



HAZARD ALERT

Hazards of Permeation and Leaching with Pipes Constructed of Polymeric Materials

A recent event at a refinery has brought attention to the use of polymeric based pipe that may be located in an area with potential exposure to hydrocarbon material. Pipes constructed of these materials i.e. polybutylene, polyethylene, polyvinyl chloride (PVC), and acrylonitrile-butadiene-styrene (ABS), which are essentially plastic, are prone to permeation in the right environment. Pre 1977 PVC has had some indications with leaching of organic chemicals.

Pipe of small diameter with low flows, like piping supplying drinking water, may be the most at risk. Soils which may have been contaminated with organic compounds (hydrocarbons) might permeate the pipe over a period of time.



Indicators that there may be an issue of permeation by petroleum products, which may contain multiple compounds, would be an odor or taste of the water. This would require immediate testing of the water as most hydrocarbon compounds would be at an unsafe level for consumption if they were identifiable by taste or odor.

The permeation cannot be mitigated by flushing; the only solution is to replace the piping.

If you plan on using a plastic based piping to supply drinking water be sure that ground the piping will be buried in is not prone to leaks of hydrocarbons and the new pipe is backfilled with clean fill material.

There are no identified standards to cover the installation of a specific piping for a specific purpose. The issue of permeation and leaching may also be present with piping of other mediums, such as concrete. It is best to check with the manufacturer of the pipe prior to installation as to accepted uses.

This is not a common occurrence but has been documented when the pipe is in an environment where excess hydrocarbons may have leaked into the soil. For more information on leaching and permeation of plastic based piping, refer to the publication found at:

http://epa.gov/ogwdw/disinfection/tcr/pdfs/whitepaper_tcr_permation-leaching.pdf



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This hazard alert is based on an actual incident, and reflects our best understanding of the incident at the time it was written. However, many incidents have multiple causes; this alert may not cover all of them. The purpose of the alert is to illustrate workplace hazards; it is not intended to be a comprehensive report on the incident.