



A NEW INFORMATION SHARING PLATFORM FOR SOURCE WATER PROTECTION

PENNSYLVANIA'S EARLY WARNING SYSTEMS

BACKGROUND

In response to the 1996 Amendments to the Safe Drinking Water Act (SDWA), which increased the Act's focus on pollution prevention and required states to complete source water assessments, the Pennsylvania Department of Environmental Protection (PA DEP) and several large city community water systems collectively identified contaminant spills and rapidly declining water quality as their chief source of water protection concerns.

The watershed areas above many of these drinking water system intakes are thousands, if not tens of thousands, of square miles, leaving systems prone to a wide array of potential point & non-point sources of contamination from across the watershed, whether from regulated direct discharges or the more disparate influences of land management practices and land cover change. Further complicating the matter, several of Pennsylvania's major source intakes are "run of the river" systems that draw water directly from a river for treatment and distribution. Unlike systems that draw from lakes or reservoirs and benefit from these waterbodies' natural tendency to dilute periodic water quality changes and delay the effects of emergency situations, such as contaminant spills, these intakes are left exposed to the more volatile conditions of a river channel. To protect these sources more adequately, Pennsylvania DEP, in coordination with neighboring states, promoted and supported development of Early Warning Systems (EWS) on its major rivers as a critical element of a comprehensive source water protection strategy.

WHAT ARE EARLY WARNING SYSTEMS?

Early Warning Systems (EWS) are spill or contamination warning networks that provide information to drinking water utility operators, first responders, and the public to enhance their ability to detect and respond to water quality changes. An EWS often consists of a network of real-time monitoring practices and alerts and complementary response and communications procedures. EWSs play an integral role in protecting water supplies and provide a range of benefits to water systems and to other water resource uses. For example, EWSs can:

- Provide advanced notification to drinking water treatment plants and other partners in the event of water quality changes or contamination;
- Observe long-term trends to establish baseline ambient concentrations of substances in the source environment to prepare for future challenges;
- Inform people recreating on or around waterbodies about the water quality in their area; and
- Notify drinking water consumers about the quality and source of their drinking water.

ESTABLISHING AN EARLY WARNING SYSTEM: CASE EXAMPLES FROM PENNSYLVANIA

EWSs should be watershed-specific and tailored to meet the unique needs of the community water systems drawing water from its rivers. It is critical that the community water systems form a partnership to identify these needs, recognize the needs of all watershed stakeholders, establish robust communication networks among members, and regularly evaluate changes to the system. Protection networks are often represented by a collation of community water systems or a collaboration among state and federal agencies, such as a river basin commission.

EWSs are designed to measure various water quality parameters in source water or watersheds. The parameters chosen for monitoring reflect the characteristics of the watershed, results of source water and/or risk assessments, and the treatment and technical capabilities of the water system. When developing an EWS, it is critical to assess the current conditions, intended uses, and contaminant effects of the watershed. Contaminant sources to consider may include significant industrial uses, mining activity (whether abandoned or active), agriculture, railroads, highways, barge traffic, combined sewer overflows/storm water overflows, and oil and gas development. Whatever the challenges may be, EWSs allow water systems and their communities to proactively address and help solve water quality concerns.

The EWSs in Pennsylvania were patterned after the Organic Detection System established by the Ohio River Sanitation Commission (ORSANCO) in the 1980s and still in operation today. This system relies on a network of community water systems with intakes on the Ohio River that house, operate, and communicate results of real time organic detectors (gas chromatographs). While a valuable tool for its time, the Organic Detection System was implemented prior to the Pennsylvania Department of Environmental Protection Source Water Protection program and, therefore, wasn't designed to meet the goals set forth under the Safe Drinking Water Act 1996 Amendments for source water protection. Nevertheless, building off this effort, EWS networks were developed across the state and neighboring states to include community water systems on the Monongahela, Allegheny, Delaware, Schuylkill, Susquehanna and Potomac Rivers.

Ongoing evaluation of activities within the watershed remain critical to the effectiveness and success of an EWS. For example, concern of accidental releases and spills have grown in recent years since the introduction of unconventional oil and gas development to Pennsylvania's watersheds. EWSs have responded by updating monitoring stations for oil and gas-specific contaminants or partnering with organizations and agencies to develop remote water quality monitoring stations in selected sub-watersheds to identify releases or spills.

IMPORTANT CONSIDERATIONS FOR AN EARLY WARNING SYSTEM:

Use Data to Optimize Protections: Over time, a considerable amount of monitoring data is obtained within an EWS network that can be utilized to track long-term water quality trends, unique event characteristics, and contaminant hot spots or sources. A regular analysis of the available data and identification of present or long term trends should be considered by the EWS organization members for improvements and operations of the network.

Establish Partnerships to Sustain Operations: An EWS should be formally established and managed in an organizational structure that can operate, maintain, and enhance all aspects of the EWS. In Pennsylvania, several EWSs have been established through incorporation while others have been adopted by existing organizations. The State of Pennsylvania provided integral resources through the State Revolving Fund set aside to seed the capital investment (monitoring equipment, computer networks, etc.) to develop and launch the State's EWSs. However, ongoing system support, maintenance and upgrades should be self-supported by the community water suppliers and their partners.

PUBLIC INVOLVEMENT

All EWSs established under the PA Source Water Protection Program recognize public involvement as an integral component of a comprehensive system and have designed their outreach programs to meet the unique characteristics of their watershed stakeholders. Many EWSs have developed robust public education programs with detailed public websites. A few even provide access to data from monitoring locations. The Philly River Cast, for example, uses the results of a predictive model of expected coliform counts to provide daily estimates of the suitability of the Schuylkill River for water activities. The Delaware and Schuylkill River EWS (DelVal) has several public facing websites.

For more information about Pennsylvania's EWSs, please follow the below links or reach out to the listed contact.

The DelVal EWS (Schuylkill & Delaware Rivers)

There is a [fact sheet](#) on the [Schuylkill Action Network \(SAN\) website](#)

Contact: Kelly Anderson of the Philadelphia Water Dept. 215-685-6245; kelly.anderson@phila.gov

PhillyRiverCast (Schuylkill River)

<http://www.phillyrivercast.org>

SRBC EWS (Susquehanna River)

<http://www.srbc.net/drinkingwater/index.htm>

Contact: Jamie Shallenberger, Manager for Monitoring & Protection Program, Susquehanna River Basin Commission, 717-238-0423 x 1115, jshallenberger@srbc.net

River Alert Information Network (RAIN) (Allegheny & Monongahela Rivers)

<http://www.rainmatters.org>

Contact: Bryce Aaronson, Program Manager/Coordinator, bryce.rainmatters@gmail.com

Potomac Drinking Water Source Protection Partnership (Potomac River)

<http://www.potomacdwspp.org>

Contact: Carlton Haywood, Exec. Director chaywood@icprb.org; 301-274-8105



Visit www.sourcewatercollaborative.org/learning_exchange for more information about the Source Water Collaborative's Learning Exchange.