

Methane monitoring method reveals high levels in Pennsylvania stream

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A new stream-based monitoring system recently discovered high levels of methane in a Pennsylvania stream near the site of a reported Marcellus shale gas well leak, according to researchers at Penn State and the U.S. Geological Survey. The system could be a valuable screening tool to assess the environmental impact of extracting natural gas using fracking.

Multiple samples from the stream, Sugar Run in Lycoming County, showed a groundwater inflow of thermogenic methane, consistent with what would be found in [shale gas](#), the researchers report in a recent issue of *Environmental Science and Technology*. Victor Heilweil, research hydrologist, Utah Water Science Center, USGS, was lead author on the paper.

"I found it startling that our USGS and Penn State team of four people did a reconnaissance of 15 streams and discovered one instance of [natural gas](#) degassing into a stream that may very well be explained by a nearby leaking shale [gas](#) well," said Susan Brantley, distinguished professor of geosciences and director of the Earth and Environmental Systems Institute at Penn State.

After testing Sugar Run and finding high methane levels, researchers learned that several nearby domestic water supplies were reportedly contaminated by a Marcellus gas well that had a defective casing or cement, according to the researchers.

Additional analyses of the degassing methane revealed characteristics also observed at the leaking gas well, but scientists were not able to prove the methane in Sugar Run is caused by the leak because they do not have baseline samples of the stream. Still, the researchers pointed to the findings to show stream [monitoring](#) is an effective, efficient method for monitoring shale-gas impacts.

"We hope this new technique developed by the USGS can now be used as a way of monitoring stray gas not only when it gets into drinking water, but when it gets into streams, which are much easier to access than homeowner wells," said Brantley, a co-author of the study. "In addition, streams collect water from nearby areas and may be very cost effective waters to target for monitoring because they integrate over larger land areas."

Most monitoring around gas wells has traditionally been limited to domestic water wells. Testing that way alone, especially in rural areas where the wells are spread out, has made assessing the true impact of wells difficult, researchers said in the report.

"Watersheds funnel [water](#) and chemicals to streams and by sampling at the end of the funnel we are able to find leaks that would otherwise be like looking for a needle in a haystack," said Kip Solomon, professor of geology and director of the Noble Gas Laboratory at the University of Utah, another co-author of the report.

Provided by Pennsylvania State University

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