OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

Chemical Name: Aniline Developed by: Chris J. Skalski
CAS # 62-53-3 Data Retrieval Date: 4-15-02
Internal Code # --- Fact Sheet Preparation Date: 4-19-02

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	119	S,U	48	155	155	1
Ceriodaphnia dubia	146	S,U	48			1
	184	S,U	48			1
	193	S,U	48			1
	146	S,U	48			1
Cladoceran	250	F,M	48	250	158	2
Daphnia magna	300	S,U	48			3
	160	R,M	48			4
	630	S,U	48			5
	630	S,U	48			5
	660	S,U	48			5
	680	S,U	48			5
	360	S,U	48			5
	350	S,U	48			5
	80[c]	S,M	48			16
	170	S,M	48			19
Cladoceran *Daphnia pulex*	100	S,U	48	100	-----	5
Snail *Aplexa hypnorum*	>219,000	F,M	96	>219,000	>219,000	2
Snail *Lymnaea stagnalis*	692,000	R,M	96	692,000	692,000	8
Snail *Helisoma trivolvis*	100,000	S,U	96	100,000	100,000	6
Isopod *Asellus intermedius*	>100,000	S,U	96	>100,000	>100,000	6
Flatworm *Dugesia tigrina*	31,600	S,U	96	31,600	31,600	6
Amphipod *Gammarus fasciatus*	>100,000	S,U	96	>100,000	>100,000	6
Oligochaete *Lubriculus variegatus*	>100,000	S,U	96	>100,000	>100,000	6

[a] S = static; R = renewal; F = flow through; M = measured; U = unmeasured.
[b] SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.

[c] Data not used to calculate the SMAV since the test organisms were fed during chemical exposure.

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Midge	412,200	S,U	48	406,003	406,003	7
Chironomus tentans	399,900	S,U	48			7
Midge	287,200	S,U	48			7
Tanypus neopunctipennis	272,100	S,U	48	279,548	279,548	7
Midge	>219,000	F,M	48	>219,000	>219,000	2
Tanytarsus dissimilis						
Midge	427,900	S,U	48	435,139	435,139	7
Einfeldia natchitocheae	442,500	S,U	48			7
Bluegill	49,000	F,M	96	49,000	49,000	2
Lepomis macrochirus						
Rainbow Trout	33,500	F,M	96	26,861	26,861	9
Oncorhynchus mykiss	10,600	F,M	96			10
	36,200	F,M	96			11
	40,500	F,M	96			2
	41,000	R,M	96			18
	20,000	R,M	96			18
Fathead Minnow	75,500	F,M	96	96,821	96,821	12
Pimephales promelas	114,000	F,M	96			12
	32,000	S,U	96			6
	77,900	F,M	96			2
	134,000	F,M	96			13
	68,630[c]	F,M	96			14
	134,000[c]	F,M	96			14
	94,700	F,M	96			15
White Sucker	78,400	F,M	96	78,400	78,400	2
Catostomus commersoni						
Goldfish	187,000	F,M	96	187,000	187,000	2
Carassius auratus						
Guppy	115,000	R,M	96	115,000	115,000	8
Poecilia reticulata						
African Clawed Frog	150,000	S,U	96	150,000	150,000	17
Xenopus laevis						

[a] S = static; R = renewal; F = flow through; M = measured; U = unmeasured.
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CHRONIC DATA

SPECIES	CHRONIC VALUE (µg/l)	METHOD	SMCV[a] (µg/l)	GMCV[a] (µg/l)	REFERENCE NUMBER
Cladoceran *Daphnia magna*	24.6 - 46.7 33.9	Life Cycle	24.6	24.6	20
Cladoceran *Daphnia magna*	10.0 - 31.6 17.8	Life Cycle	-----	-----	22
Fathead Minnow *Pimephales promelas*	423-738 559	Early Life Stage	559	559	21

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

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CALCULATION OF ACUTE AQUATIC VALUE (AAC)[a]

Species	SMAV (µg/l)	Genus	GMAV (µg/l)	Data Set Requirement
Snail	692,000	*Lymnaea*	692,000	
Midge	435,139	*Einfeldia*	435,139	
Midge	406,003	*Chironomus*	406,003	
Midge	279,548	*Tanypus*	279,548	
Midge	>219,000	*Tanytarsus*	>219,000	f
Snail	>219,000	*Aplexa*	>219,000	
Goldfish	187,000	*Carassius*	187,000	
Frog	150,000	*Xenopus*	150,000	
Guppy	115,000	*Poecilia*	115,000	
Isopod	>100,000	*Asellus*	>100,000	
Amphipod	>100,000	*Gammarus*	>100,000	e
Oligochaete	>100,000	*Lumbriculus*	>100,000	
Snail	100,000	*Helisoma*	100,000	g
Fathead Minnow	96,821	*Pimephales*	96,821	
White Sucker	78,400	*Catostomus*	78,400	c
Bluegill	49,000	*Lepomis*	49,000	b
Flatworm	31,600	*Dugesia*	31,600	h
Rainbow Trout	26,861	*Oncorhynchus*	26,861	a
Cladoceran	250	*Daphnia*	158	
Cladoceran	155	*Ceriodaphnia*	155	
Cladoceran	100	*Daphnia*	-----	d

CALCULATION OF ACUTE AQUATIC CRITERION (AAC)[a]

$\sqrt{P}$

Genus	GMAV	ln(GMAV)	ln(GMAV)^2	RANK	P=R/21	
Ceriodaphnia	155	5.0448	25.4499	1	0.0476	0.2182
Daphnia	158	5.0633	25.6372	2	0.0952	0.3086
Oncorhynchus	26,861	10.1984	104.0083	3	0.1429	0.3780
Dugesia	31,600	10.3609	107.3485	4	0.1905	0.4364
TOTALS		30.6675	262.4439		0.4762	1.3412

$S^2 = \frac{262.4439 - (30.6675)^2/4}{} = \frac{27.3206}{} = 1032.156$ $S = 32.1272$

$0.4762 - (1.3412)^2/4 \qquad 0.0265$

$$A = 32.1272\,(\sqrt{0.05}) + (-3.1056) = -4.0783$$

L = [30.6675 - (32.1272) (1.3412)]/4 = -3.1056

Final Acute Value (FAV) = $e^{4.0783}$ = 59.04 = 59 µg/l

AAC = FAV ÷ 2 = 59.04 µg/l ÷ 2 = 29.52 = 30 µg/l

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

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
Cladoceran *Daphnia magna*	170	33.9	5.02	9.20
Cladoceran *Daphnia magna*	300	17.8	16.87	
Fathead Minnow *Pimephales promelas*	114,000	559	204	204[b]

Secondary Acute-Chronic Ratio (SACR) = $\sqrt[3]{(9.20)(18)(18)} = 14.39$

Chronic Aquatic Value (CAV) = FAV ÷ SACR
= 59.04 ÷ 14.39
= 4.1 µg/l

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

[b] Species Mean ACR not used in calculation of the SACR since the species mean acute-chronic ratio was much greater compared to that of *Daphnia magna* and the SMAV was much greater for the fathead minnow than for *Daphnia magna*. Federal guidance states that final acute-chronic ratios should be calculated based upon species mean acute-chronic ratios using species whose SMAVs are close to the final acute value (FAV) when species mean acute-chronic ratios seem to increase as the SMAV increases. Therefore, the SACR was calculated using the species mean acute-chronic ratio for *Daphnia magna*, a species whose SMAV was close to the FAV.

FAV	59 µg/l
AAC	30 µg/l
CAV	4.1 µg/l

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