

URNRD Remote Water Monitoring and Efficiency Annual Report, March 2020

WSF Grant 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

All 3,300 irrigation wells in the URNRD are required to have flow meters to ensure water use doesn't exceed water allocations established by the URNRD. To date, approximately 800 of those meters have been equipped with telemetry units that are the same type that will be purchased and installed using the Water Sustainability Fund grant. Approximately 500 of the 800 units installed so far have been installed since the last grant report one year ago. Units deployed thus far have been purchased with aid from a federal grant; when those funds have been exhausted we will begin using the WSF grant. The federal grant expires in July 2021. However, we expect to use all federal grant funds by the end of this year or early 2021, putting us in position to begin expending WSF funds in 2021.

Our experience indicates that approximately 500 telemetry units per year can be installed by our technicians. Installation is limited to November-May, approximately, when farmers are not irrigating. Using this schedule, we anticipate using all available WSF funds by early 2023.

The picture on the first page of this report shows the units that are being installed. The white, cylindrical piece mounted to the vertical 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 tan-colored, square-shaped unit above and to the left of the digital meter head.

The electric utility that owns and operates the radio towers used to communicate water-usage data from the meters, Highline Electric based in nearby Holyoke, Colo., uses the towers for its automated electrical meter reading network. Within Highline's coverage area, there are 1,018 irrigation wells in the URNRD. Once telemetry units are installed and operating on the flowmeters for those 1,018 wells, monthly communication costs under the tentative agreement with Highline Electric will be approximately \$1.08 per month, per flow meter. This compares very favorable to monthly cellular or satellite communications costs of \$4.50-\$6 per month. The hardware for satellite or cellular based telemetry units cost approximately twice as much as radio-based units.

Upcoming Activities

Usage data received directly by the URNRD allows us to monitor communication reliability of the system, which will occur during the upcoming irrigation season. We also plan to test a LoRaWan radio network being deployed statewide. If it proves effective, it could offer benefits to farmers by allowing them to transmit data from other devices besides flow meters, such as weather stations, soil moisture probes, etc. Initial conversations with developers of the network indicate monthly communication costs would be similar to the system we are currently using.

As the irrigation season progresses, we will select which well sites are next in line to receive the telemetry upgrades. Then we will order the necessary equipment in mid-to-late summer to ensure equipment arrives in time to begin installation this fall and winter.

Thank you for the opportunity to update you on the project and please feel free to contact us with any questions.