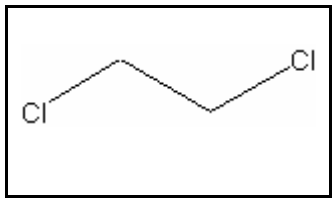
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

1,2-DICHLOROETHANE

CAS RN:	107-06-2
Water Solubility:	8,608 mg/L
Log K_{ow}:	1.458^{P}



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:

SAV = lowest GMAV/SAF

Lowest GMAV = 117,499 µg/L
SAF = 8.0

SAV = 117,499/8.0 = 14,687 µg/L

SMC = SAV/2 = 14,687/2 = **7,300 µg/L**

Chronic Aquatic Life:

SCV = SAV/SACR

SACR = 15 (Geometric mean of 18, 18, 10.53)

SCV = 14,687/15 = **980 μg/L**

Calculation of ACR's

Daphnia magna

NOEC = 11,000 μg/L
LOEC = 21,000 μg/L

CV = Geometric Mean of 11,000 and 21,000 = 15,199

ACR = 160,000/15,199 = 10.53

Data

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

Genus Mean Acute Value (μg/L)	Species	Species Mean Acute Value (μg/L)	Acute-Chronic Ratio	Reference Number
357,360	Cladoceran Daphnia magna	324,000		1
	Cladoceran Daphnia magna	220,000		2
	Cladoceran Daphnia magna	1,430,000		3
	Cladoceran Daphnia magna	160,000	10.53	4
117,499	Fathead Minnow Pimephales promelas	118,000		5
	Fathead Minnow Pimephales promelas	117,000		6

198,000	Rainbow Trout Oncorhynchus mykiss	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.

Acronyms/Abbreviations

CAS RN	Chemical Abstract Service Registry Number
K_{ow}	Octanol-Water Partition Coefficient
P (superscript)	Predicted value
SAV	Secondary Acute Value
GMAV	Genus Mean Acute Value
SAF	Secondary Acute Factor
SMC	Secondary Maximum Concentration
SCC	Secondary Continuous Concentration
SACR	Secondary Acute-Chronic Ratio
FT	Flow-through
S	Static
U	Unmeasured
M	Measured
EVISTRA	Evaluation and Interpretation of Suitable Test Results in AQUIRE (EPA quality checking method/database)

Revision History

November 24, 1998 Values first developed
April 25, 2001 New search for data. No new studies added.
November 15, 2002 ACR was corrected.

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