

# New System in Doniphan County Adopts GPS Mapping

Last May I received a call from Paul Rush, chairman of the board for the new Rural Water District No. 6 in Doniphan County. Paul was inquiring about an estimate on costs associated with KRWA conducting GPS mapping for the project that would begin installation later in 2016. Doniphan County is located in the extreme northeast corner of the state. While very hilly terrain, the county has some of the richest soil in the state. Progress on this project would not be slowed due to trenchers encountering rock. The district is relatively small with roughly 120 miles of pipeline and 230 service meters. The trenches for pipelines would be cutting through good looking soybean and cornfields. As it was the first time estimating a project that had not yet been installed, it was necessary to take many factors into consideration.

But, in trying to estimate conservatively (high) on all aspects, KRWA's cost still came in well below any competitor's. The district signed a contract and I was to begin collecting data for the district within a month.

In trying to do the project with a cost even lower than the estimate, I determined this could easily be accomplished by collecting close to ten miles of waterline each trip to the system. Time spans between trips have not been very uniform due to the excessive rain events that area has experienced in 2016. The area around Highland, Kan., which is in the heart of this new district's boundary, received more than ten inches of rain in less than 24 hours in early September. As you would expect, events such as that not only bring progress to a standstill, but also washes away some of the fresh trenchlines that need to be collected. Thankfully I was mostly caught up when that rain

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Workers with M CON, LLC, Wathena, Kan. install pipeline for the new Doniphan County Rural Water District No. 6 on a very warm day in July 2016.

event occurred. The district also has tracer wire throughout the system to remedy that issue.

The first trip to the system in mid-June consisted of an above average temperature at close to 100 degrees with high humidity. KRWA did not own an ATV or UTV when I began data collection in mid-June 2016. The task ahead for me was to walk the entire project. As you can imagine, that first day was one of those days when a person would probably drink his/her body weight in water, and never have to use the bathroom. I was still able to meet the goal and got close to ten miles collected, but it did take all day and was quite labor intensive. Upon discussing the future of the project with Stuart Porter, project engineer of Schwab Eaton, P.A., District Chairman Paul Rush and KRWA General Manager Elmer Ronnebaum, it was decided that I could use Paul's

ATV. Using the ATV would not only help me, but it also would relieve the project inspector, Mark Houser of Schwab Eaton, from having to spend a good portion of the day picking me up and dropping me off as I collect data. It is effectively allowing me to go out and accomplish the work on my own. After that, collecting ten miles of water line was taking a little over half a day, getting me closer to 14 miles per trip.



**The new rural waterlines in Doniphan RWD 6 cross some of the most fertile farmland in Kansas.**



**The new (used) Gator owned by KRWA has helped make the process of streaming GPS data collection go much faster than walking the entire project.**

Also in the planning stage in September 2016 is the new Public Wholesale Water Supply District No. 27, which will supply water to Doniphan RWD 6, Brown RWD 2, and several other water systems in the area. Public Wholesale 27 has also signed up with KRWA for their GPS mapping project. A total of 17 miles of water line has been designed for that project. With all of this new water line signed up for data collection, and discussion with Paul Rush who is also on the board for the Public Wholesale, KRWA decided to purchase a used UTV to help get the work done efficiently.

It might be asked why KRWA had not purchased a UTV before now? The answer is that other than use in a city doing data collection of manholes, it's the project to follow new trenches that created the incentive.

Last point. KRWA has advocated for ten years that new projects utilize GPS for their mapping. Many systems still want to install tracer wire – but tracer wire fails. And as the GPS technologies and methods to access data, now on smartphones, becomes more and more familiar to operators, there seems to be less and less purpose in having engineering firms drawing "as-builts" or the system trying to figure out where the tracer wire is broken. With good quality GPS, lines can be located quite efficiently and at less cost than other technologies.

### **Costs vs. estimates**

Relatively speaking, KRWA's estimates for GPS mapping have been not only reasonable but the final costs have been within the range of the estimate. In those case where the final costs exceeded the estimate, there have been other circumstances, such as doubling-back over projects when the owner found additional features to collect, or extra time spent trying to reconcile the project's GPS data with the utility's original as-built maps. The bottom line is that

KRWA's fees generally are a fraction of some other proposals and KRWA only charges for the time required on the project. And the city for RWD owns the data.

### **Upcoming training**

KRWA will be providing additional training sessions on GPS technology and use of that technology at various training sessions later this year and next. If your water district or city has interest in GPS mapping, I hope you will allow your Association, KRWA, to explain the processes and benefits. Give me a call at 785.336.3760 or email to me at mark@krwa.net. In the meantime, check out the GPS mapping process on KRWA's Web site at <http://krwa.net/TECHNICAL-ASSISTANCE/Mapping/The-Process>.

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