

SRBC's State of the Art Remote Water Quality Monitoring Program: Part Four – Providing Real-Time Water Quality Data

This column is presented weekly by the Public Education sub-committee of the Clinton County Natural Gas Task Force in an effort to provide accurate, up-to-date information on activities surrounding the Marcellus Shale formation and the natural gas exploration industry. For more information on Task Force activities, visit the Task Force page on the Clinton County government website at www.clintoncountypa.com.

This represents the fourth and final in a series of articles from the Susquehanna River Basin Commission covering its role as it relates to the natural gas industry.

This article continues the focus on the Susquehanna River Basin Commission's (SRBC) activities related to natural gas well development in the Marcellus Shale. Unlike the prior three articles that featured SRBC's regulatory functions, this one is about SRBC's Remote Water Quality Monitoring Program (RWQMN), which SRBC initiated in late 2009 to provide data for water management agencies to determine whether or not natural gas drilling activities are impacting water quality in the Susquehanna River Basin.

SRBC's RWQMN continuously measures and reports water quality conditions of smaller rivers and streams located in northern tier Pennsylvania and southern tier New York. SRBC receives the data from the stations and makes that real-time information available to resource agencies and the public via its web site at www.srbc.net/programs/remotenetwork.htm. The data help agency officials track existing water quality conditions and any changes in them on an ongoing, real-time basis. It essentially provides early warnings to help environmental protection officials respond more rapidly and better pinpoint causes if water quality conditions change.

The stations are operating in areas where drilling in the Marcellus shale is most active, as well as other locations where no drilling activities are planned so SRBC can collect control-data.

To date, SRBC has installed 37 water quality monitoring stations and is partnering with the Commonwealth of Pennsylvania for another 10 stations to be installed on public forest lands this spring.



SRBC will be announcing the selected sites shortly; several will be located on forest lands in and around Clinton County.

SRBC selects monitoring sites based on various criteria, including: (1) where drilling is currently active; (2) watersheds that match criteria such as stream size, stream flows, etc; and (3) factors that indicate where companies will likely target for future drilling such as natural gas infrastructure like pipelines and leases being in place. SRBC also selects some locations specifically for their pristine qualities such as those designated as High Quality or Exceptional Value Streams.

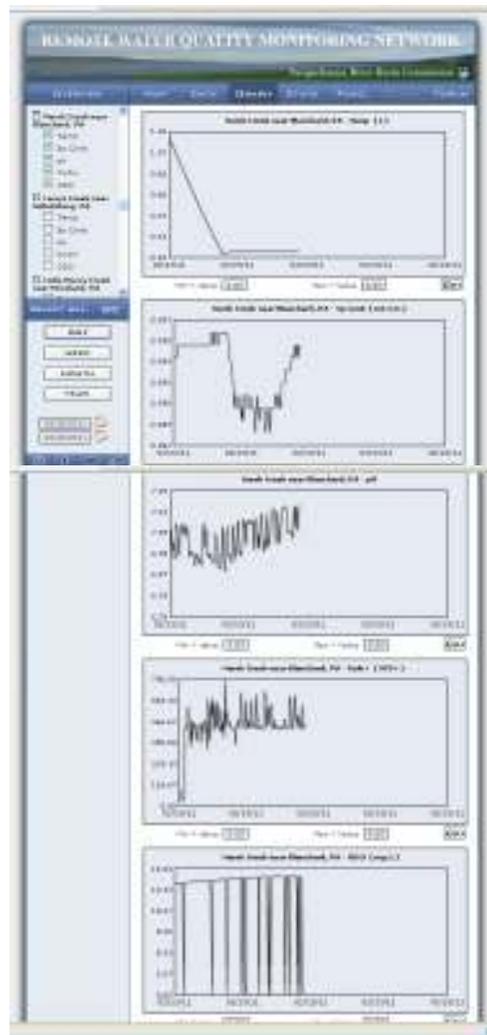
The monitoring network provides constant data measurement with instruments sensitive enough to detect subtle changes in water quality on a frequency that will allow background conditions and any changes to them to be documented throughout the year.

The following five water quality parameters are being measured at each station (graph shows five parameters for Marsh Creek near Blanchard, Pa.):

- **Temperature;**
- **pH** – the measure of acidity or alkalinity, with normal ranges between 6 and 9;
- **Conductance** – the ability of the water to conduct electricity, which typically reflects the amount of dissolved solids or chlorides in the water;
- **Dissolved oxygen** – amount of oxygen in the water available to aquatic life, with levels best above 4-5 milligrams per liter; and
- **Turbidity** – water clarity, or the amount of particulate matter in the water column.

A \$750,000 contribution from East Resources in 2009 provided the initial funding for the project. Then in 2010, the New York State Energy Research and Development Authority provided \$200,000 for SRBC to expand the network into the New York portion of the basin. SRBC is covering the ongoing maintenance costs.

When SRBC launched its RWQMN in late 2009, SRBC Executive Director Paul Swartz said, “The Commission clearly understands that citizens are concerned about natural gas drilling activities occurring in the Susquehanna basin. Data collection efforts such as this monitoring network are critically important to establish existing background conditions and monitor changes in water quality.”



SRBC's overarching objective of this monitoring network is to apply good science in order to track changes in water quality conditions over time and to allow for timely responses in the case of pollution events. Other objectives are to reduce the cost of data collection by using advanced technologies, enhance water supply protection through source water monitoring and be responsive to public concerns.

Frequently Asked Questions

What does a RWQMN station look like?

Each station consists of a: (1) data sonde (photo 1) that gets put into a protective PVC pipe (photo 2) and placed into the stream to measure data on the five parameters; and (2) solar powered, data platform (photos 3 and 4) that transmits the real-time information to SRBC.



How much does each monitoring station cost?

It costs about \$20,000 to purchase and install the equipment, and about \$4,000 annually to maintain the station, including labor, contingencies and data management.



At what interval are the data measured?

The water quality parameters are measured at 5-minute intervals and the data are transmitted to the SRBC office in Harrisburg every 2-4 hours. During the winter season, data transmission schedules to the web site may be reduced for select stations to conserve power, since the stations are powered by solar panels, which can be affected by snow/ice conditions and shorter daylight hours. In addition, water quality observations may be affected at times by ice build-up and/or blockages.



Does SRBC monitor the water quality data coming into the office?

Yes, SRBC staff members monitor the continuous monitoring data. In addition, alarms are set for each parameter at each station to alert SRBC staff of any deviations from normal levels.

Does SRBC collect additional data during station visits?

Yes. At select stations, SRBC also collects:

- streamflow measurements;
- macroinvertebrate (bugs) and habitat data;
- about six times a year, Acidity/Alkalinity, Chloride, Barium, Total Dissolved Solids, Sulfate, and Total Organic Carbon; and



- about four times a year, Calcium, Magnesium, Sodium, Potassium, Nitrate, Carbonate Alkalinity, Bicarbonate Alkalinity, Carbon Dioxide, Bromide, Strontium, Lithium, and Gross Alpha and Beta.

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