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The Impact of Hydraulic Fracturing on Groundwater Quality in Northeastern Pennsylvania and Investigation of Methods

Over the past decade, hydraulic fracturing as an unconventional gas drilling method became increasingly utilized. Hydraulic fracturing is a method that pushes water mixed with sand and chemicals into shale to fracture it and to extract natural gas. In 2012, shale gas made for 40% of total natural gas production in the US, this number is expected to become 53% by 2040. The question of whether or not fracking is safe for the environment, and for groundwater resources has yet to be answered. Potential water pollution sources are chemical spills, production fluid treatment, and well casing leaks. This study investigates the groundwater chemistry in homeowner wells that are in close proximity to gas wells in PA, and compares it to groundwater chemistry in NY, where fracking is banned. There have been two main methods utilized to collect samples; the first is by collecting samples in the field directly from participants' homes, the second is through sending interested participants sampling kits and have them collect their samples to explore possible sampling artifacts and difference in water quality between kitchen tap and pressure tank, and then return samples to the lab to be analyzed (The 100 Bottle Project). Samples were analyzed for major cations, anions, trace metals, dissolved gases, as well as radium. The results show a significant difference between pressure tank and kitchen tap samples. The results from Pennsylvania and New York are still being analyzed.