CONVERTING

RIDGE 5.0 & C 5TH – 52.3 L

OPEN CANALS TO BURIED PIPE SYSTEMS

Funding Opportunity Announcement No. BOR-DO-17-F011

WaterSMART Grants: Small-Scale Water Efficiency Projects for Fiscal Year 2017

APPLICANT:

KANSAS BOSTWICK IRRIGATION DISTRICT

528 MAIN STREET

COURTLAND, KS 66939

PROJECT MANAGER:

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Executive summary

Date: February 20th, 2017 **Applicant Name**: Kansas Bostwick Irrigation District

City: Courtland **County:** Republic **State:** Kansas

Through the activities outlined in this application, Kansas Bostwick Irrigation District (KBID) plans to convert two open canals into buried pipe systems. Both projects concern specific canals that previously have had small portions of their entire length converted to piped systems. This project will finish converting the canals to completely piped systems. If successful through this application, the funding awarded will be used to purchase materials needed to complete this project. This project accomplishes one of the specific goals outlined in the FOA through the piping of canals to conserve water.

If successful through this application, the project will begin following the 2017 irrigation season and will be completed, at the very latest, by the end of May 2019.

The proposed project takes place within and as part of KBID which is a Bureau of Reclamation Irrigation District. Since inception, KBID has had perpetual easements and right-of-way for its canal system which passes through private landowner property.

Background Data

The maps showing the geographic location of the proposed project area are located at the end of this application.

Kansas Bostwick Irrigation District (KBID) is a Pick-Sloan Project headquartered in Courtland, Kansas. The district is served by flows of the Republican River and White Rock Creek. The district holds Water Rights #385 and #4673 with the State of Kansas and is strictly used for agricultural irrigation. As with most irrigation districts reliant on surface streamflow and subject to changing climatic conditions, the total quantity of water supply that is manageable each year varies. However, under water right #385 for flows of the Republican River, KBID is able to manage up to 102,521 acre-feet annually if it is available. Through water right #4673 for flows of White Rock Creek, KBID is able to manage up to 19,700 acre-feet annually.

KBID consists of approximately 100 miles of unlined open main canals, 50 miles of unlined open lateral canals and 100 miles of buried PVC pipeline providing service to 42,500 acres of cropland in Republic and Jewell Counties in Kansas. The three primary crops raised in the district are Corn, Soybeans and Alfalfa. There are approximately 350 landholders served by the district through approximately 675 field turnouts. KBID considers 15" per acre to be a full supply for its irrigators, however, in most of the last 25 years, restrictions have been imposed on irrigators in the district due to short water supplies.

The Republican River Basin remained embroiled in controversy over groundwater depletion of river flows from the late 1990s until the latest Supreme Court Settlement on the issue that was delivered in 2015. That particular ruling stated that Nebraska had not delivered the prescribed amount of water to Kansas. For its overuse of allocation, the Court ordered Nebraska to pay Kansas $5.5 million. While the ruling went in favor of Kansas, it didn't not bring back the water that Nebraska overused in the past. While relations on the issue between the states have recently improved, the most recent Supreme Court action leaves compact compliance in the hands of the State of Nebraska. Kansas, and therefore KBID's supply in water-short years, is now based upon the State of Nebraska's forecast of water availability and ability to augment river flows by shutting off surface projects and ordering water released from reservoirs in Nebraska to deliver "Compact" water to Kansas, as well as pumping groundwater from two augmentation facilities. The only tool KBID has to answer the problems created by this controversy and to protect what supply is available annually, is to continue improving the district's efficiency and conserving water, primarily through projects like the one outlined in this application.

KBID has previously worked in conjunction with the Bureau of Reclamation on numerous Water Conservation Field Services Program opportunities the district has been awarded. Under a 2025 challenge grant applied for in 2006 and awarded in 2007, 9 miles of large laterals were buried by the fall of 2010. An estimated 22.2 miles of laterals have also been buried under Field Service Agreements in the last 18 years. In addition, the district has buried 68 miles of laterals without assistance from Reclamation. Currently the district is completing the burial of 3.84 miles of lateral canals with assistance from a Field Service Agreement awarded in 2016. With the approval of this application, continuity may be maintained in the district's goal of converting open canals to buried pipe systems.

Project Description

Previously, small portions of both of the lateral canals identified in this project were partially converted to piped systems.

In the spring of 2006, the initial 1,125 feet of the Ridge 5.0 lateral canal was converted to a 15" buried PVC pipeline, leaving the remaining 2,620 feet in operation as an open canal. Likewise, in the spring of 2012, the initial 1,850 feet of the Courtland 5th-52.3 Left lateral was converted to an 18" buried PVC pipeline leaving the remaining 4,250 feet in operation as an open canal.

There are many reasons KBID would like to complete the conversion of both of these open canals to entirely buried pipe systems. Along with the most recognizable objective of water savings, due to diminished seepage, mitigated operational spills, and evaporative losses, this project would also mitigate operations and maintenance costs for the district. Once an open canal is converted to a piped system, there is no longer the need to perform all the required duties to maintain the canal such as mechanically removing debris within the profile of the canal or spraying herbicides into the local environment to control various species that thrive in the micro-ecosystems created by the use and operation of open canal systems.

The most easily measured result and expectation of the project will be identified through the conservation of water. Seepage and evaporative losses in these two stretches of open canal are estimated to be at a rate of 1 cubic foot per second per mile. Using an 80 day irrigation season, and the 1.3 mile total distance of open canal to be eliminated by this project, one gets an annual water savings of 208 acre-feet. This project will also eliminate two waste-ways and therefore their associated operational spills. By using a conservative figure of 0.5 cubic feet per second as the operational spill amount over both waste-way weirs each day of an estimated 80 day irrigation season, this project will save an additional 160 acre-feet of water annually. Therefore, by combing the amount of water saved from seepage and evaporative losses with the amount of water saved by eliminating operational spills through waste-ways, it is expected that a minimum of 368 acre-feet of water would be conserved annually by completing this project.

As pipelines are a much less labor intensive way to deliver irrigation water as well as being more reliable than canals, KBID can expect to provide more consistent water delivery while using fewer man-hours to do so following completion of this project. The district will also benefit by no longer having to buy the chemicals needed to control vegetative species in the open canal. Likewise, following project completion, the district will spend less on fuel for pickups and other equipment used for standard operation and maintenance. Both of these points have obvious ancillary benefits to the environment with the mitigation of chemical injection into the environment and less carbon emission by internal combustion engines.

Work will begin 1,125 feet downstream of the head gate of Ridge 5.0 lateral and 1,850 feet downstream of the C 5th – 52.3 Left head gate. The burial project will proceed from the initiation points on each canal to the terminal end of each. The project area is better illustrated by consulting the attached and included maps and aerial photos.

With the previous experience completing these types of projects and the skill of the KBID staff, along with owning the full line of equipment required, none of the project tasks will require any labor or machinery support outside of the district's own work force & equipment.

The initial project activity will be site preparation. This includes bull dozer and patrol work to prepare the alignment of the proposed buried line and excavator work to remove existing structures. Removed structures will be broken with the KBID crane and wrecking ball if they are too large to load and haul. Structures will be loaded with the KBID loaders into dump trucks and taken to an established scrap yard. Also included in task 1 is the stockpiling of pipe and materials to be used on the project.

The second major undertaking of project activity includes the use of the KBID trencher to create the trench line for the pipe. An excavator with a sling is used to swing the pipe into the trench and align the pipe to be pushed together. Finally a bull dozer or patrol is used to backfill the trench.

The final part of the project includes picking up any and all scrap or excess material left on the site and leaving the site in a manner that the landowner can further shape the earth with his own farm equipment if he so chooses.

Evaluation Criteria

E.1.1. Evaluation Criterion A—Planning Efforts Supporting the Project (35 points)

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

With the approval of this application, continuity may be maintained in KBID's goal of converting open lateral canals to piped systems to further the objective of conserving water. As stated earlier in this application, KBID has previously worked in conjunction with the Bureau of Reclamation on numerous Water Conservation Field Services Program opportunities the district has been awarded as well as the 2025 challenge grant awarded to KBID in 2006.

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

This project will finish the remaining portions of previously and partially piped open canals to convert them to completely piped systems. The award available thought this FOA will allow KBID to maintain continuity in the goal of converting all feasible lateral canals to piped systems.

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

The project outlined in this application has been determined as a priority in KBID's existing planning efforts due to the size of funding needed to complete the project in regards to the dollar amount available through this FOA. In addition, the canals outlined to be converted to pipe in this application have become troublesome in the past many years in regards to their ability to maintain consistent delivery volumes.

E.1.2. Evaluation Criterion B—Project Benefits (35 points)

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

As stated earlier in this application, there are many reasons KBID would like to complete the conversion of both of these open canals to entirely buried pipe systems. Along with the most recognizable expected objective of water savings, due to diminished seepage, mitigated operational spills, and evaporative losses, this project would also mitigate operations and maintenance costs for the district and have ancillary benefits to the environment.

- What are the benefits to the applicant's water supply delivery system?

It is expected that a minimum of 368 acre-feet of water would be conserved annually by completing this project. The pipeline will also increase the consistency of delivery to the specific field turnouts involved as well as increased pressure to those turnouts. In contrast to delivering water through constant head orifices as is currently done, following the project, the water will be delivered though geared butterfly valves and flowmeters with needle-dial readouts.

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

- Extent to which the proposed project improves overall water supply reliability
- The expected scope of positive impact from the proposed project (e.g., local, sub-basin, basin)
- Extent to which the proposed project will increase collaboration and information sharing among water managers in the region

While the projected annual water saving of 368 acre-feet is not a colossal amount in the big scheme of things within the basin, every bit of conservation effort does have a positive long term cumulative effect on the available water supply for all water users reliant on flows of the Republican River. Bostwick Irrigation District in Nebraska (NBID) is also reliant on the same source of water as KBID. Therefore any savings realized by either irrigation district can and are potentially realized by the other as an increase in overall water supply year in and year out with a higher degree of annual reliability. The positive impacts from projects like this one can be felt throughout the local and sub-basin area of South Central Nebraska and North Central Kansas.

- Any anticipated positive impacts/benefits to local sectors and economies (e.g., agriculture, environment, recreation, tourism)

Obviously, the water savings experienced through this project in a cumulative effect with the plethora of other similar pipeline projects completed by KBID over the years, has in essence, extended each irrigation season. Therefore, in years of short supply, the amount of water available to irrigate crops with, went further. This has the effect of increasing crop yields which subsequently helps the local economy which is almost solely reliant on agriculture.

Along with the positive benefits to the local economy reliant on agriculture, pipeline projects like this one also have allowed for more water to be stored in KBID's supply reservoirs later into each summer allowing for increased recreational opportunities like water skiing and fishing.

Another often overlooked benefit to these projects like the one outlined in this application is the elimination of the need to chemically maintain the vegetation that invades the micro-ecosystems associated with open canals. Thus, the environment experiences a benefit by not being subject to the added injection of chemicals used to control certain vegetative species.

E.1.3. Evaluation Criterion C—Project Implementation (15 points)

• Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

Work will begin 1,125 feet downstream of the head gate of Ridge 5.0 lateral and 1,850 feet downstream of the C 5th – 52.3 Left head gate. The burial project will proceed from the initiation points on each canal to the terminal end of each. The project area is better illustrated by consulting the attached and included maps and aerial photos.

The activity and work involved in completing the proposed project will include three major tasks as follows:

Task 1 - Site Preparation – will begin in the fall of 2017
Task 2 - Laying the pipeline and installing turnouts – as soon as possible following Task 1
Task 3 - Concluding tasks of the project after the pipe is laid – will conclude no later than May of 2019

As a general rule, the duration of each portion of the project is estimated in the following manner: Task 1 represents 30% of the project, Task 2, 60%, and Task 3, 10% of the project.

Task 1 preparation includes bull dozer and patrol work to prepare the alignment of the proposed buried line and excavator work to remove existing structures. Removed structures will be broken with the KBID crane and wrecking ball if they are too large to load and haul. Structures will be loaded with the KBID loaders into dump trucks and taken to an established scrap yard. Also included in task 1 is the stockpiling of pipe and material to be used on the project.

Task 2 includes the use of the KBID trencher to trench the line for the pipe. A bull dozer or patrol is used to backfill the trench. An excavator with a sling is used to swing the pipe into the trench and align the pipe to be pushed together.

Task 3 includes picking up any and all scrap or excess material left on the site and leaving the site in a manner that the landowner can work it with his farm equipment. Any open lateral, which is not in the alignment of the pipeline, will be destroyed in task 3 and left in a manner that the landowner can work the area with his farm equipment and returned to the farmer's operations.

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

No permits have been identified to be needed for this project.

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

As with all pipelines KBID has installed in the past, this one shall be installed following the manufacturer's design criteria. If the application is successful, an engineer will review the design. All meter installations shall meet State of Kansas specifications.

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

E.1.4. Evaluation Criterion D—Nexus to Reclamation (15 points)

• How is the proposed project connected to a Reclamation project or activity?

• Will the project help Reclamation meet trust responsibilities to any tribe(s)?NA

• Does the applicant receive Reclamation project water?

- Is the project on Reclamation project lands or involving Reclamation facilities?
- Is the project in the same basin as a Reclamation project or activity?
- Will the proposed work contribute water to a basin where a Reclamation project is located?

Kansas Bostwick Irrigation District (KBID) is a Pick-Sloan Project headquartered in Courtland, Kansas. KBID is a Bureau of Reclamation irrigation district served by and lying within the Bureau of Reclamation's Nebraska–Kansas Project Area headquartered in McCook, Nebraska. Water storage for the district is within the Corps of Engineers Harlan County Reservoir in Nebraska and in the Bureau of Reclamation's Lovewell Reservoir in Kansas.

Environmental and Cultural Resources Compliance

Construction of Kansas Bostwick Irrigation District was done in several phases. The first phase of the project, or Block I, was completed in 1957. The final phase of the project, or Block IV, was completed in 1969. As one can imagine, the construction of approximately 250 miles of canals and water delivery structures through previously unirrigated land caused a significant impact to the local environments where the construction originally took place.

At KBID, we like to think that through the conversion of open canals to buried pipe systems, we are returning the local environment surrounding these projects to the way they existed prior to canal construction, but still with the benefit of irrigation for increased crop production.

The proposed project should have minimal impact on the surrounding environment. The earth-disturbing work that will occur through the project will be to excavate a trench to lower the pipe into. After the pipe is placed in the trench, it will be back-filled by a bull-dozer or front end loader. The remaining profile of the open canal will be eliminated by a bull-dozer and along with a patrol, will be used to smooth and feather out the soil that previously made up the canal channel and profile. The only way in which air quality should be affected through the project is any dust that may be kicked up by tires or tracks of the machines while they are in operation.

The Summary of the Final Environmental Impact Statement for the Republican River Basin in conjunction with the Repayment and Long-Term Water Service Contract Renewals that was published in June of 2000 didn't identify any Threatened or Endangered Species in our area of the basin and to this day there are no known to exist.

There are no wetlands or surface waters inside the project boundaries that fall under the Clean Water Act jurisdiction as "Waters of the United States" that would potentially be impacted by this project.

There are no known archaeological sites in the proposed project area.

The proposed project will have no effect on low income or minority populations.

Budget Narrative

Jared "Pete" Gile is the Superintendent of KBID and will be the Project Manager. He will be in charge of the day to day operations of the project and will be assisted by on-site foremen. Office Manager, Tracie Nelson will be in charge of tracking specific figures and costs as the project unfolds. Both individuals have operated in the same role in previous projects of this nature so their salaries are included in direct costs of the project along with the field crew. Field crew hours and the subsequent associated salary and fringe benefit figures were calculated using actual project numbers from previous projects of similar size completed by KBID. KBID has buried laterals with its equipment and crew for many years.

The labor rates included for all personnel is certified to be the actual labor rates of each individual identified in this application. Also included in the above table are the actual fringe benefit rates for each individual which includes Health coverage, FICA, and KPERs retirement.

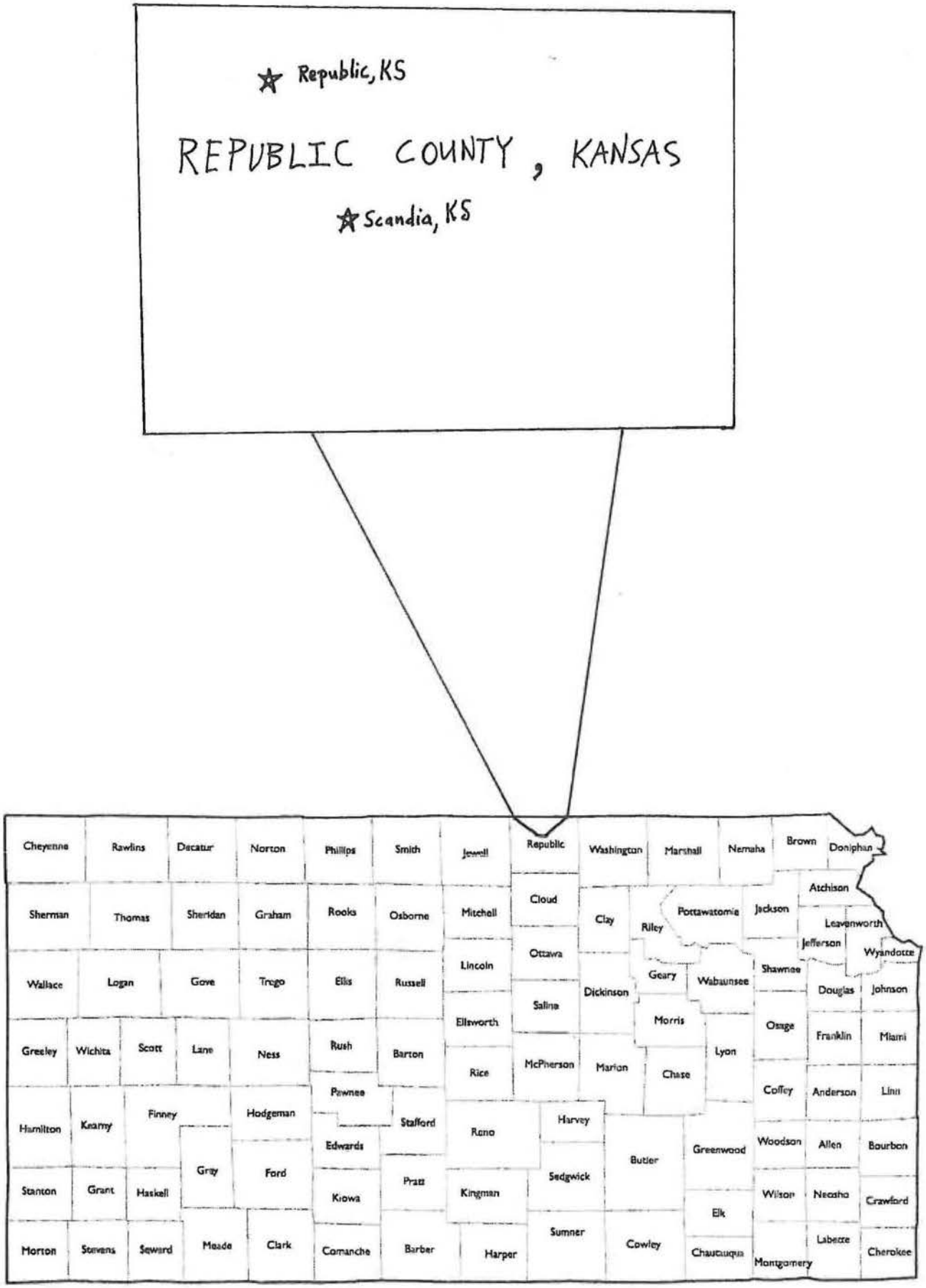
As KBID owns all the necessary equipment and machinery that will be required in this project, none will have to be rented. KBID established hourly rates for this application by using rates established by the United States Army Corps of Engineers within their Construction Equipment Ownership and Operating Expense Schedule.

All of the materials and supplies needed for the project are listed above in the Budget Proposal Table. The supplies are itemized by major category, unit price, quantity and purpose. All items are those that will be used in the field for accomplishing the goals of this project. All costs were derived from actual product costs or by quotes received by KBID on each product within the last 365 days. No work will be done on this project by sub recipients, consultants, or contractors.

Since the proposed project does include ground disturbing activities, this application includes a line item in the budget proposal to cover any environment compliance costs that may arise, although none are foreseen. The suggested one to two percent amount of the total project cost was used, however, there are no environmental compliance activities expected since all activities will be occurring on ground where there currently exists a canal which already has right-of-way and easement authority and is within a Bureau of Reclamation District boundary.

No other expenses or indirect costs have been identified.

The total cost of the project is $138,233.26. Kansas Boswtick will contribute $76,012.62 to the project to cover the costs of salaries, equipment and environmental compliance measures associated with the project. Through this Funding Opportunity, KBID hopes to be awarded $62,220.70 to cover the costs of the materials and supplies needed to complete this conservation project.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Barber
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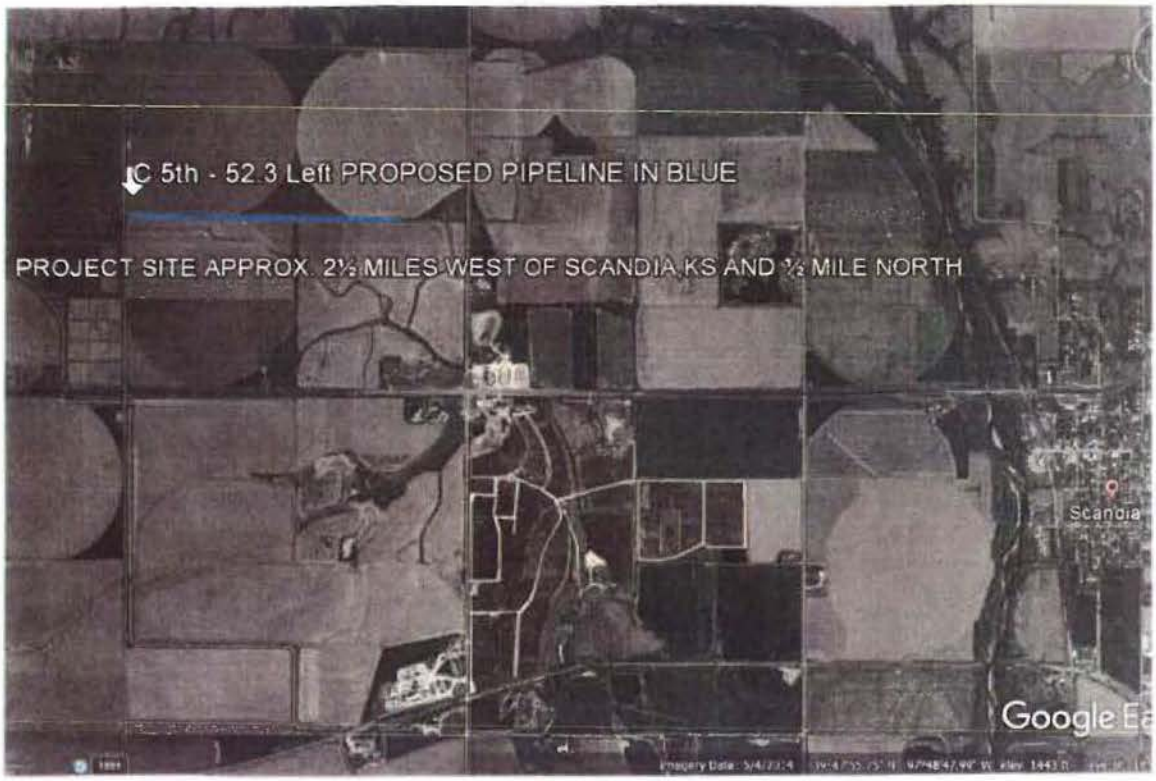
Sumner
Cowley
Chautauqua
Montgomery
Labette
Cherokee

Ridge 5.0 (NW of Republic, KS)

Courtland 5th - 52.3 Left (NW of Scandia, KS)



Unique Entity Identifier and System for Award Management

- Kansas Bostwick Irrigation District is registered in the System for Award Management (SAM)

- KBID's unique entity identifier
  - DUNS # 060765484
  - Cage Code: 4VUG0

KANASAS BOSTWICK IRRIGATION DISTRICT NO. 2

RESOLUTION NO. 2017-001

Whereas the Republican River Basin is frequented by drought,

Whereas water is the lifeblood of the agricultural community,

Whereas this WaterSMART grant would provide a source of funding for capital improvements of the District,

Whereas the converting of open ditch lateral canals to buried pipelines will conserve large volumes of water and improve efficiencies,

Whereas funding is needed to maintain continuity in the District's efforts to improve efficiency,

Now therefore be it resolved that the Kansas Bostwick Irrigation District No. 2 Board of Directors has reviewed, supports and authorizes that this application be submitted to the Bureau of Reclamation for the consideration under the **WaterSMART grant program for Funding Opportunity No. BOR-DO-17-F011**. If selected, the Board of Directors agree to provide district funding to the project and will work closely with Reclamation to meet all established deadlines.

The foregoing Resolution was considered by the Board of Directors of the Kansas Bostwick Irrigation District No. 2 at a meeting held on the 8th March 2017, and unanimously adopted.

BOARD OF DIRECTORS

Gary L. Housholder – President

Brad D. Peterson - Secretary

Monty D. Dahl - Treasurer