

# GPS mapping beats the old drawing board days!

**K**ansas Rural Water's GIS/GPS mapping department has progressed steadily in the past couple of years. The three staff members, GPS Mapping Coordinator Pete Koenig and Mapping Tech Mark Thomas and I are using the most current Trimble GeoXH GPS technology. Map production has been a success and very beneficial to the many cities and rural water districts (RWDs) utilizing KRWA's services.

KRWA Mapping has completed 23 water or wastewater system projects for cities and 30 projects for RWDs. As of February 1, 2008, KRWA had 15 projects in the production stage and 23 projects on the books for doing data collection and map generation. A

very special project this year is infrastructure data collection for all towns in Jefferson County. Through agreements with the county, data collected by KRWA will be transferred to the Jefferson County GIS Department for data

interpretation. The unique project and its processes will be highlighted at the mapping preconference session at the 2008 KRWA Conference, March 25 at Century II in Wichita.

## Dickinson RWD 1: case study

A recent mapping project initiated by Dickinson RWD Operator/manager Eric Rush involved having the district's maps

regenerated prior to his leaving for a new job. Eric was concerned that future operators wouldn't have usable and accurate maps of the district. The original RWD was installed in 1974 with many

explain options and capabilities associated with digital mapping. A cost estimate of \$8,136 was presented to the district's board and staff. Cost estimates are based on the approximate number of points

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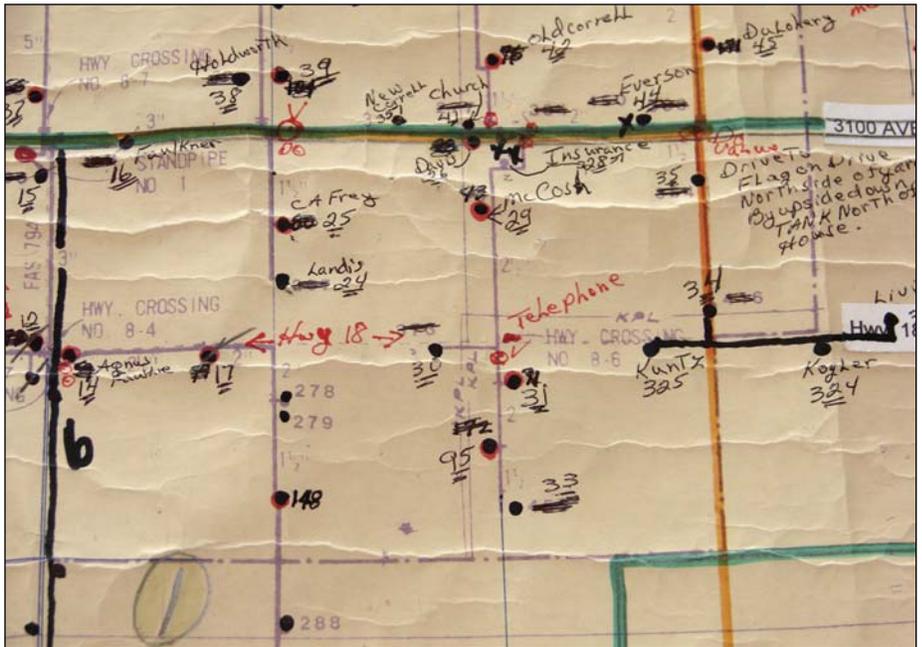
additional miles of pipeline and many new customers added over the years.

Eric contacted KRWA in April 2007 for more information and a cost estimate. KRWA staff attended a meeting of the RWD board to

involved. The estimate covered KRWA preparation time for GPS data collection, linking of features, prep and printing of a wall map, two map books and work to provide a final digital file to be installed on the district's computer.



Jesse Knight  
GPS/GIS Mapping Tech



The old maps for Dickinson RWD 1 are typical of many city and RWD maps in Kansas. The original project was constructed in 1976 and updated in 1989. Pencil notations were made on the district's old paper maps to indicate new customers or line additions.

An 'estimate' is an estimate and not a contract. KRWA's mapping presentation details how a project is internally funded and that KRWA Mapping charges are based on time required to complete a project. It is understandable that as a system discovers all the uses for data, additional data points find their way into the project in excess of the number originally requested by the client.

Dickinson RWD 1 approved and returned the estimate and KRWA agreed to begin data collection in May 2007. Typical of a good operator, Eric had located and marked valves, meters and other line points to be collected. Mark Thomas teamed up with district backup operator Dwight Benfer, while Eric and I made up the second team. Because of the excellent preliminary work, data collection was smooth and efficient, translating into direct savings for the district. The two teams collected some 1,400 points that included meters, valves,

cleanouts, lines and facilities. Pre-marking the features or at least knowing where they are located is critical to reducing time on the clock for mapping personnel. But if metal detectors and pic-axes

#### Final corrections

Following production of 'draft' maps, it's standard procedure to submit paper project copies to the client. After some client review time, a KRWA map tech, with

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become necessary to locate valves in the streets – we do that too.

Collected data was then taken to the KRWA office at Seneca. There we found that creating line shape files went very fast because we had collected GPS locations on 75% of the district's main lines. If no one in the process understands how pipelines or facilities are connected, this part of the job can take much longer.

laptop in hand, will visit the client with the electronic files for a more comprehensive file review. This is when the entire project is reviewed for accuracy with the utility's operator or manager. In some RWDs, board members also participate in the review.

After the electronic project review, KRWA will print a large wall map and a map book with one-meter color aerial



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The graphic above is a snapshot of the new digital map product recently provided to the Dickinson RWD 1 by KRWA. KRWA produced a wall map and a 'map book' and also provided the district with a digital file for viewing on the system computer. Future updates can be easily incorporated, as the map book is separable.

photography or higher resolution if available. The map book is bound in a manner that allows page replacements because of the need for future system updates.

Operators, managers, city council members and RWD board members are realizing how beneficial it is to have GPS system infrastructure data at their fingertips. Having updated maps is critical to good utility operation and maintenance. Utilities will likely expand over time and current maps are essential for

good planning prior to these expansions. It is easier to update a map when using digital data as GPS coordinates of infrastructure because GPS map features will never change.

System operators and managers will be able to coordinate within their system in a timely manner allowing an operator to easily locate and inspect the system. Whether it's checking for damaged or leaking customer read or radio read meter pits, looking for valves to exercise or inspect, or searching for main line leaks or locates, there is no substitute for quality maps. Sewer manholes can also be easily found for inspection for collapsed structures. Smoke testing can be performed for unknown sewer main breaks and operators can enter the results into a spreadsheet of needed infrastructure repairs. All these things will save any system valuable operator time and costs.

There are other sources than KRWA for utilities in Kansas to consider in developing a GPS mapping project. KRWA encourages your system to consider the benefits of having updated maps. Again, I hope that you will attend the preconference session that focuses on GPS mapping technology on Tuesday, March 25 at the 2008 KRWA conference. The entire conference runs from March 25-27. GIS mapping is very affordable; attend and learn more.

## GPS Mapping – being prepared reduces costs

In March 2007, the estimate for Dickinson RWD 1 was based on 1,050 collection points. At project finish, KRWA Techs had collected a total of 1,233 points or 183 more than the original estimate. The original cost estimate was \$8,136. A cost estimate based on 1,233 points would have been \$9,240. The actual cost of project time and materials tallied by KRWA was \$8,766.

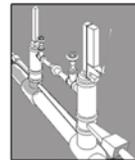
Estimates are always generated conservatively based on total points to be collected as requested by the client system. At the end of each project, a report is printed that reflects actual KRWA time and materials. That is the amount invoiced to the city or RWD. Sometimes it's higher, as in Dickinson's case, and sometimes the amount is less.

The sizeable Dickinson project required several months to complete. Manager Eric Rush wasted no time in correcting and returning client check plots. The result was the Dickinson project progressed much faster because other project clients were slower to return reviews of project draft maps; allowing Dickinson 1 to jump to the front of the line.

KRWA works on a first-come first-serve basis with systems. Systems that turn around the check (review) plots will receive completed maps a earlier than some clients who are less timely. One quick acting smaller city project was recently completed in two weeks. While KRWA's GIS Mapping continues to be more efficient, the degree of client preparedness is determined by the client city or RWD.

KRWA's GIS Mapping service doesn't stop with the delivery of map products and digital files. Association staff members are available to provide ongoing tech support as utilities continue to use and expand development of system GIS data including future system update planning.

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