# URNRD Remote Water Monitoring and Efficiency

**Annual Report**

*DNR Contract 1107*

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

Thus far, the URNRD has installed approximately 300 telemetry units that are of the same type that will be purchased and installing using the Water Sustainability Fund grant. The 300 units were purchased previous to receiving the WSF grant and reimbursement from the fund will not be requested for those units. It is difficult and inefficient to install the telemetry units during the irrigation season of June-September while flow meters are being used, so we currently plan to begin purchasing and installing units under the WSF grant in the fall and winter of this year. Using the 300 units already installed this summer will give us an opportunity to identify and rectify any issues with the telemetry system to prevent similar issues with units purchased with aid from the WSF grant.

The picture above shows the equipment that will be 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 a nearby Colorado electric utility and, soon, the URNRD, using a network of radio towers. The radio module is the square-shaped unit at the top of the vertical metal pole in the picture on the previous page.

Since the grant was awarded, the URNRD has reached an agreement in principle on the use of the radio towers. The cost to the URNRD will be equal to the number of URNRD telemetry units as a percentage of total units using the radio network. The electric utility that owns and operates the towers, Highline Electric based in nearby Holyoke, Colo., uses the towers for its automated 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 costs approximately twice as much as radio-based units.

Since the grant was awarded, the URNRD has also began to identify possible tower locations that could be used to allow for a district-wide telemetry system using the same technology.

## Upcoming Activities

Over the upcoming irrigation season, the URNRD will closely monitor the communication reliability of the radio network utilized by the existing, 300 telemetry units. That will be made much simpler once we have our own network interface. This is expected to occur within the next two months. Currently, data from the flow meters goes directly to Highline Electric, which then relays the data to us. Once we have our own network interface we will have access to a plethora of information: Hourly water usage information, what radio towers individual well sites are communicating with, error codes, etc. This will be very helpful in monitoring and learning about the operation of the system.

As the irrigation season progresses, we will select which well sites are next in line to receive the telemetry upgrades using WSF funds and will order the necessary equipment. We expect at this point to order hardware needed to equip roughly half of the 780 flow meters in late 2019 and early 2020, and do the remaining ones in late 2020 and early 2021.

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

Nate Jenkins, URNRD