WEST VIRGINIA
WATER RESEARCH INSTITUTE

THREE RIVERS QUEST

Targeted Study

Northern Allegheny: Pithole Creek

Project Description :

In late 2017, a limited investigation of stream conditions in Pithole Creek, which is located in Venango and Forest counties in the Northern Allegheny River Basin, was completed. Water quality grab samples showed elevated levels of parameters associated with oil and gas production (bromide, chloride, sodium) that exceeded almost all other 3RQ sites collected in the Allegheny River basin since 2013. Continuous logger data also showed conductivity well above the normal limits for a healthy Allegheny Plateau stream.

In 2018, Pithole Creek became a 3RQ targeted study watershed because of the preliminary findings discussed above, its history of oil production, current production activity, and brine application on dirt and gravel roads. This provided a research opportunity to shed some light on produced water (brine) impacts on stream integrity.

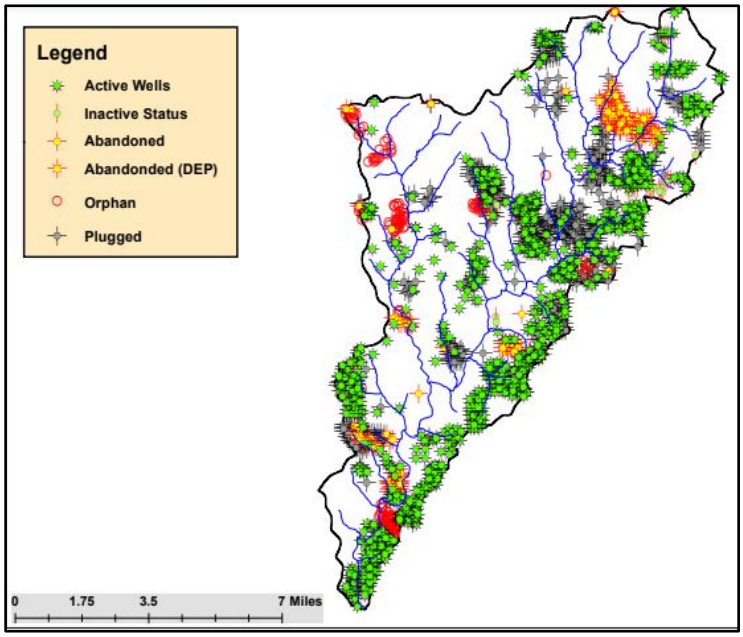

Figure 1. Map of Pithole Creek Watershed showing the well inventory.

Site History:

Extensive oil production began in the Pithole Creek watershed on January 7, 1865 at the Holden Farm on the site now known as Pithole. The well was drilled into the Venango Third Sand about 450 to 550 feet below the...surface. That well initially produced 250 barrels per day which sold for 8 dollars a barrel. On October 9, 1865 the first oil pipeline became operational. It was a 2-inch-diameter line that was laid overland 5.5 miles from Pithole City to a landing at the Miller Farm on Pithole Creek.

Pithole City would experience a major oil boom and subsequent bust. Today there is a museum at Pithole documenting the history of the boom, numerous fires, and the transition from oil being transported by teamsters in barrels in wagons to the use of oil pipelines.

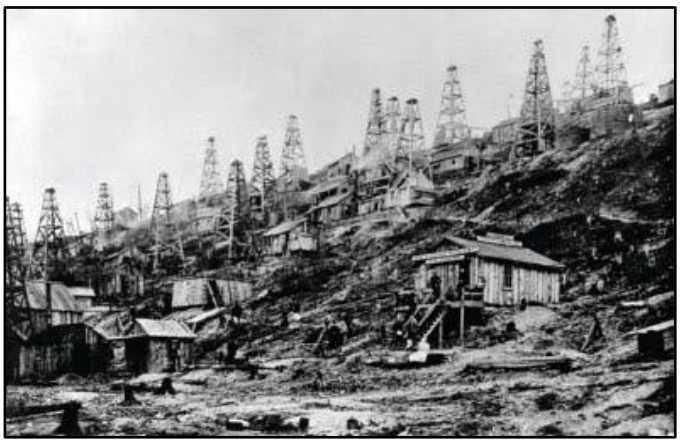

Figure 2. Image of the oil derricks located on the site that is now known as Pithole.

3RQ Research :

As of 2018 there were 950 active conventional production wells in the watershed. Additionally, many townships in the watershed had long used conventional produced water (brine) for dust control on dirt and gravel roads. To study these impacts, 3RQ collected grab samples at nine locations and placed continuous data loggers in five locations during 2018. The study found that conductivity in Pitthole Creek was higher than that of unimpacted streams in the Appalachian Plateau and that the presence of bromide, chloride, and sodium were likely associated with conventional oil and gas production. 3RQ continues to perform regular sampling at Pine Creek and the other Northern Allegheny sites to monitor water quality.