



**Western Kentucky University
Technical Assistance Center for Water Quality
Center for Water Resource Studies**

**“Supporting Small Water Systems in
Meeting the Goal of Public Health Protection”**

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**Quarterly Report
for the period
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Introduction

The Technical Assistance Center for Water Quality at Western Kentucky University (TACWQ WKU) serves to support capacity development of small drinking water systems through the Utility Management Institute, a circuit rider, source water protection activities, and information technology. The goal of the center is to help small systems meet the requirements of the Safe Drinking Water Act (SDWA) and ensure public health. While focused on solving local problems that can serve as national models, the TACWQ is impacting small systems throughout the country.

Activities and Outcomes

Utility Management Institute

The Utility Management Institute (UMI) was created to provide utility managers, and other utility personnel, with the opportunity to gain valuable knowledge and earn a university-based, professional designation in the field of management. These goals can be accomplished through the successful completion of six modern, practical management courses, specifically developed for public water and wastewater utility personnel.

The UMI offers training to managers—and those interested in becoming managers—through a set of courses designed to be practical and applicable to water and wastewater utilities, regardless of size. Courses include Utility Management 101; Utility Organization, Regulation and Law; Utility Finance and Administration; Human Resource Management for Utilities; Public Relations in Utility Management; and Modern Technology and Utility Management.

During the quarter, the course entitled “Utility Finance and Administration” was presented in Pineville, Kentucky on April 25-26, 2006 at Pine Mountain State Resort Park. There were twenty-nine (29) students participating in this course. Course assessments continue to show a high level of satisfaction with the training. Ten (10) of the assessors rated the session as very beneficial, and twelve (12) rated the course as being beneficial. No student assessments rated the course as being “slightly beneficial” or “not beneficial.” An agenda and the course assessments are available upon request.

The Utility Management Institute now claims a total of two hundred forty-three (243) students. Ninety-four (94) of these students have now completed all six of the courses in the UMI Series and have been awarded the Utility Management Professional designation.

Small System Circuit Rider

The "Circuit Rider" approach to providing a combination of on-site technical assistance and training is nationally recognized as the most effective method of assisting small public water systems to comply with state and federal environmental regulations. The Circuit Rider program works in partnership with Kentucky Division of Water (DOW) to target the public water systems

serving populations under 3,300, with particular emphasis on systems serving less than 500 people. Our “Circuit Rider” approach works to target those small systems experiencing profound difficulties in complying with SDWA provisions in order to enhance protection of public health.

During the 3rd Quarter, the Circuit Rider position logged 530.5 hours. Of that time, 34% of the total time was spent directly assisting systems or their personnel including 128.5 hours on-site working with systems, 31.5 hours developing plans and reports for systems, and 32.5 hours providing formal training and program outreach.

The majority of time this quarter was spent assisting systems with Consumer Confidence Reports. Activities for technical assistance included GPS-GIS mapping, leak detection, wellhead protection and water resource evaluation. Compliance assistance included public notification, DBP monitoring plans and CCR preparation. Management and financial assistance included water accountability and cost of service education.

Significant Contacts:

Lovellaceville Water System – Located in Ballard County Kentucky; serves 75 water customers.

Lovellaceville is a very small agricultural community in western Kentucky served by groundwater. The system owner/operator Barbara McGowan contacted the Circuit Rider for assistance with the CCR and several violations. She stated that the system was within a few weeks of being referred to enforcement. The Circuit Rider contacted the Primacy Agency to request an extension since the system was seeking assistance. The extension was therefore granted. The deficiencies were: failure to monitor for Asbestos, TTHM, HAA-5 and Bacteriological; failure to submit a DBP monitoring plan; failure to submit the 2004 CCR; and failure to submit MORs. The Circuit Rider visited the system and determined that the source of these violations was caused by unfamiliarity with the regulations and revenue. While at the system the Circuit Rider reviewed the monitoring data and completed a CCR to cover 2004-2005 along with the required public notices, as well as create a DBP monitoring plan. In addition, the system needed an updated sample site monitoring plan and map. The circuit rider utilized GPS-GIS to accomplish this task. As of June 30, 2006 the system was on its way back to compliance. The only remaining task is to collect DBP samples in August, which has already been scheduled with the contract laboratory. The Circuit Rider was asked to revisit the possibility of increasing water rates towards the end of 2006.

System Savings: estimated \$2,500+ had the case gone to enforcement.

City of Lynch – Located in Harlan County Kentucky; serves 400 water customers.

The City of Lynch is a small mining community in eastern Kentucky. They operate a surface water treatment plant supplied by an abandoned coal mine and occasionally supplemented by a nearby stream. The Circuit Rider was asked to assist with the 2005 CCR. While at the water treatment plant the operator was explaining the troubles with the PLC read out for the continuous

turbidimeters that have never worked. The Circuit Rider was able to troubleshoot the system and found that the PLC was incorrectly wired to the signal output. After rewiring the four turbidimeters and re-programming the PLC the operator was able to utilize the monitoring equipment and not have to perform multiple turbidity tests throughout the day.

System Savings: \$7,500 for the cost of a technician out of Florida to service the equipment.

Linking Aquatic Ecosystem Metabolism to the Formation of Drinking Water Contaminants: Implications for River and Reservoir Management

A manuscript was submitted to KRWA's *Waterproof* in May 2006 on research and challenges associated with DBPs. A preliminary model of the DBP predictive management tool will be presented at the Water Quality Gordon Conference in New York in August. Data regarding the DBP precursor findings at Springfield Water Company will be presented at the ISEIS conference in Bowling Green, Kentucky in August.

Web-Based GIS

The Center for Water Resource Studies (CWRS) and Spatial Data Integrations (SDI) are developing a prototype system to determine the effectiveness of a web based GIS solution for small water utilities. The ability to host an entire GIS solution in one central location not only allows these utilities to share the cost involved in the creation of a GIS, it also reduces the amount of maintenance and manpower required by each individual utility. We believe that this new approach to GIS will prove to be a viable option for the small water systems in the U.S.

During the 3rd quarter, SDI completed the basic interface to the Web Based Mapping Application. This interface includes the following tools: Zoom In/Out, Pan, Map refresh, Measurement, Identification, Selection, Zoom to selected feature, Clear selection, Table of contents, Create new features, Create new contacts, Create new materials, Undo creation, View attribute tables, and Create bookmarks.

The next step in the Web Based Mapping project is to begin the integration of rural utilities data. Over the next quarter we expect to have 10 – 15 utilities of various sizes loaded into an ArcSDE relational database. This allows for the storing of all spatial data within a single location and ensures each utility has secure access to their data.

The most recent version of the Web Based Mapping application along with sample data can be found at <http://12.180.241.9/water>.

Small Systems Partnership for Compliance Monitoring

During the quarter, WATERS provided microbiological analytical services to eleven (11) public water systems in Kentucky with populations less than 10,000. Six (6) of these systems have populations less than 3,300.

Source Water Assessment Analytical Method Development

During the third quarter, WATERS Lab moved closer to certification for Cryptosporidium and Giardia testing under the LT2 Rule by addressing recommendations made after an on-site audit by EPA inspectors in February. After their site visit, EPA requested additional blank and spike data for Method 1623. Also, poor Giardia recovery from one set of spiked samples—attributed to a bad batch of Dynal immunomagnetic beads and acknowledged by the manufacturer—needed to be corrected in future data.

New suppliers for spikes, stains, and other reagents were used in attempts to improve Giardia recoveries. Live organisms from the Wisconsin State Laboratory of Hygiene, which provides quarterly performance testing samples to certified laboratories and those seeking certification, are now used. Once a sufficient number of blanks and spikes have been conducted, the data will be sent to EPA for review.

Procedures for Assessing Source Water Vulnerability to Suspended Sediment and Prioritizing Implementation of Best Management Practices in Karst Environments

The goal of this project is to develop procedures for small water systems in karst regions to:

- a) assess source water vulnerability to suspended sediment and sediment-associated contaminants, and
- b) prioritize the implementation of best management practices (BMPs) for reducing the load of suspended solids to source waters.

During the quarter, the USPED soil erosion model implementation for the Greenburg source area below Green River Lake was finalized. Analysis of model outputs by 14 digit hydrologic units was used to assess general patterns in risk of erosion and sediment loading. Subsequent analysis of sediment loading potential employed fixed-width riparian buffer zones of widths 50 -350 m in increments of 50 m. Net deposition in riparian zones is predicted, with a gradual transition to net erosion as buffer width increases. This transition occurs rapidly at locations having small drainage areas, and much more gradually in locations with large catchment areas and wide valleys. Overall, the analysis highlights several areas of relatively high erosion and sediment loading risk that may be targeted for best management practices. Preparation of a final report is ongoing and will be completed next quarter.

Source Water Protection Education and Outreach

A Decision Support System (DSS) web site which will consolidate drinking water information and tools from multiple locations to allow the user to go to one location when making a decision regarding their water supply is under development. The current beta site is available for view at <http://water.wku.edu/dss/index.htm>. Currently, GIS coverages included on the ArcIMS server are being cataloged, and searchable metadata is being developed. A Wiki is also being planned to allow water systems to interact with the DSS.

Laboratory Data Exchange System

Large volumes of laboratory data from different sources have made data exchange between different applications very difficult. This project involves the development of a software system that consists of a set of tools to facilitate data exchange. Small water utilities will benefit from this system by being able to share information easily with reporting agencies and move data from one information management tool to another without the time and expense of data conversion. This will facilitate the sharing and reporting of data for purposes such as tracking trends in water quality.

A new computer science graduate student was hired this quarter. This project is expected to be completed next quarter.

Web Page Hosting

Many small water systems do not have the financial or technical resources to develop and host their own websites. A template has been developed that allows small water systems to customize a site with pertinent information, such as CCRs, business hours, fee schedules, and contact information. This quarter, web pages were modified to allow the small utilities to modify the special information included on their site. This special modification feature is password protected with unique passwords for each water district. Hosting sites are available to preview from: <http://water.wku.edu/hosting.htm>

Letters are being developed to mail in the coming quarter to additional small water systems that may be interested in having an individual website created and hosted for their system.

Technology Training

As the use of technology develops, the need for technology training increases. A workshop for water districts is currently being planned to help demystify the technology tools available to them. Some of the tools to be covered include items developed by CWRS, USGS, EPA and SDI. CDs with these tools will be made available to participants. Basic computer information including backup, security and GIS will also be covered during the training.

Center Coordination

The CWRS hosted guest speaker Alena Bartosova from Illinois State Water Survey on May 12, 2006. Jana Fattic attended the KY Division of Water (DOW) Watershed Steering Committee meeting in Frankfort, KY on April 27, 2006.

Karla Andrew attended the American Water Resources Association (AWRA) GIS specialty conference in Houston, Texas on May 8-10, 2006, and gave two presentations on her work. Ms. Andrew also attended the AWWA annual conference in San Antonio, Texas on June 11-15, where she assisted with the TACNet booth. Alanna Storey attended the annual KRWA Operator's Expo in Bardstown, KY on May 24-25, 2006, where she gave a presentation to system operators on proper sample collection and transportation techniques. The operators obtained continuing education credit for the training.