Protecting Ohio's Drinking Water Sources

Ohio EPA
Division of Drinking and Ground Waters

Drinking Water Source Protection Update

November 2007

Success Stories: Ohio Communities Implement Source Water Protection

Ohio EPA's Source Water Protection Program recently asked community public water system operators to report their "greatest successes" in implementing source water protection. Here are some of their replies.

Removed Potential Contaminant Sources

- **Muskingum County Water** and the **City of Wooster** reported abandoned and/or leaking underground fuel storage tanks had been removed from their protection areas.

- The **City of North Canton** reported staff members discovered 45 open drums containing various solvents lying on their sides in a grassy area within 1,000 yards of a city production well. The staff contacted the company responsible for the drums and explained why they were a threat to the city's public drinking water. The drums were quickly cleaned up. City staff now drive past this site at least monthly and report that it has remained clean.

Local Collaboration

- The **City of Findlay**, which draws water from the Blanchard River, has teamed up with the Blanchard River Watershed Group to restore and protect the river.

- The **City of Loveland**, a ground water system, has also developed active partnerships with local conservation groups.

Local Ordinances

For some municipalities, source water protection is implemented using a local ordinance.

- The cities of **Cincinnati, Fairfield and Hamilton** have effectively maintained coordinated overlay ordinances for over a decade, in an area of complex overlapping protection areas and jurisdictions.

- The **Village of Ontario** listed as its greatest success the passage of a source water protection ordinance, providing a mechanism to protect its source water from activities related to rapid development occurring near the wellfield.

Ownership of Protection Area

- The **Village of Minster** and the **City of Springfield** both cited as their greatest success the fact they own all or most of the land within their protection areas. Municipal ownership of the land in a protection area is one of the best ways to protect it, and numerous other communities are purchasing the land around their wellfields as it becomes available.

Implemented SWAP Contingency Plan

- **Hecla Water Association**'s source water contingency plan was tested for the first time in the Spring of 2004.

Highlights

On March 29, a concrete truck's tire blew out and the truck veered off State Route 7, near Hecla's production wells. The fuel tank ruptured and an estimated 20 to 50 gallons of diesel fuel spilled onto the ground.

Hecla Water report it was very pleased with how the first responders contained the spill. They notified Hecla Water and stayed on site until the contaminated soil was removed. All of the first responders knew this accident occurred in the wellhead protection zone and understood how important it was to make sure the area was cleaned up properly.

Education and Outreach

The majority of respondents listed educational efforts and increased awareness as the main success.

- **Brown County Regional Water Association** has held a source water protection meeting every quarter for the past eight years, and reports the meetings continue to be well attended by representatives from local government, other utilities, educators, citizens and retirees.

- The **City of Columbus** wrote: "The program is active and present in the minds and actions of the residents within the [Source Water Protection Area]. Most have bought into the concept and many incidents of contamination are actually brought to our attention by residents themselves."

When it rains it pours
Tiffin's Experience

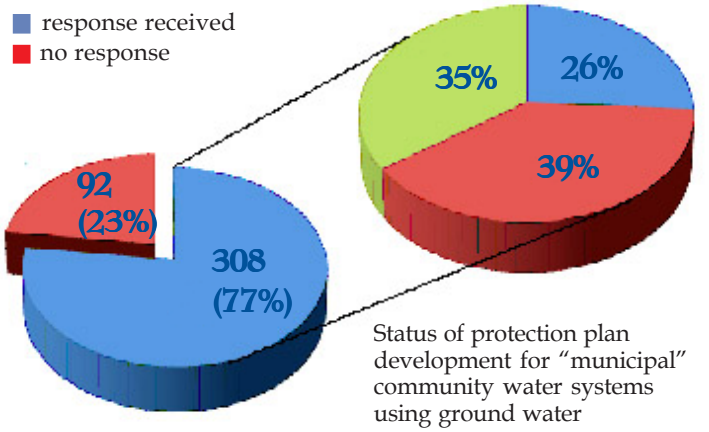
Relatively clean source water is often taken for granted. Ohio-American Water Company in Tiffin, which supplies surface water from the Sandusky River, had to deal with two major emergencies within a few years. First, 5 million of the 25 million tires at the Kirby Tire Dump went up in flames in 1999, sending toxic oily runoff into a Sandusky River tributary (see photo) upriver from the Tiffin intake. This was followed by the collapse of an ammonia tank 20 miles away that spilled 1.5 million gallons of ammonia into the Sandusky River, also threatening Ohio-American's intake on the river. Ohio-American worked closely with Ohio EPA to help clean up the spills and test the water. Treating the ammonia-contaminated surface water was a strenuous and expensive two-step process. Throughout both incidents, the company continued to provide its customers with safe drinking water. While Tiffin's source water protection activities alone could not have prevented these disasters, being prepared to coordinate a response to such emergencies undoubtedly contributed to the company's success.

Source Water Protection Implementation Survey

In March 2007, Source Water Protection (SWAP) Program staff at Ohio EPA's district offices sent out "SWAP Surveys" to the operators of community public water systems operated by a municipality or private water company. The main goal was to obtain a "snapshot" of the status of source water protection planning and implementation in Ohio.

By late August, 424 of the 549 questionnaires had been returned (77 percent). About 26 percent of the ground water systems have an endorsed plan. None of the surface water systems have an endorsed protection plan yet, but 20 of them said they are already partially implementing protective strategies. Overall, 35 percent of the survey respondents report that they have started to develop a protection plan (see graph).

Survey response rate for "municipal" community water systems using ground water



Status of protection plan development for "municipal" community water systems using ground water

- Have an Endorsed Protection Plan
- Have NOT Started Developing a Protection Plan
- Have Started Developing a Protection Plan

Other results

- About 71 percent have plans in place for loss of water source.
- About 44 percent plan for spills within the protection area (36 percent of ground water systems and 51 percent of surface water systems).
- About 21 percent report commercial, industrial and municipal facilities within the protection area employ appropriate best management practices.
- About 13 percent provide educational material to septic system owners.
- About six percent report all or part of their protection areas are enrolled in the U.S. Department of Agriculture's Conservation Reserve Program, which pays growers to stop cultivating portions of their property (usually within a sensitive natural resource area).

Educational Strategies

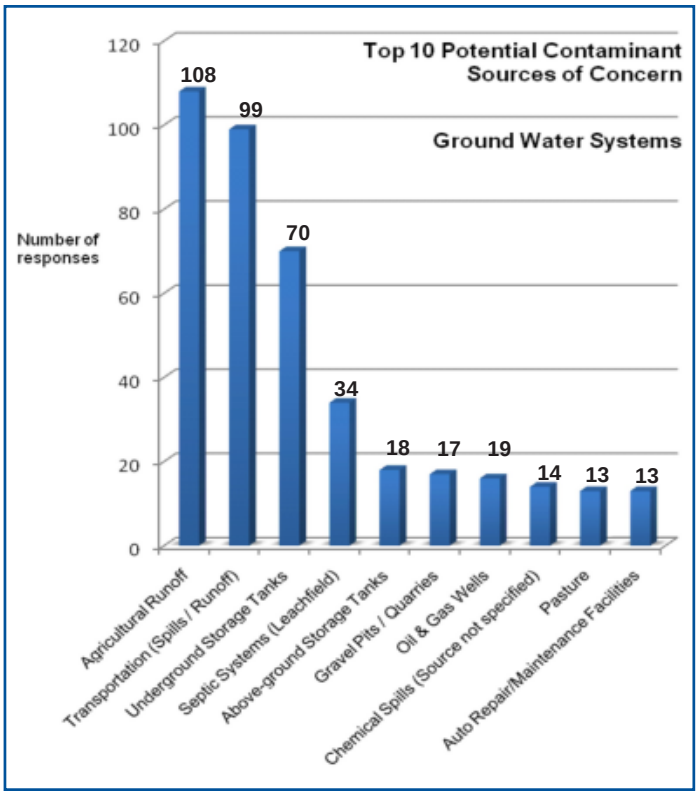
Respondents indicated 41 percent of the systems provide tours of the plant, and 18 percent place signs along highways crossing their protection areas, notifying motorists they are driving through a source water protection area. So far, only five percent are using local Source Water Environmental Education Teams (SWEETs) to help educate the community about source water protection.

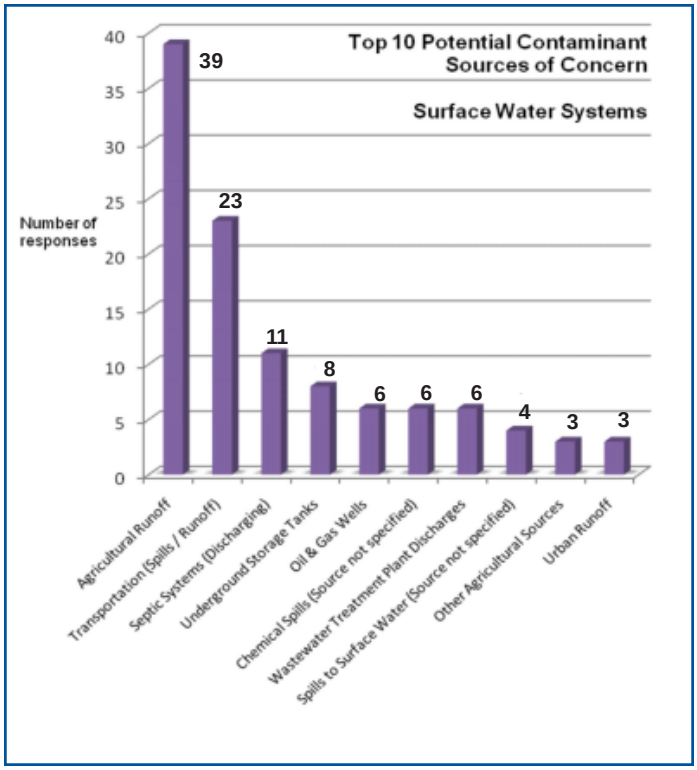
Funding

About seven percent said they applied for funding to plan or implement source water protection; the majority applied for Section 319 Clean Water Act grants. The main barriers to protection planning appear to be lack of available funding and lack of personnel (40 percent of respondents claimed both of these). Lack of community involvement was also a factor (27 percent). Other possible barriers cited were: lack of technical assistance (17 percent), lack of information (15 percent) and local politics (17 percent).

Genuine Threats

The respondents were also asked to list which potential contaminant sources within their protection areas they considered to be "genuine threats" to their water quality (see graphs). For both ground water and surface water systems, agricultural chemicals were listed as the greatest threat, followed by transportation. This is probably because most of Ohio's source water protection areas are located in agricultural areas and are crossed by major roads and railroads. For ground water systems, underground storage tanks and septic systems ranked third and fourth on the list; for surface water systems the order was reversed. Other types of activities cited as primary threats varied widely between ground water and surface water systems.





More Protection Plans Endorsed in 2007

Ohio EPA congratulates the following systems, whose local Source Water Protection Plans were endorsed by Ohio EPA in State Fiscal Year 2007.

- Ross County Water Company
- Village of Waynesville
- Jefferson Township Water and Sewer District
- Greene County Southwest Regional Water System
- City of Wapakoneta
- Tuppers Plains-Chester Water District
- Village of West Jefferson
- Village of Shadyside
- Village of Racine
- Village of Malta

Together, these systems provide water to approximately 91,000 Ohioans. Throughout Ohio, 77 systems serving 3.1 million residents now have endorsed source water protection plans.

Fairfield County Systems Complete Innovative Protection Plan

The first county-wide regional protection plan in Ohio resulted in the endorsement of all participating systems on August 15, 2007. The two-year effort was led by Fairfield County Utilities and was funded in part with a $51,000 grant from Ohio EPA.

Ten public water suppliers worked with local, county and regional organizations to complete protection plans containing regional elements (such as a county-wide emergency response plan) and local plan components. The participating water systems were: Fairfield County Utilities, the City of Pickerington, Greenfield Township Water and Sewer District, and the villages of Amanda, Baltimore, Bremen, Millersport, Pleasantville, Lithopolis and Sugar Grove. These systems provide water to almost 39,000 Ohioans.

SWAP Technical Assistance and Outreach

Ohio EPA district office SWAP staff continue to assess new public water systems as they come online, unless the systems opt to do it themselves. From July 2006 to July 2007, 85 source water assessment reports were completed. Of these, only five were for community systems; the majority were for transient systems pumping small amounts of water. SWAP's primary focus has now shifted to helping public water systems plan for effective source water protection, and includes the following types of activities.

Local Protection Planning

In 2006, five public water systems in Jefferson County, assisted by Ohio EPA staff from the southeast district office, began meeting regularly to jointly develop their source water protection plans. In 2007, southwest district office staff initiated a similar multi-session joint planning effort in Logan County. Upon submission of an endorsable protection plan, participants can earn up to five contact hours toward their water certification education requirement.

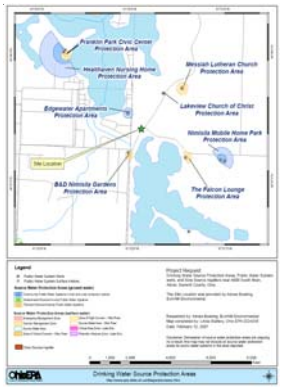
The Division of Surface Water and the Division of Drinking and Ground Waters teamed up in February 2007 to conduct a series of Source Water Protection Workshops in Trumbull County, where the majority of water systems are surface water suppliers that collectively serve over 54,000 people. Besides helping suppliers develop an endorsable plan, these workshops encourage networking, communication and partnership building that will facilitate long-term implementation of the plan.

Additionally, district staff logged 107 individual meetings over the past year with public water system operators or local source water protection teams.

SWAP Secure Web Page

On August 25, 2006, a secure Web page went online that enables users to view the SWAP assessment reports by logging in with a user name and password. By June 30, 2007, there were 218 registered users, most of them environmental consultants. Other users include representatives of state, local and federal agencies, regulated communities, schools and non-profit organizations from 13 states and the District of Columbia. To register, go to *www.epa.state.oh.us/ddagw/Documents/swap_register.pdf.*

Site-Specific Maps



During the last year, SWAP staff at Ohio EPA's central office responded via e-mail to 586 requests for site-specific maps showing locations of source water protection areas near regulated facilities—an increase of 37 percent over last year. Average response time was less than two days. The majority of these requests came from environmental consultants conducting site assessments of former gas stations. Also, central office staff responded to 136 requests for maps showing locations of source water protection areas near proposed mining sites.

Site-Specific Posters

The SWAP program continues to create poster-sized maps of individual source water protection areas for public water systems that are actively engaged in source water protection (see illustration shown at right). Due to the cost of these posters, the program cannot produce multiple copies, but it can make the map available electronically to the community (via CD or Internet), and the community can then arrange for printing at the desired sizes and numbers.

Source Water Environmental Education Teams (SWEETs)

In October 2006, five regional workshops were conducted in support of the "Project SWEET" partnership with the Ohio Department of Natural Resources – Division of Soil and Water Conservation. Initiated in January 2005, Project SWEET created more than 40 county/regional Source Water Environmental Education Teams to provide education in ground water concepts and source water protection. As of July 2007, the teams had conducted 182 outreach events to more than 18,000 Ohioans through a variety of venues, including community programs, civic meetings, local festivals and school programs. SWAP staff at the central office maintain the SWEET Web page, accessible at *www.epa.state.oh.us/ddagw/SWEET/.* We encourage water system officials to collaborate with the local SWEETs.

Sensitive Karst Aquifer in Clark County Identified

In early 2007, Ohio EPA conducted two studies to determine the extent of karst development in a region of Clark County where some limited data suggested the attributes of a karst aquifer. Source water protection is especially important in such settings, because water flows very quickly through karst areas and any contaminants on the land surface can quickly enter the ground water and be drawn into drinking water wells.

With the help of several local land owners, Ohio EPA identified numerous karst features, such as sinkholes and caves, in the area. In the first study, conducted after a rainy period in February 2007, fluorescein dye was injected in a sinkhole and was detected 45 minutes later in a spring located 900 feet away. This indicated a ground water flow rate of 28,800 feet per day, one of the fastest ever recorded in Ohio!

In the second study, conducted in April 2007, dye was injected in another sinkhole and was detected at three springs and in two private wells. It had not rained for five days before this study, so flow rates were less than the previous study (averaging about 3,100 feet per day) but still much faster than flow rates in non-karst aquifers. This high ground water flow rate is indicative of a well-developed karst region highly susceptible to contamination. During 2008, the SWAP program will re-delineate protection areas for the public water systems located in this region to more accurately depict the recharge zone for the wells.

What's New …

Inland Lakes Monitoring

Ohio EPA Evaluating Lakes That Provide Drinking Water

Ohio EPA's Division of Surface Water has been evaluating the water quality of Ohio's rivers for decades, using chemical and biological indicators to identify impaired water quality. However, lakes have not been consistently monitored since the mid-1990s when the Clean Lakes Program lost federal funding. In 2006, Ohio EPA and ODNR's Division of Wildlife teamed up to develop a monitoring plan for Ohio's lakes. The lakes that provide drinking water to public water systems will be sampled first.

Impaired lakes will undergo a Total Maximum Daily Load (TMDL) analysis, where Ohio EPA staff identify the causes of the impairment and propose activities to restore water quality. For more information, visit *www.epa.state.oh.us/dsw/inland_lakes/.*

Notification of Raw Sewage Releases

Public surface water systems located within 10 miles downstream of major wastewater treatment systems can now expect to be notified when untreated sewage or other unexpected spills or wastewater discharges into the stream (see box below). In 2007, Ohio EPA started including instructions in wastewater discharge permits that direct the operator to contact any public water systems within ten miles downstream of the discharge outlet when such releases occur. When a permit including the notification requirement is issued, the SWAP Program informs the affected public water systems that the wastewater treatment operator should contact them soon to arrange timely notification procedures.

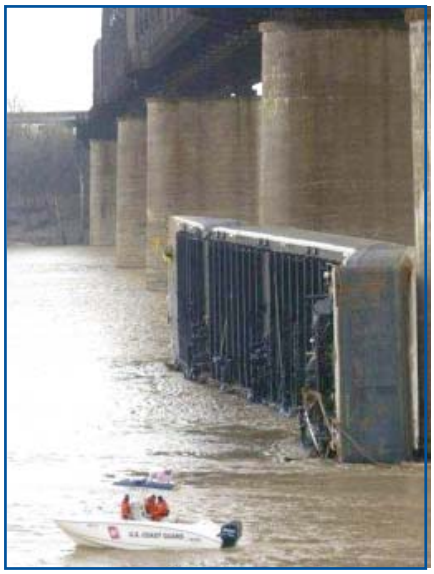
Types of Raw Sewage Releases

Combined Sewer Overflows (CSOs) -
Many of Ohio's older cities have combined sewer lines that carry both sewage and storm water. During storms, the volume of water in combined sewers may become too great for wastewater plants to treat, so the excess is released untreated to a stream. Such discharges can introduce high loads of bacteria, viruses and household chemicals into the stream. In January 2005, Ohio had about 1,400 known CSOs in 87 communities. These communities are gradually replacing their combined systems with separate storm water and wastewater lines.

Sanitary Sewer Overflows (SSOs) -
SSOs are releases of untreated sewage resulting from accidents such as a line break or a blockage that causes sewage to back up and discharge into a building or other outlet.

Protection Plan Template for Ohio River Systems

Public water systems treating water from the Ohio River will soon be able to develop their source water protection plan from a template designed specifically for Ohio River systems. The City of Cincinnati and the Ohio River Sanitation Commission (ORSANCO) are working with Ohio EPA's SWAP program to develop a source water protection plan template that addresses the river's unique issues and incorporates ORSANCO's early warning, emergency response, water quality monitoring and educational activities. Ohio EPA will notify the public water systems on the Ohio side of the river when the template is available, probably in mid-2008.



New Rules on Land Application of Treated Sewage in SWAP Areas

On July 1, 2007, new rules covering the land application of treated sewage came into effect. These rules regulate the siting and operation of systems designed to reuse or recycle treated sewage in a manner that minimizes discharges to Ohio's streams, rivers and lakes. These systems treat sewage and usually use spray-irrigation to apply all or a portion of the waste-water to sites such as golf courses, recreational fields or farmland. These rules include provisions designed to protect drinking water sources through siting criteria for storage facilities and land application areas, and use the susceptibility of the public water system to help factor environmental risk into siting.

Miami Conservancy District Offers Source Water Protection Grants

This summer the Miami Conservancy District (MCD) announced a new source water protection grant available to communities within the district's Aquifer Preservation Subdistrict, which covers all of Shelby, Miami, Clark, Montgomery and Preble counties, and portions of Greene, Warren and Butler counties. A total of $200,000 was made available for funding projects that develop or implement source water protection plans. The majority of these funds are targeted to communities implementing projects that are outlined in their previously completed and Ohio EPA-endorsed Source Water Protection Plan, Comprehensive Plan, or Ohio Department of Natural Resources-endorsed Watershed Action Plan. All awards require a minimum 25 percent local match and projects must be completed within two years. MCD intends to offer another round of awards at the beginning of 2008. More information is available at *www.miamiconservancy.org/water/source_water_grant.asp.*