



# TETRACHLOROETHYLENE

## FACT SHEET ON A DRINKING WATER CHEMICAL CONTAMINANT

### GENERAL INFORMATION

#### Synonyms:

- PCE; Perchloroethylene; Perc;  
1,1,2,2-Tetrachloroethylene

#### Chemical Description:

- Chlorinated hydrocarbon with no natural sources

#### Properties:

- Colorless, nonflammable liquid which is heavier than water and has a chloroform-like odor
- High vapor pressure
- Slightly soluble in water

#### Production and Use:

- Used mainly as a solvent in the dry cleaning industry and to a lesser extent as a solvent to degrease metals
- Also used in textile industry and as an intermediate in the synthesis of certain fluorocarbons

### ENVIRONMENTAL PROFILE

#### Occurrence:

- Common contaminant in ground and surface waters, with higher levels found in ground water, and also present in air

#### Releases:

- Most releases are to the atmosphere due to its volatile nature
- Frequently disposed of in the forms of solid and liquid wastes, often directly to land and surface water

#### Environmental Fate:

- **Released to soil:** will evaporate fairly rapidly to the atmosphere; highly mobile in soil (low adsorption to soil) and readily migrates to ground water; may biodegrade slowly to trichloroethylene, dichloroethylene, and vinyl chloride in anaerobic soils with acclimated organisms

- **Released to surface water:** will evaporate rapidly to the atmosphere (primary removal mechanism); chemical and biological degradation expected to be very slow; not expected to bioconcentrate in aquatic organisms or adsorb to sediment; in ground water, expected to persist for months or years;
- **Released to air:** expected to exist in the vapor phase where it will degrade; has been detected in rain

### HEALTH EFFECTS

#### Humans:

- Liver, kidney, and central nervous system (CNS) effects have been observed in humans occupationally exposed to tetrachloroethylene

#### Experimental Animals:

- Both short-term and long-term exposures show detrimental effects to the liver, kidney, and CNS
- Teratogenic and mutagenic effects have not been clearly demonstrated
- High carcinogenic potential

### REGULATORY PROFILE

#### Existing Standards:

- **Clean Air Act (CAA):** Not regulated
- **Clean Water Act (CWA):**  
Criteria established
- **Resource Conservation and Recovery Act (RCRA):**  
Hazardous waste
- **Superfund (CERCLA):**  
• Hazardous substance  
• **SARA:** Toxic chemical
- **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):**  
Registered
- **Toxic Substances Control Act (TSCA):**  
Regulated

## HEALTH INFORMATION

### Maximum Contaminant Level Goals (MCLG):

- Non-enforceable levels based solely on an evaluation of possible health risks and exposure, and taking into consideration a margin for public safety
- Set at zero mg/L to protect against cancer

**MCLG for Tetrachlorethylene = Zero mg/L**  
(effective July 1992)

### Maximum Contaminant Levels (MCL):

- Legally enforceable levels for contaminants in public drinking water supplies
- Based on health risks associated with the contaminants, analytical methods for their assay, and water treatment feasibility and practicality aspects
- Exceedance of the MCL in drinking water may result in adverse effects which will depend upon the contaminant concentration in water, amount of water/contaminant ingested, length of exposure, and other biological parameters

**MCL for Tetrachloroethylene = 0.005 mg/L**  
(effective July 1992)

### EPA Health Advisories (HA):

- **Short-term HAs:** Provide acceptable concentrations of contaminants in water for up to 10 day exposures, primarily to evaluate the public health risk resulting from an accidental spill or an emergency contamination situation
- **Longer-term HAs:** Provide guidance for persistent water contamination situations to cover a period of up to 7 years
- **Lifetime HAs:** Derived in the same way as an MCLG

#### Health Advisories:

Short-term HA for a child = 2.0 mg/L  
Longer-term HA for a child = 1.4 mg/L  
Longer-term HA for an adult = 5.0 mg/L  
Lifetime HA = Not recommended

## ANALYTICAL METHODS

- Purge and Trap Gas Chromatography:  
EPA Method 502.1  
EPA Method 503.1

- Purge and Trap Column Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series:  
EPA Method 502.2
- Purged Column Gas Chromatography/Mass Spectrometry:  
EPA Method 524.1
- Capillary Column Gas Chromatography/Mass Spectrometry:  
EPA Method 524.2

## WATER TREATMENT

### Permanent Treatment:

- **Best Available Technology (BAT):**
  - Granular Activated Carbon
  - Packed Tower Aeration

## SHORT-TERM HAZARD ELIMINATION

- If the drinking water standards are exceeded, install BAT or use an alternative drinking water supply such as bottled water

## ADDITIONAL HELP

- State or county health officials can indicate a certified laboratory for testing
- Experts in the state Department of Environmental Protection or Natural Resources may also be of help
- The EPA has toll-free numbers for further information on drinking water quality, treatment technologies, for obtaining Health Advisories, and for other regulatory information
- EPA Hotlines are available Monday through Friday
  - **Safe Drinking Water:** 800-426-4791
  - **National Pesticides:** 800-858-7378
  - **Superfund/RCRA:** 800-424-9346
- For information on the Clean Water Act, call (202) 260-7301
- For information on the Toxic Substances Control Act, call (202) 554-1404
- For information on the Clean Air Act, call (919) 541-2777