

*Nebraska Bostwick Storage Enhancement  
and Retiming Project*

**Webster County, Nebraska**

**Final Project Report**

**STATE OF NEBRASKA  
DEPARTMENT OF NATURAL RESOURCES  
NEBRASKA WATER SUSTAINABILITY  
FUND GRANT AWARD AGREEMENT  
NO. 5187**

**Bostwick Irrigation District in Nebraska  
P.O. Box 446  
Red Cloud, Nebraska  
March 22, 2022**

## **BRIEF SUMMARY**

This project involved the installation of precise flow measurement and control gates along the length of the Franklin Canal. These control and measurement gates are integrated into a radio telemetry network which provides real-time field measurement of water levels and flows along the length of the canal. A central computer utilizes this information to continually update real-time flow setpoints for each check structure along the length of the canal so that the supplied flows precisely match the downstream demand, and unintended operational spill is eliminated. Once the gates and supporting telemetry and control system were installed the resultant water savings were realized on an ongoing basis beginning one year after program commencement.

## **BRIEF DESCRIPTION OF RECIPIENT**

The Bostwick Irrigation District in Nebraska was built by the Bureau of Reclamation in the early 1950's. The District consists of 5 canals located and serving 22,455 acres in Nuckolls, Webster, Franklin and Harlan Counties in Nebraska. The District utilizes water from the storage of the Harlan County Reservoir and the natural flows of the Republican River. The Franklin and Naponee Canals receive water directly from the Harlan County Reservoir. The Franklin Pump Canal utilizes water via a pump station located along the Republican River. The Superior and Courtland Canals receive water by utilizing the Guide Rock Diversion Dam. The District headquarters is located in Red Cloud, Nebraska.

## **PROJECT DESCRIPTION**

The project fitted new flow measurement and flow control actuation to existing concrete check structures. These structure upgrades did not modify the structural loading of the upgraded check structures, and so there was no requirement to undertake a structural or foundation assessment on these existing check structures. Where new structures were proposed, they were designed and constructed in accordance with existing approved plans to match existing check structures with consideration given to local geology and footing construction requirements.

## **COMPLIANCE WITH PROJECT GOALS**

Most of the goals and objectives of the project were met. Operation of the gates was previously a manual exercise conducted by the Nebraska Bostwick Irrigation District ("NBID"). The project objectives were to automate so that a) the site could be remotely monitored by NBID on a system accessible to both, b) gates could be repositioned as needed to account for the variability in usage and diversions, and c) provide a safer means of control during times of inclement weather. The end result met these project objectives. However, the Corp of Engineers refused to allow the automation of the two adjusting valves from the reservoir, so full automation was not possible. It is hoped that in the future, we can convince the COE of the added benefits of automating the valves.

**How the project demonstrates collaboration, if applicable**

This project is quite a showcase in collaboration. As is known, the sharing of the Republican River and compliance of the compact has been a point of contention over the years, to the point where it has been taken to court to resolve. The install of this project was, to the best of our knowledge, the first time a NRD and a Surface Water District collaborated in an effort to conserve water. NBID and LRNRD worked together with DNR in terms of planning and management – both districts have been able to sit at the table together to discuss and agree upon operation strategies, and the implementation of the automation allows for both districts to truly realize water conservation and savings. There is also a public/private partnership in implementation as Rubicon Water was brought in to provide not only the solution, but ongoing support through both local service as well as ongoing cloud-based SCADA services that are customized for the site.

**Describe how the project helps to prevent conflict over water, including a brief description of any tension or conflict over water in the area**

This project will definitely help shore up the user water supply. For many years both of the Districts have suffered through declining inflows into the Harlan County Reservoir. By automating the gates, it will ensure that water will be captured and used in a more efficient manner, thereby reducing waste.

**Describe any other pertinent issues regarding the project**

This project will be valuable to the Districts, Basin, States, Reclamation and other users of surface water. It is a giant step in collaboration between both of the Districts and States and more is needed. I would hope the success of this project on all levels should demonstrate the valuable need for the program.