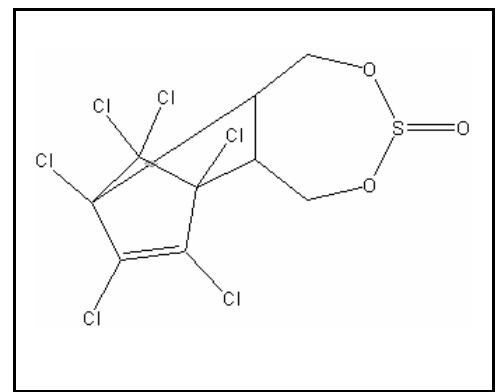




TIER I ACUTE AND CHRONIC AQUATIC LIFE CRITERIA

ENDOSULFAN

CAS RN: 115-29-7
Water Solubility: <0.1 g/100 mL at 23 C
Log K_{ow}: 3.65^P



Standard

The procedures described in the Tier I 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 endosulfan does not exceed 0.05 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 0.10 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

Four Lowest GMAVs:

White sucker	3.2	µg/L
Stonefly	2.3	µg/L
Fathead Minnow	1.305	µg/L
Rainbow Trout	0.6643	µg/L

$$S^2 = 2.5657$$

$$S = 1.6018$$

$$L = -1.9980$$

$$A = -1.6398$$

$$FAV = 0.19$$

$$CMC = FAV/2 = \mathbf{0.10 \mu g/L}$$

Chronic Aquatic Life:

$$FCV = FAV/FACR$$

$$FACR = 3.859 \text{ (Geometric mean of 11, 3, 2.8, 2.4)}$$

$$FCV = 0.19/3.859 = \mathbf{0.05 \mu g/L}$$

Data

Table 1. GMAVs and SMAVs for endosulfan

<u>Genus Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Species</u>	<u>Acute Values ($\mu\text{g/L}$)</u>	<u>Acute- Chronic Ratio</u>	<u>Reference Number</u>
1,890	Snail <u>Aplexa hypnorum</u>	1,890		1
306.9	Cladoceran <u>Daphnia magna</u>	166	11	2
	Cladoceran <u>Daphnia magna</u>	218		3
	Cladoceran <u>Daphnia magna</u>	282		3
	Cladoceran <u>Daphnia magna</u>	250		3
	Cladoceran <u>Daphnia magna</u>	630		3
	Cladoceran	740		3

	<u>Daphnia magna</u>		
	Cladoceran	378	3
	<u>Daphnia magna</u>		
	Cladoceran	266	3
	<u>Daphnia magna</u>		
	Cladoceran	158	3
	<u>Daphnia magna</u>		
	Cladoceran	372	3
	<u>Daphnia magna</u>		
	Cladoceran	328	3
	<u>Daphnia magna</u>		
	Cladoceran	343	3
	<u>Daphnia magna</u>		
	Cladoceran	271	3
	<u>Daphnia magna</u>		
	Cladoceran	62	4
	<u>Daphnia magna</u>		
0.6643	Rainbow Trout	0.86	3
	<u>Oncorhynchus mykiss</u>		
	Rainbow Trout	0.81	3
	<u>Oncorhynchus mykiss</u>		
	Rainbow Trout	0.17	3
	<u>Oncorhynchus mykiss</u>		
	Rainbow Trout	0.29	3
	<u>Oncorhynchus mykiss</u>		
	Rainbow Trout	0.30	3
	<u>Oncorhynchus mykiss</u>		
	Rainbow Trout	0.27	3
	<u>Oncorhynchus mykiss</u>		
	Rainbow Trout	0.26	3
	<u>Oncorhynchus mykiss</u>		

Rainbow Trout <u>Oncorhynchus mykiss</u>	0.41	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.32	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.42	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.26	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.24	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	1.21	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.94	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.49	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.80	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	1.34	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	2.43	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	1.30	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.63	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	1.69	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	1.63	3
Rainbow Trout <u>Oncorhynchus mykiss</u>	0.69	3

	Rainbow Trout <u>Oncorhynchus mykiss</u>	0.79		3
	Rainbow Trout <u>Oncorhynchus mykiss</u>	2.6		3
	Rainbow Trout <u>Oncorhynchus mykiss</u>	1.7		3
	Rainbow Trout <u>Oncorhynchus mykiss</u>	1.5		3
	Rainbow Trout <u>Oncorhynchus mykiss</u>	0.8		4
	Rainbow Trout <u>Oncorhynchus mykiss</u>	0.3		4
1.305	Fathead Minnow <u>Pimephales promelas</u>	1.2	3.0	3
	Fathead Minnow <u>Pimephales promelas</u>	1.01		3
	Fathead Minnow <u>Pimephales promelas</u>	0.29		3
	Fathead Minnow <u>Pimephales promelas</u>	0.45		3
	Fathead Minnow <u>Pimephales promelas</u>	0.76		3
	Fathead Minnow <u>Pimephales promelas</u>	0.73		3
	Fathead Minnow <u>Pimephales promelas</u>	0.81		3
	Fathead Minnow <u>Pimephales promelas</u>	1.67		3
	Fathead Minnow <u>Pimephales promelas</u>	1.57		3
	Fathead Minnow	0.75		3

	<u>Pimephales promelas</u>		
	Fathead Minnow	1.00	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	2.35	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	3.45	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	2.10	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	3.2	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	1.7	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	1.48	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	1.9	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	0.97	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	1.35	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	1.20	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	3.2	3
	<u>Pimephales promelas</u>		
	Fathead Minnow	2.5	3
	<u>Pimephales promelas</u>		
3.2	White sucker	3.0	4
	<u>Catostomus commersoni</u>		
	White sucker	3.5	4
	<u>Catostomus commersoni</u>		

3.7	Guppy <u>Poecilia reticulata</u>	3.7	5
3.811	Bluegill <u>Lepomis macrochirus</u>	3.3	5
	Bluegill <u>Lepomis macrochirus</u>	4.4	5
5.9	Scud <u>Gammarus lacustris</u>	5.8	6
	Scud <u>Gammarus fasciatus</u>	6.0	7
2.3	Stonefly <u>Pteronarcys californica</u>	2.3	8
88	Damselfly <u>Ischnura</u> sp.	71.8	4
	Damselfly <u>Ischnura</u> sp.	107	4
	Mysid Shrimp <u>Mysidopsis bahia</u>	2.8	9
	Sheepshead Minnow <u>Cyprinodon variegatus</u>	2.4	9

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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

September 29, 1999 Values first developed
 May 16, 2001 New search for data. No new studies added.

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