

## Vapor Intrusion at Former Manufactured Gas Plants: Do the Petroleum Hydrocarbon Site Exclusion Criteria Apply?

**Aaron Christensen** (achristensen@burnsmcd.com)

(Burns & McDonnell Engineering Company, Pasadena, CA, USA)

Diana Marquez (dmarque@burnsmcd.com)

(Burns & McDonnell Engineering Company, Kansas City, MO, USA)

**Background/Objectives.** Hundreds of former manufactured gas plant (MGP) sites exist throughout the country, many of which are located in urban settings or similarly developed communities. Many of these sites are currently being used for residential or industrial purposes, and still others are located in areas that are desirable for future development. Typical contaminants of concern at MGP sites include benzene and naphthalene, as well as other compounds that are common petroleum constituents.

Many regulatory programs require evaluation of the vapor intrusion (VI) exposure route during the course of investigation, remediation, management, and closure of MGP sites. However, much of the regulatory framework is blind to the distinct differences in VI behavior between chlorinated solvents and the petroleum hydrocarbon chemicals that are found at MGP sites. Two recent guidance documents (one published by the USEPA Office of Underground Storage Tanks, and the other published by the Interstate Technology Regulatory Council) suggest exclusion criteria that can be used to “screen out” petroleum hydrocarbon-contaminated sites where vapor intrusion is unlikely to be of concern. These criteria are primarily based on distances of separation between contaminants and buildings. The objective of this study was to evaluate the applicability of the petroleum hydrocarbon vapor intrusion guidance to MGP sites.

**Approach/Activities.** A database of information regarding 35 MGP sites in the United States was assembled. Each site was evaluated in two ways to determine whether vapor intrusion was a potential risk: 1) using separation distances and other screening criteria provided in the petroleum hydrocarbon vapor intrusion guidance, and 2) using the results of vapor intrusion sampling. The conclusions of the risk evaluations were compared to identify patterns and assess agreement.

**Results/Lessons Learned.** Results indicate that the exclusion criteria presented in the two guidance documents for petroleum hydrocarbon vapor intrusion are adequately protective. However, the exclusion criteria may be overly conservative, because they frequently failed to screen out sites at which the results of vapor intrusion sampling confirmed there was no unacceptable risk. Expansion of the database is recommended, and may allow for development of MGP-specific exclusion criteria. Improved MGP VI exclusion criteria could potentially reduce obstacles to regulatory closure at MGP sites.