as a result.

b. **Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities;**

This Project builds on the steadily improving line of communication that has become established between NBID, the state NeDNR, the Bureau, and the local Lower Republican NRD, which is a byproduct of multiple initiatives to foster collaboration within the Basin. In the past, partnerships between NeDNR and irrigation districts in the Basin were largely limited to occasional purchases by NeDNR of surface water supplies owned by the districts to partially address acute water shortages, sometimes well after State Compact compliance challenges had become pronounced. This project, in contrast, is an example of how the State is now working in a proactive fashion with the irrigation district, with consultation and assistance from the Bureau and the NRD, to create win-win conditions with less temporary management tools that are better able to react to water shortages before they become acute. Communication has been the cornerstone of this new relationship, and this project builds on that new paradigm.

4. ***Striking a Regulatory Balance***

a. **Reduce the administrative and regulatory burden imposed on U.S. industry and the public;**

As mentioned earlier, this project will hopefully be able to utilize a Categorical Exclusion (CE) to NEPA for this project, as the components of the Project appear to fall within the established categories of activities that generally do not have significant impacts on the environment.

b. **Ensure that Endangered Species Act decisions are based on strong science and thorough analysis.**

There are no known endangered species within the area affected by the Project.

5. *Modernizing our infrastructure*

   e. **Support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;**
   NBID has an established track record of using private contractors to assist with its management and infrastructure needs. This project, which will enhance the diversion capabilities of the Superior Canal, will involve selecting reliable, cost-effective private contractors to complete the construction and modernization components.

   f. **Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;**
   This project would represent a major addition to Superior Canal infrastructure – one of the most significant changes since the canal was constructed in the late 40s and early 50s. The participation of private contractors, working in conjunction with NBID and the Bureau, will be a part of a larger, phased effort to improve multiple aspects of the Superior Canal system.

   g. **Prioritize Department infrastructure needs to highlight;**
      1. **Construction of infrastructure;**
      2. **Cyclical maintenance;**
      3. **Deferred maintenance.**

   As mentioned above, this Project represents a major upgrade to the Superior Canal, which has remained largely unchanged over the past 70 years.

Reclamation Priorities

1. *Increase Water Supplies, Storage, and Reliability under WIIN and other Authorities*
   The 2016 Water Infrastructure Improvements for the Nation (WIIN) Act (S. 612) included both the Water Resources Development Act of 2016 and the Water and Waste Act of 2016, along with several other provisions to improve and manage the infrastructure of the United States. The Project directly supports this Reclamation priority, creating additional water supplies through improvements in water efficiency, enhancing storage in the upstream Harlan County Reservoir,

and improving water reliability for both NBID and KBID. This improved reliability is the result of greater average storage supplies in Harlan County Reservoir, new canal diversions that are located closer to the farm delivery turnouts, and improved operational capability from the new well galleries via the new SCADA connections and water measurement devices.

2. ***Streamline Regulatory Processes and Remove Unnecessary Burdens to Provide More Water and Power Supply Reliability***
   As mentioned earlier, this project will hopefully be able to utilize a Categorical Exclusion (CE) to NEPA for this project, as the components of the Project appear to fall within the established categories of activities that generally do not have significant impacts on the environment.

3. ***Leverage Science and Technology to Improve Water Supply Reliability to Communities***
   The Project components include new variable drive, high-efficiency electric motors for the gallery wells, state of the art SCADA connections for remote operations, and highly accurate measuring devices for ensuring accurate recording and monitoring of diversion flow rates. Each of these key components will help achieve greater water supply reliability for NBID, and produce direct benefits to the neighboring communities.

4. ***Address Ongoing Drought***
   By reducing inefficiencies in the Superior Canal system, and enhancing water management and operations capabilities for NBID, this Project should provide important conservation savings to buffer against the impacts of future droughts. Storage content in Harlan County Reservoir is a key indicator of how well the water resources infrastructure for the Bostwick Division can respond to drought conditions, and this Project directly improves that very storage content.

5. ***Improve the Value of Hydropower to Reclamation Power Customers***
   Hydropower is not a part of the Bureau's water portfolio in this portion of the Republican River Basin.

6. ***Improve Water Supplies for Tribal and Rural Communities***
   The Project areas (both South of Superior and East of Superior) are in heavily rural communities, as is the area in the vicinity of Harlan County Reservoir.

These communities will receive direct benefits from the improved water supplies that result from the Project.

7. ***Implementation of new Title Transfer authority pursuant to P.L. 116-9***
   Title transfer is not a component of this project. This project does, however, add to the portfolio of infrastructure owned and operated by NBID within the Project area.

E.1.6. Evaluation Criterion F—Implementation and Results (6 points)

E.1.6.1. Subcriterion F.1— Project Planning

NBID has both a Water Conservation Plan and a System Optimization Review (SOR) in place. There are several additional regional planning efforts in place that also have elements that could provide support for the proposed project.

1. ***District Operating Plan***
   NBID signed a new repayment contract with the United States effective January 1, 2001 (Contract No. 009D6B0121). The contract included a "District Operating Plan" (Attachment B to the contract) between the U.S. Department of Interior and NBID, developed to guide NBID's water operations and the implementation of certain water conservation and environmental activities established in the process of securing a 40-year repayment term. Through this District Operating Plan, NBID agreed to initiate water conservation measures to improve the efficiency of the project delivery system and encourage on-farm efficiency improvements. The Plan listed a goal to increase the delivery efficiency of the District by a total of 8 percent and on-farm efficiencies by a total of 5 percent. Some excerpts from the primary water conservation and environmental measures outlined in the District Operating Plan are summarized below, along with information as to how those measures could provide support for the proposed project:

Water Conservation Measures

a. Establish a revolving water conservation fund to be utilized for annual costs associated with the water conservation program activities
   A revolving water conservation fund could provide support for several of the NRCS EQIP projects in place now and/or the future, as outlined with Evaluation Criterion D.
b. Continue, when permitted, the practice of seasoning canals with stream flows or flood waters to reduce canal losses and control the growth of vegetation
   The new diversions could be used to divert stream flows or flood waters for canal seasoning purposes.
c. Continue the established practice of providing assistance to irrigators who upgrade on-farm irrigation facilities by improving turnout locations, installing meters, assisting with buried pipe projects to allow the use of gated pipe or center pivots, and implementation of other new technology
   These practices and on-farm upgrades also match well with the NRCS EQIP projects outlined in the written response for Evaluation Criterion D.
d. Continue to work with Reclamation on evaluating computer software and other new technology that shall improve water scheduling and accounting
   Because of the proposed integration with Rubicon's network system and software, this water conservation measure directly supports this element of the Project.
e. The District also agrees to continue and/or improve its existing policies and practices that further the goals of water conservation; provide educational opportunities for District employees, such as canal operations training, water scheduling, water use seminars, etc,; and provide information to educate irrigators on District operations, irrigation practices, and new technologies and available assistance programs
   The new infrastructure and technology incorporated as elements within the Project could greatly benefit from improved skills and capabilities developed by NBID employees through the training and methods described in this conservation measure.

Environmental Measures

a. Establish policies to preserve lake levels
   Preserving lake levels in Harlan County Reservoir is one of the primary objectives of the proposed project.

As indicated in these sections of the District Operating Plan, and other portions of the Plan, the proposed Project would be directly supported by many of the elements of the Plan. The Project involves converting portions of NBID's delivery system to incorporate buried pipes, improved water measurement, and technologies such as remote SCADA networks.

2. ***Lower Republican Integrated Management Plan***

   The Lower Republican Integrated Management Plan (IMP) includes several goals and objectives which could be implemented in part through the initiation of the proposed project, as described further below.

   a. ***Goal #1 – Ensure that ground water and surface water users within the LRNRD assume their share of the responsibility to keep Nebraska in compliance with the Republican River Compact.***
      The Project would help NBID take a more active role in ensuring Compact compliance, by better utilizing its water supplies, reducing wastes and losses, and improving the overall efficiency of the Superior Canal system.

   b. ***Objective #6(d) - The LRNRD and the DNR will continue to investigate and explore augmentation projects that would add to or retime the water supply within the basin. Such augmentation and retiming projects include, but are not necessarily limited to, the following: d. Conjunctive management of surface water irrigation projects***
      The proposed Project is an excellent example of a conjunctive management effort with an existing surface water irrigation project, designed to add to and retime the water supply within the Basin. Providing improved supplies in Harlan County Reservoir is expected as a direct result of the Project.

3. ***Republican River Basin-Wide Plan***

   The recently approved (2019) Republican River Basin-Wide Plan includes a number of goals and objectives which could support the proposed Project, as described below.

a. ***Goal #1 – Maintain Nebraska's compliance with the Republican River Compact and applicable state laws***

   By improving the efficiency of the Superior Canal system, and providing more reliable storage supplies in Harlan County Reservoir, the Project will make it easier for the State of Nebraska to stay within its Compact designated allocations. The Project would also work well with the provisions of recent RRCA Resolutions which encourage practical solutions for improving water supply reliability for water users in all three states, including downstream water users in Kansas.

b. ***Goal #2 – Maximize Nebraska's efficient and beneficial consumptive use of its portion of the water supply, increase certainty for long-range planning of water supplies to reduce the need for regulatory actions, and increase collaborative efforts among water management entities and stakeholders across the Basin***

   Goal #2 seems to almost be written with this particular project in mind. The Project is designed to specifically take advantage of the collaborative efforts between NBID, NeDNR, Lower Republican NRD, and the Bureau, to increase water supply certainty through a pro-active, non-regulatory approach.

c. ***Goal #3 – Positive public relations; including information sharing, within and outside the Basin***

   NBID will continue to work with its water users, the NRD, the State, and the Bureau to enhance public relations, including as part of this collaborative project. Because this project will include multiple beneficiaries, including potential entities outside of the Basin, positive public relations is very likely to result quickly, and in a sustained fashion.

d. ***Goal #4 – When possible, pursue projects that not only benefit water supplies and uses, but also create benefits for fish, wildlife, recreation, and conveyance within the Republican River Basin***

   The improved Harlan County Reservoir storage conditions will provide direct benefits for fish, wildlife, and recreation within the reservoir. And conveyance will greatly benefit from the improved delivery efficiencies that will result for the Superior Canal system.

E.1.6.2. Subcriterion F.2— Performance Measures

The text above describing the methodology for responding to 3.1.1 Evaluation Criterion A (Quantifiable Water Savings) provides the background for how actual benefits will be

quantified upon completion of the project. The performance metrics for the Project will include Superior Canal diversion rates, overall Superior Canal efficiencies (measured as deliveries divided by diversions), canal losses in the portion of the Superior Canal upstream of Lateral 17.5 (the portion of the canal upstream from the Project areas) – both in absolute acre-feet per year values and as a percentage of canal flows, and canal spills. Additional performance metrics may be identified with the addition of flow measurement devices and after the improved operational capabilities resulting from the Project are better understood.

E.1.6.3. Subcriterion F.3— Readiness to Proceed

The estimated construction period is 24 months. Major tasks will include the following steps:

- Conduct environmental and cultural resource assessment (within 3 months of Project award)
- Complete engineering design development (within 7 months of Project award)
- Selection of A/E Contractor through competitive request for proposal process (within 8 months of Project award)
- Selection of Construction Contractor by soliciting competitive signed bids (within 8 months of Project award)
- Kick-off meeting with NBID staff and contractors, verifying schedule and reviewing site issues (within 9 months of Project award)
- Place orders for all necessary equipment (within 10 months of Project award)
- Other mobilization tasks (within 12 months of Project award)
- Commence initial construction and installation efforts (within 14 months of Project award)
- Construction/installation 50% Complete (within 20 months of Project award)
- Complete well drilling and pump installation (within 26 months of Project award)
- Complete pipe trenching, backfilling, and installation for South of Superior Area (within 30 months of Project award)
- Complete pipe trenching, backfilling, and installation for East of Superior Area (within 34 months of Project award)
- Final integration with Rubicon SCADA system and operations network, Construction/installation 100% Complete (within 36 months of Project award)

NBID will work with the Lower Republican NRD and NeDNR to obtain any necessary groundwater permits or surface water appropriations, as determined when final siting of the well galleries is complete. Engineering and design work will focus on the pipeline and well galleries, along with preparing for integration of the diversion systems into the Rubicon SCADA network.

No new policies or administrative actions should be needed to implement the project.

E.1.7. Evaluation Criterion G— Nexus to Reclamation Project Activities (4 Points)

The Project is in the Republican River Basin, which includes Reclamation-owned reservoirs and canals, located within the Bostwick Division. NBID uses storage supplies from Harlan County Reservoir via Reclamation repayment contract no. 009D6B0121. There is a clear nexus to Reclamation activities:

- The proposed project is connected to Reclamation activities in a number of ways, including the following examples:
    - The applicant (NBID) does receive Reclamation project water
    - The project is on Reclamation project lands and directly involves Reclamation facilities – including Superior Canal and Harlan County Reservoir
    - The project is in the Republican River Basin, which includes some of the most active Reclamation activity in the State of Nebraska, and which is home to the Nebraska-Kansas Area Office
    - The proposed work will directly contribute water to the Republican River Basin, adding reliable storage supplies to Harlan County Reservoir
- The project will not affect any tribal interests

E.1.8. Evaluation Criterion H— Additional Non-Federal Funding (4 points)

Matching non-Federal funding has already been committed for the Project by the Nebraska Department of Natural Resources, in amounts up to $2.5 million, as outlined in the Letter of Commitment located at the end of this document. The percentage of non-Federal funding provided is included below:

Non-Federal Funding / Total Project Cost = $2.5 million / $4.5 million = 55.6%

Project Budget

Funding Plan and Letters of Commitment

The Project provides a unique opportunity to address multiple critical water resources needs in the Republican River Basin, improving water supply reliability for irrigated agriculture, improving recreational opportunities in Harlan County Reservoir, and enhancing environmental conditions. The funding sources proposed for the Project match these opportunities well, utilizing secured State funds, with assistance from the WaterSMART federal grant program.

The non-Federal share of project costs will be obtained primarily through the State of Nebraska's Department of Natural Resources. The Letter of Commitment from NeDNR, included at the end of this document, indicates an ability to provide State funding of up to $2.5 million in support of the Project. These funds will be available immediately upon successful award of the WaterSMART grant application. Letters of Support from the Lower Republican NRD and Frenchman Cambridge Irrigation District are also included at the end of this document.

The budget proposal does not include any project costs that have been or may be incurred prior to the award.

Budget Proposal

Table 5.—Total Project Cost

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$ 2,000,000
Costs to be paid by the applicant	$ 7,591
Value of third-party contributions	$ 2,500,000
TOTAL PROJECT COST	**$ 4,507,591**

Table 6.—Budget Proposal Cost Breakdown

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	$/Unit	Quantity		
Salaries and Wages				$ 0
Fringe Benefits				$ 0
Travel				$ 0
Equipment				$ 0
Supplies and Materials				$ 0
Contractual / Construction				
A/E Contractor (Engineering/Permits)				$506,010
Construction Contractor (Construction)				$4,001,581
Third-Party Contributions				$ 0
Other				$ 0
TOTAL DIRECT COSTS				**$4,507,591**
Indirect Costs				
Type of rate	percentage	$base		**$ 0**
TOTAL ESTIMATED PROJECT COSTS				**$4,507,591**

Budget Narrative

This project is 100% contractual, with yet to be determined contractors. It is anticipated that two contractors will be selected for this project: an Architect/Engineer (A/E) contractor and a construction contractor. The A/E contractor will provide engineering design services to determine the final technical requirements for the product and materials acquisitions, assist with bidding and evaluation of bids for the selection of a construction contractor, and ensure that the construction is completed according to plans and specifications. The A/E contractor will also assist with environmental permitting and compliance. The construction contractor will be responsible for product acquisition and installation services for the final design.

It is anticipated that design and construction of the project infrastructure could be accomplished in approximately 24-36 months after grant award.

An independent engineering estimate of probable cost of design and construction is provided in Table 7 below in the Contractual subsection.

Salaries and Wages

Project Manager = Tracy Smith, NBID General Manager

No other NBID personnel will be involved in implementing this project.

Fringe Benefits

Since this project is 100% contractual, no fringe benefit costs associated with NBID staff is expected.

Travel

Since this project is 100% contractual, no travel costs associated with NBID staff is expected.

Equipment

Since this project is 100% contractual, no NBID equipment will be needed.

Materials and Supplies

Since this project is 100% contractual, no NBID materials or supplies will be needed.

Contractual

As stated above, this project is 100% contractual. Selection of contractors will be in accordance with procurement standards found in 2 CFR Part 200. The A/E contractor will be determined by a competitive request for proposal process. The construction contractor will be selected by soliciting competitive sealed bids. The construction contractor will provide all materials, supplies, equipment, and labor. An independent engineering estimate for design and construction is provided below in Table 7, along with a summary of those costs in Table 8.

Table 7: Detailed Design and Construction Costs

ACTIVITY	UNIT	EAST OF SUPERIOR UNIT COST	QUANTITY	COST	UNIT	SOUTH OF SUPERIOR UNIT COST	QUANTITY	COST
Republican River Intake Facilities (Well Field)								
River Intake Site Work	AC	$5,205	1	$5,205	AC	$5,205	1	$5,205
Install Groundwater Wells	EA	$65,000	6	$390,000	EA	$65,000	2	$130,000
Install 2,500 gpm Ground Water Pumps	EA	$50,000	6	$300,000	EA	$50,000	2	$100,000
Electrical Hookup (pole, transformer, hookup)	LS	$60,000	1	$60,000	LS	$40,000	1	$40,000
Construct Well/Equipment House	LS	$50,000	1	$50,000	LS	$35,000	1	$35,000
Flow Measurement	LS	$5,000	1	$5,000	LS	$5,000	1	$5,000
SCADA Controls	LS	$60,000	1	$60,000	LS	$20,000	1	$20,000
Bank Protection - Type B Riprap	TON	$75	1000	$75,000	TON	$75	1000	$75,000
Restoration Seeding	AC	$950	1	$950	AC	$950	1	$950
Erosion Control Blanket	SY	$2	1000	$2,000	SY	$2	1000	$2,000
Subtotal				**$948,154.53**				**$413,155**
Water Transfer Pipeline System - RR to Canal (Pipe)								
Clearing Pipeline Route	AC	$2,601	1.5	$3,902	AC	$2,601	0.5	$1,301
Trenching and Backfilling, Pipe Istallation	LF	$74	7100	$526,018	LF	$30	700	$21,000
32" Diameter PVC C905, Pipe Material Only	LF	$110	7100	$781,000	LF	$32	700	$22,400
Dewatering (25% of pipeline length)	LF	$29	1775	$51,475	LF	$29	175	$5,075
Furnish and Install Fittings and Appert. (15% of pipe cost)	LS	$117,150	1	$117,150	LS	$3,360	1	$3,360
County Road Crossings	EA	$5,000	2	$10,000	EA	$5,000	0	$0
Seeding and Mulching (pipeline route)	AC	$950	16	$15,484	AC	$950	1.61	$1,527
Outlet Site Work	LS	$5,000	1	$5,000	LS	$2,500	1	$2,500
Site Restoration	LS	$1,500	1	$1,500	LS	$1,500	1	$1,500
Subtotal				**$1,511,529.84**				**$58,662**
General Construction Activities								
Mobilization/Demobilization	% Const	1.5%		$36,895	% Const	1.5%		$7,077
General Site Work/Site Prep/Construction Access	% Const	1.0%		$24,597	% Const	1.0%		$4,718
Construction Survey	% Const	1.0%		$24,597	% Const	1.0%		$4,718
Site Security (construction fence, barricades, etc.)	% Const	0.5%		$12,298	% Const	0.5%		$2,359
Site Restoration - General	% Const	0.5%		$12,298	% Const	0.5%		$2,359
Erosion and Sediment Control including SWPPP	% Const	1.0%		$24,597	% Const	1.0%		$4,718
Contractor Permit Compliance	% Const	0.3%		$6,149	% Const	0.0025		$1,180
Subtotal				**$141,431.85**				**$27,129**
Engineering Design and Management	% Const	16%		**$416,179**				**$79,831**
Environmental Clearance and Permits				**$8,000**				**$2,000**
Concept Level Construction Contingency	% Const	25%		**$756,324**				**$145,194**
Total Cost Estimate				**$3,781,619**				**$725,972**
Total Cost Estimate Combined	**$4,507,591**							

Table 8: Independent Engineering Estimate for Design and Construction Costs

ACTIVITY	East of Superior Cost	South of Superior Cost	Total Cost
Republican River Intake Facilities (Well Field)	$948,155	$413,155	$1,361,309
Water Transfer Pipeline System - RR to Canal (Pipe)	$1,511,530	$58,662	$1,570,192
General Construction Activities	$141,432	$27,129	$168,561
Engineering Design and Management	$416,179	$79,831	$496,010
Environmental Clearance and Permits	$8,000	$2,000	$10,000
Concept Level Construction Contingency	$756,323	$145,194	$901,518
Total Cost Estimate	**$3,781,619**	**$725,972**	**$4,507,591**

Third-Party In-Kind Contributions

There are no third-party in-kind contributions for this project.

Environmental and Regulatory Compliance Costs

After consulting with the Natural Resource Specialist at the local Nebraska-Kansas Area Reclamation Office, it appears that the Project may fit within a recognized Categorical Exclusion (CE) to NEPA, which may streamline part of the environmental evaluations. It is expected that most of the incurred costs will be associated with the review of cultural resources. An estimate for the environmental and cultural resources compliance survey and review was approximately $2,000 to $3,000. It is understood that these costs will likely be added as a line item to the budget during development of the financial assistance agreement, and may be withheld from the Federal award amount. Besides these costs, an additional amount was included in the budget to cover local and other permitting requirements as needed, for a total of $10,000 in environmental and regulatory compliance costs.

Other Expenses

No other expenses are expected under this project.

Indirect Costs

No indirect costs are expected under this project.

Environmental and Cultural Resources Compliance

NBID will work to ensure compliance with any applicable NEPA, ESA, NHPA, and other environmental and cultural resource compliance requirements. It appears the Project may fit within a recognized CE with respect to NEPA, but this will be investigated as part of the Project implementation. The following text include responses to the questions outlined in Section H.1 of the FOA.

- *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 footprint of the project is expected to be small, focusing on pipeline burial with eight new gallery wells in total, resulting in minimal impacts on the surrounding environment. Any temporary disturbances will be appropriately addressed and ameliorated.

- *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?*

  No listed species or designated critical habitat are known in the project area. If species such as the bald eagle are found in or around the project area, any relevant laws, such as the Migratory Bird Treaty Act, will be followed during construction.

- *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.*

  After consulting the U.S. Fish and Wildlife Service's Wetlands Mapper, the National Wetlands Inventory does not suggest the presence of any wetlands within the area of construction for the pipeline and well galleries. A simple review using the Nebraska Game and Parks Commission's Conservation and Environmental Review Tool (CERT) also did not give reason for concern. There would, however, likely be a connection to Waters of the United States (WOTUS) with respect to the well galleries near the Republican River bank. During construction, all appropriate permits will be obtained and measures taken to minimize any impacts to WOTUS features, and only temporary disturbances are expected.

- *When was the water delivery system constructed?*

  The Superior Canal was constructed over the period from 1949 to 1953.

- *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.*

The Project will result in modifications to the Superior Canal, but only to the extent of linkages with the main canal (East of Superior Area) or a canal lateral (South of Superior Area). As mentioned, the Superior Canal was constructed over the 1949 to 1953 period. The modifications are not expected to be extensive.

- *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.*

  No buildings, structures, or features of that nature are known in this portion of the NBID service area.

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

  No known archaeological sites are in the proposed project area.

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

  It is not anticipated that the proposed project will have any negative effects on low income or minority populations.

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

  The proposed project will not limit access or have any other adverse impacts on tribal lands.

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

  The proposed project is no expected to have any influence on the propagation of noxious weeds or non-native invasive species.

Required Permits or Approvals

The gallery wells for both the South of Superior and East of Superior areas will be subject to State law, and construction of these features will follow appropriate regulations with respect to both groundwater and surface water. The precise location for the gallery wells has not yet been determined, and the proximity of the wells to the Republican River will determine whether they will need to be permitted as groundwater wells, with appropriate permitting and registration by the Lower Republican NRD and NeDNR, respectively, or if they will be considered surface water diversions subject to the State's prior appropriation laws and regulations. Either way, both the NRD and NeDNR have indicated strong support for this Project, as documented by their letters of support (included with this application). The sites for the gallery wells are outside of the well moratorium outlined by the Final Settlement Stipulation (FSS) submitted by the three Compact states to the U.S. Supreme Court in 2002, and are as a result not subject to the restrictions associated with that provision. If the wells are treated as surface water diversions, all appropriate measures will be followed to ensure compliance with State law and regulations, and to prevent any negative third party impacts on the small number of private surface water appropriators in the area.

Any necessary easements, land use authorizations, or special permits will be obtained in a manner consistent with 43 CFR Section 429 and other State and federal laws and regulations.

Letters of Project Support

Letters of commitment and support from the Nebraska Department of Natural Resources, the Lower Republican Natural Resources District, and Frenchman Cambridge Irrigation District can be found at the end of this proposal.

Official Resolutions

A Resolution approved by the NBID Board of Directors is included at the end of this proposal.

Unique Entity Identifier and System for Award Management

The unique entity identifier for NBID, registered under the System for Award Management (SAM), is included below:

Entity Identifier: 43KT4

NEBRASKA

Good Life. Great Water.

DEPT. OF NATURAL RESOURCES

Pete Ricketts, Governor

September 4, 2020

Tracy Smith, Business Manager
Nebraska Bostwick Irrigation District
1147 West Highway US-136
Red Cloud, NE 68970

Dear Tracy:

Please consider this message a formal Letter of Commitment from the Nebraska Department of Natural Resources (NeDNR) to provide up to $2,500,000 of matching State funds upon approval of your Bureau of Reclamation WaterSMART grant application for the Superior Canal Delivery Efficiency Improvement Project, under the Water and Energy Efficiency Grants program (BOR-DO-21-F001). Projects like these provide multiple benefits across the basin, including more robust water operations, enhanced drought response capabilities, and long-term water sustainability and irrigation efficiency improvements – all using well-established principles of conjunctive management. These efforts also strongly support NeDNR's commitment in promoting long-term sustainability of irrigation uses in the project area through existing planning efforts, with include the Integrated Management Plan (IMP) for the Lower Republican Natural Resources District and the recently adopted Republican River Basin-Wide Plan.

Matching State funds from NeDNR will be available to the applicant immediately upon successful award of the WaterSMART grant application, as the funds are currently included within the agency budget. There are no time constraints on the availability of these funds, and there are no other contingencies associated with this funding commitment.

NeDNR staff look forward to working with your district to develop a contract that implements this financial commitment, pending approval of your WaterSMART grant application. Once again, NeDNR fully supports your district's efforts to improve the delivery efficiency of your Superior Canal, and appreciates your ongoing efforts to support the State's IMP and Basin-Wide Plan goals.

Sincerely,

Jesse Bradley
Interim Director

Jesse Bradley, Interim Director
Department of Natural Resources
301 Centennial Mall South
P.O. Box 94676
Lincoln, Nebraska 68509
OFFICE 402-471-2363
FAX 402-471-2900
dnr.nebraska.gov

LOWER REPUBLICAN NATURAL RESOURCES DISTRICT

August 25, 2020

Mr. Jesse Bradley
NE Department of Natural Resources
301 Centennial Mall South
P.O. Box 94676
Lincoln, Ne 68509-4676

Dear Jesse:

The Lower Republican Natural Resources District (LRNRD) supports the proposed WaterSMART Grant application to improve water and energy efficiency in the Lower Superior Canal region of the Nebraska Bostwick Irrigation District (NBID). We understand that these proposed water savings projects will create additional opportunities to keep more water in Harlan County Reservoir. This not only helps the state of Nebraska meet Republican River Compact requirements but also helps our LRNRD constituents.

According to the information provided by the Nebraska Department of Natural Resources (NeDNR), the potential water benefits would be significant. The goal of all the NRDs in the Republican Basin is to manage consumptive use and we support all projects helping us move in that direction. We believe there is great potential for beneficial projects in this area helping to stabilize water supplies for NBID, LRNRD, and the state of Nebraska.

We appreciate the NeDNR commitment to both surface water and ground water users in our district and support the WaterSMART grant application.

Sincerely,

Todd R. Siel
General Manager

Frenchman Cambridge Irrigation District

www.fcidwater.com

"Water is Life"

September 8, 2020

Bostwick Irrigation District in Nebraska
1147 W. Highway 136
P.O. Box 446
Red Cloud, NE 68970

Reference: Support for WaterSMART Grant Application

Tracy:

This is a letter of support for the Bostwick Irrigation District In Nebraska (NBID) Grant application for supplemental groundwater wells for project acres under the Superior Canal. Frenchman Cambridge Irrigation District, as a basin stakeholder, is interested in sustaining the water supplies of the Republican River Basin for all water users. This project helps with several of the Republican River Basin-Wide Plan goals and objectives and helps insure a long-term water supply.

Projects like this increase certainty for long-term water supplies and reduce the need for heavy handed regulatory actions; increase collaborative efforts among water management entities and stakeholders within the Basin.

Long term viability of irrigated agriculture in the Republican River Basin is paramount to all residents of the Basin and the State. FCID encourages and supports the NBID's efforts to increase efficiency in water management efforts.

Sincerely,

Brad Edgerton, Manager
Frenchman Cambridge Irrigation District

Bostwick Irrigation District in Nebraska

P.O. Box 446, Red Cloud, Nebraska 68970
Phone/Fax (402) 746-3424

RESOLUTION FOR WATERSMART GRANT PROGRAM:

Application No. BOR-DO-21-F001 Fiscal Year 2021
September 30, 2020

WHEREAS, the Bostwick Irrigation District in Nebraska is a legally organized irrigation district in the State of Nebraska, and

WHEREAS, the District promotes, supports and encourages water conservation, and

WHEREAS, the District has suffered through a drought that allowed no/limited irrigation in 2004, 2005, 2006, 2007, 2014, 2015 and

WHEREAS, the District urgently needs system improvements to maximize the utilization of a limited water supply and help sustain the viability of the project.

THEREFORE, BE IT RESOLVED that the Board of Directors of the Bostwick Irrigation District in Nebraska agrees and authorizes that:

1. The Board has reviewed and supports the application proposal to the WaterSMART Grant Program;
2. The Board authorizes the District Manager, Tracy Smith, the legal authority to enter into the WaterSMART Program Grants agreement;
3. The Bostwick Irrigation District in Nebraska is capable of providing the in-kind services and matching obligations, along with the State of Nebraska;
4. If selected for a WaterSMART Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED: September 02, 2020

Walter Knehans, President

ATTEST:

Lee Fintel, Secretary

"Water is Life"