

Rule 57 Aquatic Values Data Sheet

Chemical name: 1,1,2,2-Tetrachloroethane Developed by: D. Bush FAV: 1800 ug/L (Tier: 2)
 Approved by: *G Sayler* AMV: 910 ug/L (Tier: 2)
 C.A.S #: 79-34-5 Approval date: *7/31/07* FCV: 200 ug/L (Tier: 2)
 Literature search date: 7/10/07 Acute CF: ---- Chronic CF: ----

ACUTE DATA

Species	Test type (EC or LC50)	Duration (hours)	Test conditions (FT,M, etc.)	Hardness mg/L	Chemical	LC50/EC50 ug/L	SMAV ug/L	GMAV ug/L	Rank	Refer
Water Flea (<i>Daphnia magna</i>)	LC50	48	S,U	72		9,300	14,625	14,625	1	1
	EC50	48	S,M	44.7		23,000				2
	LC50	48	S,M	44.7		62,000*				2
American Flagfish (<i>Jordanella floridae</i>)	LC50	96	FT,M	48.0		18,480	18,480	18,480	2	3
	LC50	96	SR,U	48.0		26,800**				3
Fathead Minnow (<i>Pimephales promelas</i>)	LC50	96	FT,M	45.2		20,300	20,350	20,350	3	4
	LC50	96	FT,M	45.1		20,400				5

* This value was not used because an EC50 is a higher priority than an LC50 from the same test.

** This value was not used because a FT,M test is a higher priority than a SR,U test.

CHRONIC DATA

Species	Test type (ELS, etc.)	Duration (days)	Study Conditions (FT,M etc.)	Hardness mg/L	NOEC/LOEC	MATC ug/L	SMCV ug/L	GMCV ug/L	Rank	Reference
Water flea (<i>Daphnia magna</i>)	LC	28	SR,M	44.7	6,900/14,000	9,829	9,829	9,829	1	2

References:

1. LeBlanc, G.A. 1980. Acute toxicity of priority pollutants to water flea (*Daphnia magna*). Bull. Environ. Contam. Toxicol. 24(5):684-691.
2. 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(6):679-684.
3. Smith, A.D., A. Bharath, C. Mallard, D. Orr, et al. 1991. The acute and chronic toxicity of ten chlorinated organic compounds to the American flagfish (*Jordanella floridae*). Arch. Environ. Contam. Toxicol. 20(1):94-102. (chronic test not used because test duration insufficient and test animals too old)
4. Geiger, D.L., C.E. Northcott, D.J. Call, and L.T. Brooke. 1985. Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), Volume 2. Center for Lake Superior Environmental Studies, University of Wisconsin-Superior, Superior, WI:326p.
5. Walbridge, C.T., J.T. Fiandt, G.L. Phipps, and G.W. Holcombe. 1983. Acute toxicity of ten chlorinated aliphatic hydrocarbons to the fathead minnow (*Pimephales promelas*). Arch. Environ. Contam. Toxicol. 12(6):661-666.

References reviewed, but not used:

1. Buccafusco, R.J., S.J. Eells, and G.A. LeBlanc. 1981. Acute toxicity of priority pollutants to bluegill (*Lepomis macrochirus*). Bull. Environ. Contam. Toxicol. 26(4):446-452. (reject - low dissolved oxygen in undetermined test runs, solubility problems coupled with unmeasured test concentrations)

Table 1. Derivation of acute-to-chronic (ACR) ratio for *Daphnia magna*.

<u>48-hour EC50</u>	<u>MATC</u>	<u>ACR</u>	<u>Reference</u>
23,000 µg/L	9,829 µg/L	2.3400	Richter et al. (1983)

Min. data req. met	Acute Factor
2	13
<u>3</u>	<u>8</u>
4	7
5	6.1
6	5.2
7	4.3

Rule 57 Aquatic Values Work Sheet

Chemical Name: 1,1,2,2-Tetrachloroethane
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AQUATIC MAXIMUM VALUE CALCULATIONS

A. Minimum 8 species requirement is **not** met. Minimum requirements met = 3 (ii, iii, iv)
 Minimum requirements missing for Tier I = 5 (i, v, vi, vii, viii)
 Acute factor = 8

1. Toxicity is **not** dependent on a water characteristic

a. FAV calculation
$$FAV = \frac{14,625 \text{ } \mu\text{g/L}}{8} = 1828 \text{ } \mu\text{g/L} = 1800 \text{ } \mu\text{g/L}$$

2. Toxicity is dependent on a water characteristic

a. Slope = (Table ___)

b. FAV equation:

3. Go to C.

B. Minimum 8 species requirement **is** met (Tier I)

1. Toxicity is **not** dependent on a water characteristic

a. FAV calculation: Att. ___

2. Toxicity is dependent on a water characteristic

a. Slope = (Table ___)

b. Ranked genus mean acute intercepts: Table

c. Final acute intercept = (Att. ___)

In of final acute intercept =

d. FAV equation =

C. Aquatic Maximum Value (AMV) calculation:

$$AMV = \frac{14,625 \text{ } \mu\text{g/L}}{8} \div 2 = 914 \text{ } \mu\text{g/L} = 910 \text{ } \mu\text{g/L}$$

FINAL CHRONIC VALUE CALCULATIONS

- A. Minimum 8 species requirement is **not** met (Tier II). Minimum requirements met = 1 (iv)
Minimum requirements missing for Tier I = 7

1. Acute to chronic ratio

a. Number ACRs meeting minimum data requirements = 1 (Table 1)

b. Acute to chronic ratio = $\sqrt[3]{18 \times 2.3400 \times 18} = 9.1184$

2. Toxicity **is not** dependent on a water characteristic

$$\text{FCV} = \frac{14,625 \text{ } \mu\text{g/L}}{8} \div 9.1184 = 200 \text{ } \mu\text{g/L}$$

3. Toxicity **is** dependent on a water characteristic

a. Slope = (Table)

b. Aquatic chronic intercept = (Table)

In of aquatic chronic intercept =

c. FCV equation =

B. Minimum 8 species requirement **is** met (Tier I)

1. Toxicity **is not** dependent on a water characteristic

a. FCV = (Att.)

2. Toxicity **is** dependent on a water characteristic

a. Slope = (Table)

b. Ranked genus mean chronic intercepts: Table

c. Final chronic intercept = (Att.); In of final chronic intercept =

d. FCV equation =