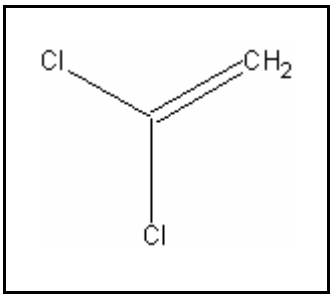
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

1,1-DICHLOROETHYLENE

CAS RN:	75-35-4
Water Solubility:	6,735 mg/L
Log K_{ow}:	2.37^{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 1,1-dichloroethylene does not exceed 210 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 1,900 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 30,272 µg/L
SAF = 8.0

SAV = 30,272/8.0 = 3,784 µg/L

SMC = SAV/2 = 3,784/2 = **1,900 µg/L**

Chronic Aquatic Life:

SCV = SAV/SACR

SACR = 18

SCV = 3,784/18 = **210 μg/L**

Data

Table 1. GMAVs and SMAVs for 1,1-dichloroethylene

Genus Mean Acute Value (μg/L)	Species	Species Mean Acute Value (μg/L)	Acute-Chronic Ratio	Reference Number
127,593	Bluegill Lepomis macrochirus	74,000		1
	Bluegill Lepomis macrochirus	220,000		2
135,099	Fathead Minnow Pimephales promelas	169,000		3
	Fathead Minnow Pimephales promelas	108,000		3
30,272	Cladoceran Daphnia magna	11,600		3
	Cladoceran Daphnia magna	79,000		4

References

1. Buccafusco, R.J., S.J. Ells, and G.A. LeBlanc 1981. Acute toxicity of priority pollutants to bluegill (Lepomis macrochirus). Bull. Environ. Contam. Toxicol. 24(5): 446-452.

2. Dawson,G.W., A.L.Jennings, D.Drozdowski, and E.Rider 1977. The Acute Toxicity of 47 Industrial Chemicals to Fresh and Saltwater Fishes J. Hazard. Mater. 1(4):303-318.

3. Dill,D.C., W.M.McCarty, H.C.Alexander, and E.A.Bartlett 1980. Toxicity of 1,1-Dichloroethylene (Vinylidene Chloride) to Aquatic Organisms. Ecol. Res. Ser., EPA-600/3-80-057, Environ. Res. Lab., U.S. Environ. Prot. Agency, Duluth, MN: 17 p.

4. LeBlanc, G.A. 1980. Acute toxicity of priority pollutants to Daphnia magna. Bull. Environ. Contam. Toxicol. 24(5): 684-691.

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

June 22, 1999	Values first developed
April 24, 2001	New search for data. No new studies added.

Contact Information

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