

## OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

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Chemical Name: HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine) Developed by: Chris J. SkalskiCAS # 2691-41-0 Data Retrieval Date: 12-06-01Internal Code # --- Fact Sheet Preparation Date: 3-01-06ACUTE DATA

<u>SPECIES</u>	<u>EC<sub>50</sub>/LC<sub>50</sub> (µg/l)</u>	<u>TEST TYPE<sup>a</sup></u>	<u>DURATION (HOURS)</u>	<u>SMAV<sup>b</sup> (µg/l)</u>	<u>GMAV<sup>b</sup> (µg/l)</u>	<u>REFERENCE NUMBER</u>
Cladoceran <i>Daphnia magna</i>	>32,000	S,U	48	>32,000	>32,000	1
Midge <i>Chironomus tentans</i>	>32,000	S,U	96	>32,000	>32,000	1
Channel Catfish <i>Ictalurus punctatus</i>	>32,000	S,U	96	>32,000	>32,000	1
Bluegill <i>Lepomis macrochirus</i>	>32,000	S,U	96	>32,000	>32,000	1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
Rainbow Trout <i>Oncorhynchus mykiss</i>	>32,000	S,U	96	>32,000	>32,000	1
Fathead Minnow <i>Pimephales promelas</i>	>32,000	S,U	96	15,000	15,000	1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	>32,000	S,U	96			1
	15,000	S,U	96			1

<sup>a</sup> S = static; U = unmeasured.<sup>b</sup> SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.

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**CHRONIC DATA**

<u>SPECIES</u>	<u>CHRONIC VALUE</u> ( <u>µg/l</u> )	<u>METHOD</u>	<u>SMCV<sup>a</sup></u> ( <u>µg/l</u> )	<u>GMCV<sup>a</sup></u> ( <u>µg/l</u> )	<u>REFERENCE</u> <u>NUMBER</u>
Cladoceran <i>Ceriodaphnia dubia</i>	>3,900	Life Cycle	>3,900	>3,900	2
Fathead Minnow <i>Pimephales promelas</i>	>3,300	Early Life Stage	>3,300	>3,300	2

<sup>a</sup> SMCV = Species Mean Chronic Value; GMCV = Genus Mean Chronic Value.

**REFERENCES**

1. Bentley, R.E., G.A. LeBlanc, T.A. Hollister and B.H. Sleight III. 1977. Acute Toxicity of 1,3,5,7-Tetranitrooctahydro-1,3,5,7-tetrazocine (HMX) to Aquatic Organisms. U.S. Army Medical Research Development Command, Washington, DC:23 p.
2. Bentley, R.E., S.R. Petrocelli and D.C. Suprenant. 1984. Determination of the Toxicity to Aquatic Organisms of HMX and Related Wastewater Constituents. Part III. Toxicity of HMX, TAX and SEX to Aquatic Organisms. Final Report. AD A172 385. Springborn Bionomics, Inc., Wareham, MA.

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Data Requirement OAC 3745-1-36(A)(1)	SPECIES	GMAV ( $\mu\text{g/l}$ )
(a)	Rainbow Trout	>32,000
(b)	Bluegill	>32,000
(c)	Fathead Minnow	15,000
(d)	<i>Daphnia magna</i>	>32,000
(f)	Midge	>32,000

Secondary Acute Factor (SAF) = 6.1

Secondary Acute Value (SAV) = Lowest GMAV  $\div$  SAF  
 = 15,000  $\div$  6.1  
 = 2,459 = 2,500  $\mu\text{g/l}$

Tier II Acute Aquatic Value (AAV) = SAV  $\div$  2  
 = 2,459  $\div$  2  
 = 1,230 = 1,200  $\mu\text{g/l}$

CALCULATION OF CHRONIC AQUATIC VALUE (CAV)<sup>a</sup>

Experimentally determined Acute-Chronic Ratios (ACRs):

SPECIES	ACUTE VALUE ( $\mu\text{g/l}$ )	CHRONIC VALUE ( $\mu\text{g/l}$ )	ACUTE-CHRONIC RATIO	SPECIES MEAN ACR
Fathead Minnow	15,000	>3,300	<4.55	<4.55
<i>Pimephales promelas</i>				

Secondary Acute-Chronic Ratio (SACR) =  $\sqrt[3]{(4.55)(18)(18)} = 11.38$

Chronic Aquatic Value (CAV) = SAV  $\div$  SACR  
 = 2,459  $\div$  11.38  
 = 216 = 220  $\mu\text{g/l}$

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<sup>a</sup> See Ohio Administrative Code 3745-1-36 effective February 22, 2002.