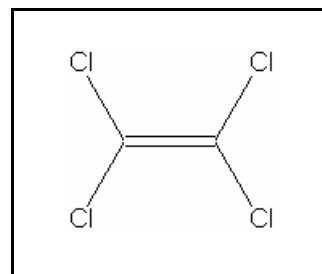




## TIER I HUMAN HEALTH CANCER CRITERIA

### TETRACHLOROETHYLENE

CAS RN: 127-18-4  
Water Solubility: 0.015 g/100 mL at 25 °C  
Log K<sub>ow</sub>: 2.53  
Risk Associated Dose: 3.83 x 10<sup>-4</sup> mg/kg/day  
Carcinogenicity Weight-of-Evidence Classification:



### Standard

The human health cancer tetrachloroethylene criterion for drinking water sources is 11 µg/L.  
The human health cancer criterion for nondrinking water sources is 60 µg/L.

### Calculations

#### Bioaccumulation Factor:

BAF predicted based on Log K<sub>ow</sub> and measured BCF (from Stephan 1993)  
Log K<sub>ow</sub> = 2.53 (shake-flask), K<sub>ow</sub> = 338.8, BCF = 49, Percent lipid = 4.8  
Trophic level 3 FCM = 1.010; trophic level 4 FCM = 1.002

$$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 1.0$$

$$\text{Baseline BAF}_{T3} = (1.010)[(49/1.0)-1](1/0.048) = 1010.084$$

$$\text{Baseline BAF}_{T4} = (1.002)[(49/1.0)-1](1/0.048) = 1002.083$$

$$\text{Human health BAF}_{T3} = [(1010.084)(0.0182)+1](1.0) = 19.38$$

$$\text{Human health BAF}_{T4} = [(1002.083)(0.0310)+1](1.0) = 32.06$$

#### Risk Associated Dose:

$$\text{RAD} = 0.00001/q1^* = 3.83 \times 10^{-4} \text{ mg/kg/d}$$

Where:

RAD = Risk Associated Dose (mg/kg/day)  
 $q1^*$  = Cancer Slope Factor

#### Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HCC} &= [(3.83 \times 10^{-4})(70)]/0.01 + [(0.0036)(19.38) + (0.0114)(32.06)] \\ &= \mathbf{60 \mu g/L} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HCC} &= [(3.83 \times 10^{-4})(70)]/2 + [(0.0036)(19.38) + (0.0114)(32.06)] \\ &= \mathbf{11 \mu g/L} \end{aligned}$$

## References

1. Barrows et al 1980. Bioconcentration and elimination of selected water pollutants by bluegill sunfish (*Lepomis macrochirus*). In: Dynamics, Exposure and Hazard Assessment of Toxic Chemicals. Hague (ed.).
2. Veith, G.D. et al. 1980. An evaluation of using partition coefficients and water solubility to estimate bioconcentration factors for organic chemicals in fish. In: Aquatic Toxicology, ASTM STP 707. Eaton et al. (Eds).

## Acronyms/Abbreviations

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ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service Registry Number
FCM	Food Chain Multiplier
IRIS	Integrated Risk Information System
K <sub>ow</sub>	Octanol-Water Partition Coefficient
LOAEL	Lowest observed adverse effect level
NOAEL	No observed adverse effect level
P (superscript)	Predicted value
UF	Uncertainty factor

## Revision History

April 6, 1998 - Criteria first developed.

September 20, 2000 – Fact sheet updated. No modifications to criteria

## Contact Information

David B. Kallander  
Water Quality Standards Section  
Indiana Department of Environmental Management  
100 North Senate Ave., P.O. Box 6015  
Indianapolis, IN 46206-6015  
(317) 233-2472  
Email: [dkalland@dem.state.in.us](mailto:dkalland@dem.state.in.us)