URNRD Remote Water Monitoring and Efficiency

Annual Report, March 2021

Water Sustainability Fund Application #5221

The URNRD was awarded a $375,336 grant by the Natural Resources Commission in December 2018 and executed a contract with the Department of Natural Resources in February 2019. The project entails equipping irrigation well flow meters throughout the district with radio-based telemetry units so that water management is improved with real-time water usage information provided to irrigators, and the URNRD.

Project Progress

Throughout 2020 and to date, no Water Sustainability Fund (WSF) resources have been expended on the project as we continue to utilize federal grant funds. Those funds will be exhausted within the next few months, and in the fourth quarter of 2021 we expect to begin utilizing the WSF grant to purchase and install project-related equipment. Our experience over the last three years installing the equipment has streamlined our installation processes and improved our understanding of how it operates. This will be beneficial as we enter the WSF-phase of the project.

There are approximately 3,300 irrigation wells within the URNRD and pursuant to our rules, all are required to be equipped with flow meters to measure water usage relative to our limitations on usage. To date, approximately one-third of the meters have been equipped with the necessary telemetry hardware and all of those are actively communicating water-usage data. We've chosen to use an existing radio network instead of cellular or satellite communications to reduce monthly data fees and improve communications reliability, at least compared to cellular communications.

Radio-network infrastructure costs have been non-existent to date because of cooperation from two Colorado-based electric utilities who have already developed the necessary infrastructure to automate readings from their electrical meters. The URNRD telemetry units send signals to the radio towers owned and operated by Highline Electric Association and Y-W Electric Association, and the URNRD pays the two utilities a portion of the operations and maintenance costs associated with the towers that are used. We have been verry pleased with the reliability and robustness of the network.

The picture on the first page of this report shows the units that are being installed. The white, cylindrical piece mounted to the horizontal irrigation pipe is a digital meter head that captures and stores water usage data generated by a traditional, prop-style water meter. It replaces an odometer-style head that must be manually read to collect water-usage information. A sensor placed inside the bearings of the prop-style meters logs usage detected by the prop and relays information to the digital meter head. The digital meter head is connected via cable to a radio module that relays the data to the URNRD using a network of radio towers owned by an electric utility that provides service to much of our NRD. The radio module in the photo is the box mounted to the top of the pole.

Upcoming Activities

Installing the new meter heads and sensors located within the bearing near the prop of the meters requires removing the meters from the field and bringing them to the shop. This makes it impractical to do any installation during the spring and summer irrigation season. Over the next several months we may test some new meter equipment, but won't install any telemetry units. Beginning in the summer, we will select areas of the district to install telemetry units, order the needed equipment, and begin installation in the fall. Also, during the spring and summer, we will finalize a decision on a cloud-based storage system for the collected data.

Once installation begins in the fall, we expect to be able to install approximately 400-500 units in preparation for the 2022 irrigation season.

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