



Pike County Conservation District

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PRESS RELEASE - FOR IMMEDIATE RELEASE

Report Details Groundwater Conditions in Pike County

Groundwater – found in the cracks and spaces in underground soil, sand and rock – supplies the majority of Pike County’s drinking water. Recently, the United States Geological Survey (USGS) in cooperation with the Pike County Conservation District (PCCD) released the results of a study of residential groundwater wells in Pike County, Pennsylvania, which shows that Pike’s groundwater is generally within U.S. Environmental Protection Agency (EPA) drinking-water standards.

The study was a collaborative effort between USGS, PCCD, and landowners who gave permission to have their well water tested. The study was paid for by a grant which the Conservation District received from the Marcellus Legacy Fund through the Commonwealth Finance Authority in addition to funds provided by USGS.

The study was conducted by Hydrologist Lisa A. Senior and Research Hydrologist Charles A. Cravotta, III of USGS. The results were published in December 2017 in Scientific Investigations Report 2017-5110, which can be accessed on PCCD’s website PikeConservation.org under the News section.

The 2015 groundwater-quality assessment is intended to provide current data on the occurrence and concentrations of methane and a suite of inorganic constituents in groundwater in bedrock aquifers prior to potential shale-gas development in Pike County. The 2015 groundwater assessment is an expansion of a more limited study completed in 2012, in which 20 Pike County wells were sampled.

“The overall purpose of this study was to establish a baseline on the water quality of existing groundwater throughout Pike County prior to potential land use changes which might include shale-gas development,” says PCCD Executive Director Sally Corrigan. “For example, assessing whether certain parameters such as methane currently exist in Pike County’s groundwater supplies will provide us with a base of information for later comparison should changes pose potential impacts.”

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About the Study

Seventy-nine residential water wells ranging in depths from 80 to 610 feet were sampled during June through September 2015. The groundwater samples were analyzed for chemical and physical properties, nutrients, major ions, trace elements and metals, radioactivity, bacteria, radon-222, and methane and other dissolved hydrocarbon gases.

Samples from 20 of the 79 wells were also analyzed for selected man-made organic compounds, and samples from 13 of the 79 wells were analyzed for radium-226.

Many of the inorganic constituents selected for analysis may be present in elevated concentrations in naturally occurring brines and in flowback and produced waters associated with unconventional shale-gas development and, therefore, are part of the Pennsylvania Department of Environmental Protection pre-drill list of constituents recommended for assessment. However, these same constituents are also commonly present at low to moderate concentrations in shallow, fresh (non-saline) groundwater, as has been shown for previous studies in Pike County and other areas of northeastern Pennsylvania (Senior, 2014; Sloto, 2013; Sloto, 2014; Senior and others, 2016).

Additionally, some of the inorganic constituents included in groundwater analyses for this study can be introduced by human activities not directly related to shale-gas production, such as use of road salt or onsite wastewater disposal.

Study Results

Overall, the quality of the groundwater sampled in Pike County in 2015 was generally within U.S. EPA drinking-water standards. However, in some samples, the testing results for certain water quality parameters – such as arsenic, pH, iron, manganese, bacteria, sodium, total dissolved solids, sulfate, and radon-222 – fell outside drinking-water and Health Advisory standards, indicating water treatment may be needed.

Methane and some constituents – such as sodium, lithium, bromide, and boron – are present at low to moderate concentrations, and in some areas at relatively elevated concentrations. The highest concentrations occurred in the lowlands near areas of regional groundwater discharge, mostly in the eastern part of the county.

However, it should be noted that the methane detected in the study is different than methane related to gas drilling operations. It has a different isotopic fingerprint than that related to gas drilling.

According to study results, “The composition of groundwater varies spatially in Pike County and differs by geologic unit, partly because of differences in aquifer mineralogy and different positions along groundwater flow paths.” For example, groundwater with near neutral pH and with the highest amount of hardness (calcium and magnesium) generally were present in areas of the county that are of intermediate elevation while groundwater with pH values greater than 8 (neutral), low oxygen concentrations, and some methane concentration most frequently were present in lowland areas along stream and river valleys.

Generally, methane was found only in a few wells in this study, and does not show strong evidence of Marcellus influence; the methane was generally microbial in nature.

Additional investigations may be needed to definitively determine the origin of this methane and explain its association with the high pH, sodium-bicarbonate, bromide-enriched groundwater.

The Pike County Conservation District is proud to work with the US Geological Survey to better assess both the quantity and quality of Pike County’s groundwater resource. Visit www.pikeconservation.org for more information.

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