

Google Earth App and Digital Mapping Working Well for Washington RWD 2

Washington County RWD No. 2 started being constructed in 1985 and provided water through 207 meters in 1986 with 200 miles of pipe. Two wells provided water. The wells and a treatment building are all located on the same quarter section of land. The one elevated storage tank is still the sole means of storage today. In 1999 to meet the expanding demand for water, the district drilled two additional wells and added another treatment building and piping connected to the original system. The district encompasses the southern half of Washington

County and stretches into northern Clay County, surrounding Clay County RWD No. 1. Over the years, there have been numerous line extensions to reach new customers, as there are 367 meters today and 227 miles of pipe. Maps of the district include the original 1986 as-built plans, which have a few line extensions penciled in by hand, and as-builts for the 1999 supplemental water supply project.

Ned Peters has been managing the district since 1997, starting as a part-time operator for then-manager Delbert Beikman in 1994. As with a lot of smaller RWDs in the state, the staff includes only the operator/manager and a bookkeeper. Ned hadn't given much thought to upgrading the district's maps because of his adequate knowledge of the system. In the Fall of 2012, that changed when the district installed a new 6-inch line parallel to an original 4-inch line for three miles to provide more water to the north part of the district. This area experienced low pressure when a large dairy had to ramp up total usage from the district. Ned and the contractor had to locate the existing 4-inch to avoid hitting it when installing the new 6-inch line. Having marked the original 4-inch pipe and the new 6-inch line completely visible with a new trench, Ned recognized how valuable it would be to collect and archive these three miles of waterline locations with accurate GPS technology. Ned contacted KRWA to learn what it would cost to collect the data and produce a map.

The district agreed to hire KRWA to collect the data on this new project. They wanted to get it done before the flags and other markers disappeared. Even though the 6-inch line had tracer wire installed with it, Ned agreed that it would make sense to collect it simultaneously as the old 4-inch line. KRWA completed this small project and produced a map for the district. I then discussed the costs and resources required for mapping the entire district. Ned was interested in doing this, but it seemed to get put on the back burner while running the district's day-to-day operations.

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This graphic shows the installation of a newer 6-inch waterline (red) in Washington RWD 2 near Linn, Kansas. The green line is the original 4-inch line installed in 1985. It was necessary to locate the 6-inch because of roadwork to replace a bridge.

In the Fall of 2020, KDOT began replacing a bridge on the highway where I collected the two water lines, requiring Ned to locate these lines. The old 4-inch line angled out pretty far in the field away from the bridge for some reason, but the new 6-inch line would be critical to locate. Having problems with his tracer wire locator, Ned called me to see how he could use the GPS data for locating. I emailed him a kmz file for Google Earth and told him to download the Google Earth app on his phone. I stopped by to teach Ned how to utilize this free app. We drove out to the bridge; Ned practiced a little with his phone. The GPS feature with Google Earth allows users to know in real-time their location while also viewing water system data, making it easy to navigate or walk to certain meters, valves, or line points. On this particular afternoon, Ned's phone GPS seemed to be pretty accurate. I had to point out to Ned, and always mention that the GPS receiver capabilities on smartphones by themselves are not consistent when it comes to accuracy. I have seen them be right on, and have also seen them be five to ten feet off. A phone GPS receiver does not receive any GPS signal correction, so the accuracy will fluctuate throughout the day. I am frequently asked whether it is appropriate to collect GPS data with a cellphone. The

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answer is, "No!" What essentially happens is that the inaccuracy is doubled. If someone collects a point that is five to ten feet off of accurate, and then when trying to navigate back to that point with the same phone, you could be 10 to 15 feet off. Whereas if your data was collected with a sub-foot accurate unit, you will always know you'll be within a 10-foot circle with your phone, or if your district decides to invest in an accurate GPS unit, you know you'll have sub-foot data.

Ned was impressed with what the Google Earth app was able to offer. Also, that is free and easy to use were incentives. Having the entire district map and being up to date on the Google Earth app were realized as real benefits by Ned. Washington RWD 2 decided to collect and map the whole district. Data collection occurred last Fall and I just printed rough draft maps for Ned to review this winter. Ned had to learn the district the same way many other new operators have to. That is with time and experience. Whenever he decides to retire, the next person will have all of that knowledge on his phone. KRWA continues to work on many municipal and rural water district mapping projects. If any system is interested in getting their mapping into the digital era, give KRWA a call at 785-336-3760 or email me at mark@krwa.net.

Mark Thomas has been a GIS Mapping Tech since September 2006. Mark has a bachelors degree in geography from Kansas State University and has specialized studies in ESRI's ArcView and ArcPad software.

