OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Chemical Name: Thallium Developed by: Chris J. Skalski
CAS # 7440-28-0 Data Retrieval Date: 9-23-97
Internal Code # 117 Fact Sheet Preparation Date: 3-01-06

ACUTE DATA

SPECIES	EC_{50}/LC_{50} (µg/l)	TEST TYPE[a]	DURATION (HOURS)	SMAV[b] (µg/l)	GMAV[b] (µg/l)	REFERENCE NUMBER
Cladoceran	910	S,U	48	1,256	1,256	1
Daphnia magna	990	S,U	48			1
	2,200	S,U	48			2
Bluegill	120,000	S,U	96	125,857	125,857	3
Lepomis macrochirus	132,000	S,U	96			4
Fathead Minnow	860	S,M	96	1,800	1,800	5
Pimephales promelas	1,800	F,M	96			1
Sheepshead Minnow[c]	20,900	S,U	96			6
Cyprinodon variegatus						

[a] S = static; F= flow through; U = unmeasured; M = measured.
[b] SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.
[c] Data for this saltwater species is used in the determination of the secondary acute-chronic ratio but not in the determination of the secondary acute value or acute aquatic value.

CHRONIC DATA

SPECIES	CHRONIC VALUE (µg/l)	METHOD	SMCV[a] (µg/l)	GMCV[a] (µg/l)	REFERENCE NUMBER
Sheepshead Minnow	4,300 - 8,400	Embryo-Larval	6,010	6,010	6
Cyprinidon variegatus	6,010				
Cladoceran	100 - 181	Life Cycle	135	135	1
Daphnia magna	135				
Fathead Minnow	40 - 81	Embryo-Larval	57	57	1
Pimephales promelas	57				

[a] SMCV = Species Mean Chronic Value; GMCV = Genus Mean Chronic Value.

REFERENCES

1. Kimball, G. 1978. The Effects of Lesser Known Metals and One Organic to Fathead Minnows (*Pimephales promelas*) and *Daphnia magna*. Manuscript, Dep. Of Entomology, Fisheries and Wildlife, Univ. of Minnesota, Minneapolis, MN:88 p.

2. LeBlanc, G.A. 1980. Acute Toxicity of Priority Pollutants to Water Flea (*Daphnia magna*). Bull. Environ. Contam. Toxicol. 24(5):684-691.

3. Buccafusco, R.J., S.J. Ells and G.A. LeBlanc. 1981. Acute toxicity of Priority Pollutants to Bluegill (*Lepomis macrochirus*). Bull. Environ. Contam. Toxicol. 26(4):446-452.

4. 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. 1:303-318.

5. LeBlanc, G.A. and J.W. Dean. 1984. Antimony and Thallium Toxicity to Embryos and Larvae of Fathead Minnows (*Pimephales promelas*). Bull. Environ. Contam. Toxicol. 32(5):565-569.

6. USEPA. 1980. Ambient Water Quality Criteria for Thallium. EPA 440/5-80-074.

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CALCULATION OF ACUTE AQUATIC VALUE (AAV)[a]

Data Requirement OAC 3745-1-36(A)(1)	SPECIES	GMAV (µg/l)
(b)	Bluegill	125,857
(c)	Fathead Minnow	1,800
(d)	*Daphnia magna*	1,256

Secondary Acute Factor (SAF) = 8.0

Secondary Acute Value (SAV) = Lowest GMAV ÷ SAF
= 1,256 ÷ 8.0
= 157 = 160 µg/l

Tier II Acute Aquatic Value (AAV) = SAV ÷ 2
= 157 ÷ 2
= 79 µg/l

CALCULATION OF CHRONIC AQUATIC VALUE (CAV)[a]

Experimentally determined Acute-Chronic Ratios (ACRs):

SPECIES	ACUTE VALUE (µg/l)	CHRONIC VALUE (µg/l)	ACUTE-CHRONIC RATIO	SPECIES MEAN ACR
Sheepshead Minnow *Cyprinodon variegatus*	20,900	6,010	3.48	3.48
Cladoceran *Daphnia magna*	949	135	6.76	7.03
Fathead Minnow *Pimephales promelas*	1,800	57	31.58	31.58

Secondary-Acute Chronic Ratio (SACR) = $\sqrt[3]{(3.48)(7.03)(31.58)} = 9.18$

Chronic Aquatic Value (CAV) = SAV ÷ SACR
= 157 ÷ 9.18
= 17 µg/l

[a]See Ohio Administrative Code 3745-1-36 effective February 22, 2002.

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