

7. REGULATIONS AND ADVISORIES

Because of its potential to cause adverse health effects in exposed people, numerous regulations and advisories have been established for HMX by various national agencies. Major regulations and advisories pertaining to HMX are summarized in Table 7- 1.

ATSDR has derived an acute oral MRL of 0.1 mg/kg/day for HMX. The MRL is based on a LOAEL of 100 mg/kg/day for neurological effects in mice exposed for 14 days (Army 1985d). The LOAEL value was divided by an uncertainty factor of 1,000 (10 for use of a LOAEL, 10 for extrapolation from animal to humans, and 10 for human variability).

ATSDR has derived an intermediate oral MRL of 0.05 mg/kg/day for HMX. The MRL is based on a NOAEL of 50 mg/kg/day for hepatic effects in rats exposed for 13 weeks (Army 1985c). The NOAEL value was divided by an uncertainty factor of 100 (10 for extrapolation from animal to humans 10 for human variability) and a modifying factor of 10 for use of a “limited database” and data indicating that mice may be more sensitive than rats.

EPA has derived a chronic oral RfD of 0.05 mg/kg/day for HMX (IRIS 1995; EPA 1995). This value is based on a NOAEL of 50 mg/kg/day for liver lesions in rats exposed for 13 weeks (Army 1985c). The NOAEL was divided by an uncertainty factor of 1,000 to account for extrapolation from animals to humans, uncertainty in the threshold for sensitive humans, and extrapolation from subchronic exposure to chronic exposure.

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TABLE 7-1. Regulations and Guidelines Applicable to HMX

Agency	Description	Information	References
<u>NATIONAL</u>			
Regulations:			
a. Other:			
EPA OSW	Hazardous Waste Wastewater treatment sludges and wastewater from the manufacturing and processing of explosives	Yes	EPA 1986 (40 CFR 261)
	Land Disposal Restrictions	Yes	EPA 1990 (22520) (40 CFR 268)
Department of State	Arms Export Regulations U.S. Munitions List	Yes	Department of State 1992 (22 CFR 121.12)
Bureau of Alcohol, Tobacco and Firearms	Importation, Manufacture, Distribution and Storage of Explosive Materials - List of Explosive Materials	Yes	ATF 1993 (18 U.S.C. 40)
DOT RSPA	Hazardous Materials Regulations Transport of Explosives	Yes	DOT 1990 (49 CFR 117-173)
Guidelines:			
a. Water:			
EPA ODW	Health Advisories 1-day (10-kg child)	5 mg/L	EPA 1995, IRIS 1995
	10-day (10-kg child)	5 mg/L	
	Longer term (10-kg child)	5 mg/L	
	Longer term (adult)	20 mg/L	
	Lifetime (adult)	0.40 mg/L	
	DWEL	2 mg/L	
b. Other:			
EPA	RfD (oral)	5×10^{-2} mg/kg/day	EPA 1995; IRIS 1995
	Carcinogenic Classification	Group D ^a	EPA 1995; IRIS 1995

^aGroup D = not classifiable as to human carcinogenicity

DOT = Department of Transportation; DWEL = drinking water equivalence level; EPA = Environmental Protection Agency; ODW = Office of Drinking Water; OSW = Office of Solid Waste; RfD = reference dose; RSPA = Research and Special Programs Administration