Geochemical Assessment of South Renovo Borough Water System

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ABSTRACT

The Hall Run and its tributaries are an integral part of South Renovo Borough Water System (SRBWS) that provides drinking water to approximately 540 people in Clinton County. It draws an average demand of 70,000 gallons per day directly from a reservoir and, during times of low-flow conditions, uses a well to supplement the drinking water supply system. The entire Hall Run watershed serves as the recharge area for this public water supply system, and therefore, contamination in any part of the basin could compromise the borough's drinking water system. In view of all of the Marcellus activity occurring just across the watershed's boundary, it is timely to establish a baseline dataset for water quality in the SRWBC.

The importance of pre-drilling, water-quality stream monitoring is magnified as drilling activity throughout the county increases dramatically. Shallow gas wells are present within the watershed boundaries, and there are three Marcellus drilling sites along nearby Mill Run Road and considerable truck traffic on Pete's Run Road and Route 144 that runs through the watershed. Currently, several Marcellus Shale gas-well drilling companies are carrying out seismic exploration in the Hall Run watershed. Any detected changes to water quality in the future would likely indicate the impacts of Marcellus drilling activity in the immediate region.

Along with assessing visual conditions of the streams within the Hall Run watershed, team members collected the following field data: temperature, pH, total dissolved solids (TDS), conductance, oxidation-reduction potential (ORP), dissolved oxygen (DO), and flow rate. These standard field parameters provided the basic framework for characterizing the quality of the various tributaries feeding Hall Run. Laboratory testing yields additional data on total suspended solids (TSS), aluminum, arsenic, barium, bromide, calcium, chloride, copper, total iron, total organic content (TOC), lead, magnesium, manganese, nitrate, phosphate, sodium, and sulfate data. In addition, a Hydrolab Sonde (MS5) was deployed for a week to collect continuous data on temperature, DO, conductance, TDS, pH, ORP, and chlorophyll-a.

For each round of water sampling, the concentrations of these variables provided a snapshot of the watershed's water quality. Over several sampling cycles, these data not only characterized the health of the ecosystem but also served to establish a trend in a baseline data set. Based on the field and lab analyses, we concluded that the water quality in the Hall Run Watershed met drinking water standards.

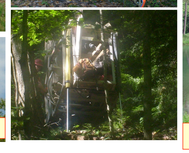
A PARTNERSHIP TAKES SHAPE

Initial planning meeting among the cooperating groups took place on May 17, 2011. The Manager of South Renovo Borough Water System, Gerry lacy, and two members of Lock Haven University's Geology Program discussed various aspects of Hall Run Watershed and made a plan to monitor water quality.

Deploying the Sonde

Sampling in the watershed

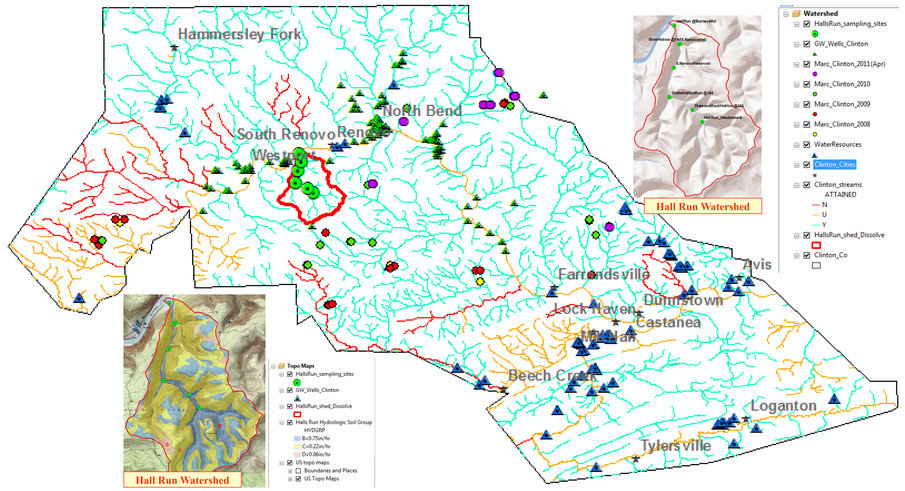
Shallow gas well



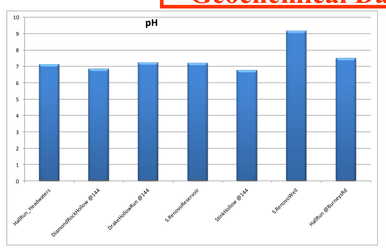
Seismic Exploration

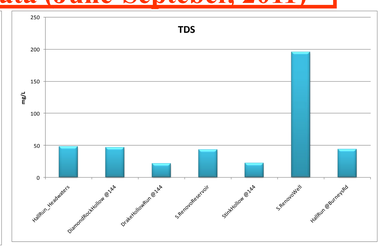
South Renovo Reservoir

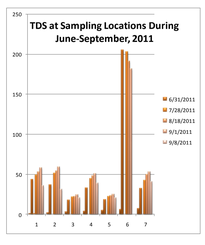
HALL RUN WATERSHED IN CLINTON COUNTY, PA

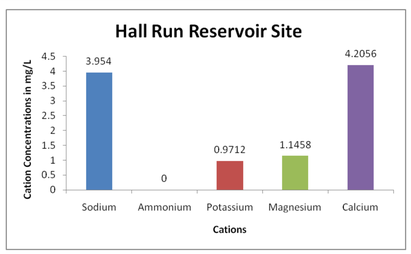


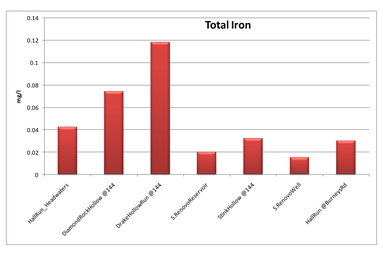
Geochemical Data (June-Septeber, 2011)

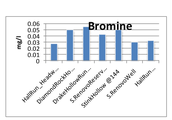


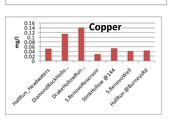


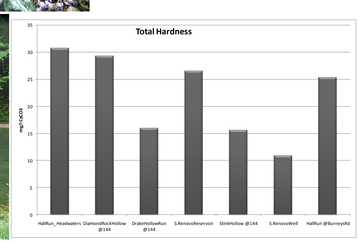


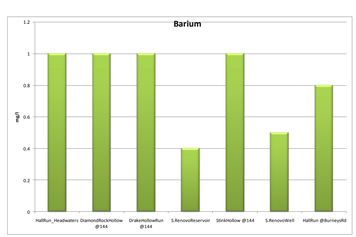


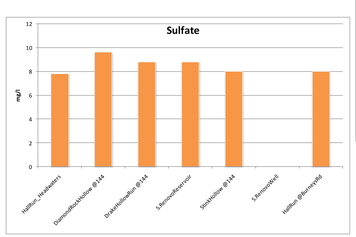




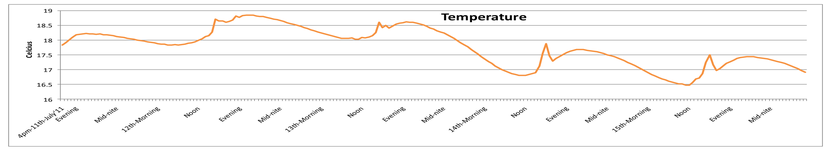


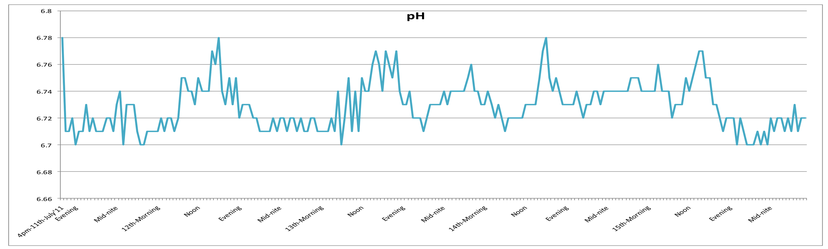


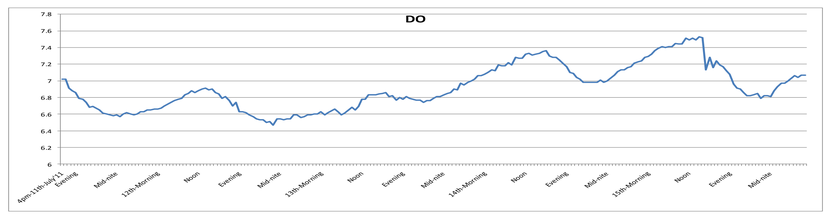


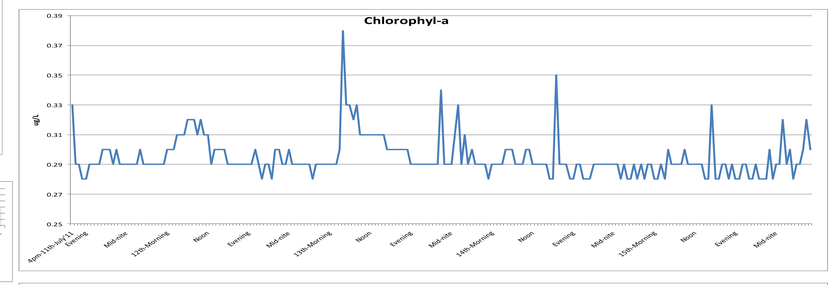


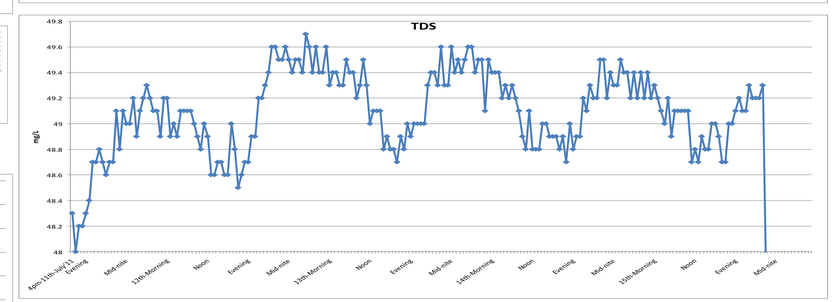
Hydrolab Sonde MS5 Data











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