

State: Kansas

Program Category: Water Resources

1. *Program Name:* Public Water Supply System GIS Mapping Grant
2. *Administering Agency:* Kansas Water Office
3. *Contact Person:* Tina Rajala, Environmental Scientist
4. *Address:* 901 S Kansas Ave, Topeka, KS 66612-1210
5. *Telephone Number:* 785-296-3185
6. *FAX Number:* 785-296-0878
7. *E-mail Address:* Tina.Rajala@kwo.ks.gov
8. *Web Site Address:* www.kwo.org

9. *Description of Program:* The Public Water Supply System GIS Mapping Assistance Program promotes modern mapping of small public water supply systems in Kansas. The program provides matching funds to qualifying systems to map public water supply infrastructure.

10. *How long has this program been operational?* Since September 2008.

11. *Why was the program created? What problem or issue was it designed to address?* The program was created when additional funding was allocated, beginning July 1, 2007, to the KWO program for technical assistance to PWS. At that time the State was still grappling with the effects of a devastating EF5 tornado that destroyed the town of Greensburg on May 4, 2007. One of the issues the town faced was the restoration of the PWS system. The water tower was destroyed by the tornado and hydrants were buried in debris. As cleanup crews began clearing the streets water pits were damaged by heavy equipment and functioning hydrants were bulldozed off the streets along with the debris. Weeks later, the gas company began locating service connections (by digging with a backhoe); and they cut through water service lines. The damage to the PWS infrastructure was significantly increased after the tornado because crews did not have maps in-hand showing the locations of lines and hydrants. Modern maps use aerial photography as the background. Although most buildings were destroyed by the tornado, the street network was still visible and could have been used with the maps to locate infrastructure. The maps at City Hall may have been destroyed, but new prints could have been made if a digital copy of the maps and data were stored at a remote location.

Emergency response aside, many small PWS systems have worn, outdated maps (or no maps) of their water infrastructure. This program was created to provide small public water suppliers (PWS) with an incentive to develop or update their infrastructure maps using geographic information systems (GIS) technology. Mapping of water supply infrastructure provides a number of benefits in addition to emergency response, including improved system operations and maintenance and the capability to more accurately respond to facility locate requests (such as Kansas One Call). The Kansas Water Plan has a goal to ensure that all PWS have the technical, financial and managerial capability to meet their needs and to meet the Federal Safe Drinking Water Act (SDWA) requirements. The Kansas Water Office (KWO) believes that accurate infrastructure maps with spatially referenced attribute data are another important tool in the effective management of a system.

12. *Describe the specific activities and operations of the program in chronological order.*
 - a. Small PWS systems with 1,000 or fewer customer meters may apply for a mapping grant of 50% of the cost of the project, up to \$4,000.

- b. The PWS must have a current, State approved water conservation plan. If the PWS needs to develop a plan KWO drafts the document and provides technical assistance for personalizing the plan. The mapping grant application is held pending the approval of the water conservation plan.
- c. The PWS must provide a detailed mapping proposal, including: the method of data collection; an estimate of the number of data points to be collected; a plan for backup storage of the data; and viewing software and training for the PWS to work with the resulting dataset. Data collection must meet Kansas Water Utility Data Standards and be in ArcGIS or OpenGeospatial Consortium (OGC) format.
- d. Approved applicants schedule the work to be done. When the project is complete the PWS will submit a detailed invoice for the project and a data collection summary that includes contact information for the mapping provider; the last date of collection; the reference system and datum; type and accuracy of the GPS unit (if applicable); and a description of the data collection method.
- e. The Kansas Water Office reimburses the PWS for 50% up to \$4,000 for the project.

13. *Why is the program a new and creative approach or method?* In addition to the on-site technical assistance provided by KWO, the Kansas Department of Health and Environment encourages PWS systems to improve their financial, technical and managerial capability through the Capacity Development Program, which provides training as well as planning assistance grants; and the PWS State Revolving Loan Fund (SRF) Program, which provides low cost loans for system improvements. The Kansas Department of Commerce provides Community Development Block Grants to public water suppliers for system improvements. However, there is no state program that provides funding to map infrastructure. It is a very straightforward, simple program that allows the PWS to choose the vendor and the level of mapping detail desired, which helps them control the cost of the project.

14. *What were the program's startup costs?* The program was initially funded with \$150,000 for grant awards. The program's startup costs were separate from the grant funding and minimal as it required no additional staff, equipment or technology. One staff person was assigned to the program at approximately 0.5 FTE for one month (\$7,200) to develop the program description; application forms; and to develop the Microsoft Access database for record keeping. However, there were ancillary costs generated from the program startup that should be considered. Prior to implementing the program, Kansas did not have a GIS Water Utility Data Standard, which the program needed to provide guidance to PWS; we wanted to make sure the PWS had a usable dataset in addition to the map products. The same staff person was involved in the development of the data standard as a member of the Kansas GIS Policy Board's Technical Advisory Committee, at approximately 0.5 FTE for six weeks (\$10,080). The Committee worked through the revisions of the standard and a public comment period (a two month process) prior to its approval by the GIS Policy Board and the Kansas Information Technology Executive Council (Kansas Information Technology [Policy 6180](#) and [Policy 6180A](#)).

15. *What are the program's annual operational costs?* The amount of funding available for grants has varied in the last two fiscal years, averaging \$87,500 per year. It is KWO's intent to provide \$150,000 in grants annually when the budget allows. Operational costs for the program consist of approximately 0.1 FTE (\$18,720).

16. *How is the program funded?* The program is funded through the Kansas Clean Drinking Water Fee Fund, which collects a fee at the rate of \$.03 per 1,000 gallons of water sold at retail by a PWS system, in lieu of paying sales tax on purchases of tangible personal property and services by the PWS. At least 15% of the fund is directed to provide on-site technical assistance for PWS

systems, to aid in conforming to responsible management practices and complying with regulations of the United States Environmental Protection Agency and rules and regulations of the Kansas Department of Health and Environment.

17. *Did this program require the passage of legislation, executive order or regulations?* No.
18. *What equipment, technology and software are used to operate and administer the program?* A microcomputer and MS Office software are used.
19. *To the best of your knowledge, did this program originate in your state? If yes, please indicate the innovator's name, present address, telephone number and email address.* Yes. When enhanced funding for technical assistance to PWS became available in July 2007, Tina Rajala, KWO, and Elmer Ronnebaum, Kansas Rural Water Association (KRWA) collaborated on a new area of technical assistance that was not addressed in other State programs. KWO contracts with the KRWA for on-site technical assistance to PWS. KRWA's relationship with Kansas public water suppliers provides unique insight into the needs of the systems it serves.

Tina Rajala, Environmental Scientist
Kansas Water Office
901 S Kansas Ave, Topeka KS 66612
Ph: 785-296-0875
Email: Tina.Rajala@kwo.ks.gov

Elmer Ronnebaum, Manager
Kansas Rural Water Association
PO Box 226, Seneca KS 66538
Ph: 785-336-3760
Email: krwa@krwa.net

20. *Are you aware of similar programs in other states?* No.
21. *Has the program been fully implemented?* Yes.
22. *Briefly evaluate (pro and con) the program's effectiveness in addressing the defined problem or issue. Provide tangible examples.* To date 103 grants have been approved; 45 projects have been completed. The grant has been popular and all available funds have been committed. Figure 1 is a portion of a Marysville, Kansas infrastructure map; and is an example of the high quality of the maps produced. Data for all projects are backed up off-site and accessible for emergency use. A side benefit (because the grant requires it) is that 60 PWS now have a current water conservation plan which covers both long-term management practices and short-term drought/emergency measures that enhance the ability of the PWS to extend the viability of both the water source and the system infrastructure. On the negative side, there is more interest in the program than there is funding available; particularly from systems that are only slightly above the program's target group of 1,000 or fewer customer meters. We would like to address larger systems; however, there are more than 650 PWS in Kansas in the current target group. The grant has funded only 15% of the eligible PWS during its first three years.

Another concern is that although the Water Utility Data Standard recommends that utility data be collected using Global Positioning System (GPS) technology for accurately locating infrastructure, it acknowledges that other less-precise methods of data capture (such as digitizing over aerial photography or scanning paper maps) are an acceptable alternative. A few PWS chose not to use GPS technology in their project. Although those PWS feel that the lower quality data is adequate for their needs, the KWO believes that systems are much better served in the long run if the projects use GPS.

23. *How has the program grown and/or changed since its inception?* The program has not changed since inception.

24. *What limitations or obstacles might other states expect to encounter if they attempt to adopt this program?* The only significant obstacle that a state may encounter is a lack of a Water Utility Data Standard, which is needed to ensure that quality data is collected in a format that is widely recognized. At the time Kansas developed its standard there were a few draft standards underway, most notably in Arkansas and Massachusetts. However, like Kansas, those draft documents had been stalled for several years. In Kansas the GIS Policy Board struggled with the desire to develop a comprehensive water distribution data model, which is a robust framework for fully integrating GIS technology into the operations of a PWS system, and the reality that the data model is far too complicated for most of the PWS systems in Kansas. The development of the PWS Mapping Grant provided the impetus to develop the minimum requirements found in the Kansas standard. The comprehensive data model, which is suitable for the largest systems in Kansas, has not been developed as a standard; however, many of the largest PWS in Kansas are developing water distribution models that meet their needs.



Figure 1: Example of Infrastructure Map from City of Marysville, Kansas