



## **Dry Cleaner Hazards/Remediation**

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I. Perchloroethylene, also known as perc, PCE, tetrachloroethylene and tetrachloroethylene, is a solvent used in dry cleaning. Approximately 28,000 U.S. dry cleaners use perchloroethylene, which is the only air toxic emitted from the dry cleaning process.

II. The Clean Air Act requires EPA to regulate air toxics from large industrial facilities in two phases. Perchloroethylene, or perc, is one of the air toxics emissions that EPA regulates.

A. First phase: In the first, technology-based phase, EPA develops particular standards for controlling the emissions of air toxics from sources in an industry group, or a "source category." One such example of a source category is dry cleaners.

1. MACT standards: These standards, termed "maximum achievable control technology", or "MACT" standards, are based on the emissions levels achieved by facilities that emit the lowest among ALL facilities in that industry. For dry cleaners, EPA finalized the perchloroethylene dry cleaning MACT standards in September of 1993. MACT dry cleaning standards apply to the largest dry cleaning facilities.

2. GACT standards: "Generally available control technology" standards, for smaller "area" sources, are more flexible requirements than MACT standards. For example, GACT standards do not have a requirement to set a control baseline or "floor" equal to the controls used for the best performing 12 percent of a type of facility. GACT standards also allow cost-effectiveness of air pollution controls to be considered.

B. Second phase: In the second phase, EPA is required under the Clean Air Act to conduct two reviews.

1. Technology review: EPA is required to review the technology-based standards and revise them, if necessary, to account for improvements in air pollution controls and/or prevention. EPA is to conduct this assessment every eight years.

2. Residual Risk Review: EPA is required to assess the risk remaining after the application of the 1993 MACT standards to determine whether the standards protect

public health with an ample margin of safety. If more protective standards are needed, EPA amends the MACT standards to add what is known as “residual risk standards.” EPA has discretion as to whether it conducts this review for GACT standards.

III. There are three types of perchloroethylene dry cleaners.

A. Large Industrial & Commercial Dry Cleaners

Large industrial and commercial dry cleaners are classified as “major sources,” meaning they emit more than 10 tons of perchloroethylene a year. There are 12 of these large dry cleaners in the United States. These dry cleaners are covered by EPA’s 1993 maximum achievable control technology (MACT) standards.

B. Freestanding Small Drycleaners

Freestanding small dry cleaners are the type of dry cleaner you might see in a strip shopping center or as a stand-alone building. These dry cleaners are classified as “area sources,” which means they emit less than 10 tons of perchloroethylene each year. These smaller dry cleaners are covered by emissions standards known as generally available control technology (GACT) standards, issued in 1993.

C. Small Drycleaners in Apartment Buildings

About 1,300 small “area source” dry cleaners using perchloroethylene are located on the ground floor of residential buildings. Like freestanding small dry cleaners, these co-residential cleaners are covered by emissions standards known as generally available control technology (GACT) standards, issued in 1993. Co-residential facilities pose a unique exposure scenario. Because apartments in these buildings are located very close to these dry cleaners, residents’ exposures and their estimated cancer risks can be much higher than for typical area sources.

IV. How can perchloroethylene contamination in soil be cleaned up?

A. PCE contamination in soil may be cleaned up by excavating the soil, incinerating it, and disposing of the ash in a landfill.

B. It can also be treated in place using a method known as soil vapor extraction. Soil vapor extraction uses a network of perforated pipes placed in the soil to remove PCE vapor from the pore spaces in soil and pass it through activated carbon where it can be captured and eventually destroyed.

C. The particular method used to clean up PCE contamination in soil will depend upon conditions such as PCE concentration, access to contaminated soil, cost of soil disposal, and other site-specific factors

V. How can PCE contamination in groundwater be cleaned up?

A. Pump and Treat is the most common method of treating PCE contamination in groundwater. The pump and treat method uses wells to pull contaminated groundwater from the water-bearing zone or aquifer, treat it above ground, and then discharge it to a sewage treatment plant or other approved location.

B. Bioremediation uses microorganisms such as bacteria, fungi, and yeasts to transform PCE into harmless chemicals. Microorganisms use PCE as a food and energy source for their growth.

C. Phytoremediation uses plants to remove PCE from soil and groundwater. Certain plants take in PCE through their roots as they absorb water and nutrients. Once inside the plants, PCE can be stored in roots, leaves, stems. PCE can also be changed into less harmful chemicals within the plants or released to the air as harmless gases when the plants breathe or transpire.

D. A Permeable Reactive Barrier is a below ground wall made up of a chemically active material such as iron. Iron transforms PCE dissolved in groundwater to less harmful chemicals as it passes through the wall. The cleanup method most appropriate for use at a particular site will depend upon conditions at the site such as PCE concentration, the depth to contaminated groundwater, the types of microorganisms present in the aquifer, and other site-specific factors.

Safe levels of PCE are set at levels many times lower than those shown to cause no adverse health effects in laboratory animals.

If the Phase I Environmental Assessment indicates signs of contamination to be present on the property security then the Lender will require a Phase II Assessment along with the appropriate remediation.