

~~CRIT-010~~ 33 CRIT-00997
-04034 -00998

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES FOR
1,2-DICHLOROETHANE

Standard:

The procedures described in the Tier II methodology indicate that, except possibly where a locally important species is very sensitive, aquatic organisms should not be affected unacceptably if the four (4) day average concentration of 1,2-dichloroethane does not exceed 860 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 7,300 µg/L more than once every three (3) years on the average.

Calculations:

Acute Aquatic Life:

$$\text{SAV} = \text{lowest GMAV/SAF}$$

$$\text{Lowest GMAV} = 117,499 \mu\text{g/L}$$

$$\text{SAF} = 8.0$$

$$\text{SAV} = 117,499/8.0 = 14,687 \mu\text{g/L}$$

$$\text{SMC} = \text{SAV}/2 = 14,687/2 = 7,300 \mu\text{g/L}$$

Chronic Aquatic Life:

$$\text{SCV} = \text{SAV/SACR}$$

$$\text{SACR} = 17 \text{ (Geometric mean of 18, 18, 14)}$$

$$\text{SCV} = 14,687/17 = 860 \mu\text{g/L}$$

Calculation of ACR's

Fathead Minnows

$$\text{NOEC} = 11,000 \mu\text{g/L}$$

$$\text{LOEC} = 21,000 \mu\text{g/L}$$

$$\text{CV} = \text{Geometric Mean of 11,000 and 21,000} = 15,199$$

$$\text{ACR} = 207,846/15,199 = 14$$

Table 1. GMAVs and SMAVs for 1,2-dichloroethane

<u>Genus Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Species</u>	<u>Species Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Acute- Chronic Ratio</u>	<u>Reference Number</u>
337,876	Cladoceran <u>Daphnia magna</u>	324,000		1
	Cladoceran <u>Daphnia magna</u>	220,000		2
	Cladoceran <u>Daphnia magna</u>	1,430,000		3
	Cladoceran <u>Daphnia magna</u>	270,000		4
	Cladoceran <u>Daphnia magna</u>	160,000		4
117,499	Fathead Minnow <u>Pimephales promelas</u>	118,000		5
	Fathead Minnow <u>Pimephales promelas</u>	117,000		6
198,000	Rainbow Trout <u>Oncorhynchus mykiss</u>	198,000		3

References:

1. Kuhn, R.M., M. Pattard, K.-D. Pernak, and A. Winter 1989. Results of harmful effects of water pollutants to Daphnia magna. Wat. Res. 23(4): 495-499.
2. LeBlanc, G.A. 1980. Acute toxicity of priority pollutants to water flea (Daphnia magna). Bull. Environ. Contam. Toxicol. 24: 684-691.
3. Qureshi, A.A., K.W. Flood, S.R. Thompson 1982. Comparison of a luminescent bacterial test with other bioassays for determining toxicity of pure compounds and

complex effluents. In: Aquatic Toxicology and Hazard Assessment: Fifth Conference, J.G. Pearson, R.B. Foster and W.E. Bishop (Eds.). ASTM Special Technical Publication 766, Philadelphia, PA.

4. Richter, J.E., S.F. Peterson, and C.F. Kleiner 1983. Acute and chronic toxicity of some chlorinated benzenes, chlorinated ethanes, and tetrachloroethylene to *Daphnia magna*. Arch. Environ. Contam. Toxicol. 12: 679-684.
5. Veith, G.D., D.J. Call, and L.T. Brooke 1983. Estimating the acute toxicity of narcotic industrial chemicals to fathead minnows. In: Aquatic Toxicology and Hazard Assessment: Sixth Symposium, ASTM STP 802, W.E. Bishop, R.D. Caldwell and B.B. Heidolph (Eds.). American Society for Testing and Materials, Philadelphia, PA.
6. Wallbridge, C.T., J.T. Fiandt, and G.L. Phipps 1983. Acute toxicity of ten chlorinated hydrocarbons to the fathead minnow (*Pimephales promelas*). Arch. Environ. Contam. Toxicol. 12: 661-666.

Last Modified:
November 24, 1998