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**Factors affecting the variability of stray gas concentration and composition in groundwater**Gorody, Anthony W., 2012, Environmental Geosciences, v.19, no.1, p. 17-31, doi: 10.1306/eg.12081111013.

**Abstract**

Identifying the source of stray gas in drinking water supplies principally relies on comparing the gas composition in affected water supplies with gas samples collected in shows while drilling, produced gases, casing head gases, pipeline gases, and other potential point sources. However, transport dynamics of free and dissolved gas migration in groundwater aquifers can modify both the concentration and the composition of point source stray gases flowing to aquifers and occurring in the groundwater environment. Accordingly, baseline and forensic investigations related to stray gas sources need to address the effects of mixing, dilution, and oxidation reactions in the context of regional and local hydrology. Understanding and interpreting such effects are best addressed by collecting and analyzing multiple samples from baseline groundwater investigations, potential point sources, and impacted water resources.

Several case studies presented here illustrate examples of the natural variability in gas composition and concentration data evident when multiple samples are collected from produced gases, casing head gases, and baseline groundwater investigations. Results show that analyses of single samples from either potential contaminant point sources or groundwater and surface water resources may not always be sufficient to document site-specific baseline conditions. Results also demonstrate the need to consistently sample and analyze a variety of baseline groundwater and gas composition screening parameters. A multidisciplinary approach is the best practice for differentiating among the effects of fluid and gas mixing, dilution, and natural attenuation.

A complete copy of this article may be obtained through: <http://eg.geoscienceworld.org/content/19/1/17.abstract>

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