

CHAPTER 1. RELEVANCE TO PUBLIC HEALTH

1.1 OVERVIEW AND U.S. EXPOSURES

ATSDR's *Toxicological Profile for 1,2-Dibromo-3-chloropropane* was released in 1992. In order to update the literature in this profile, ATSDR conducted a literature search focused on health effects information as described in Appendix B. Chapters 2, 3, and 7 were revised to reflect the most current health effects data. In some cases, other sections of the profile were updated as needed or for consistency with the updated health effects and regulations/guidelines. However, the focus of the update to this profile is on health effects information.

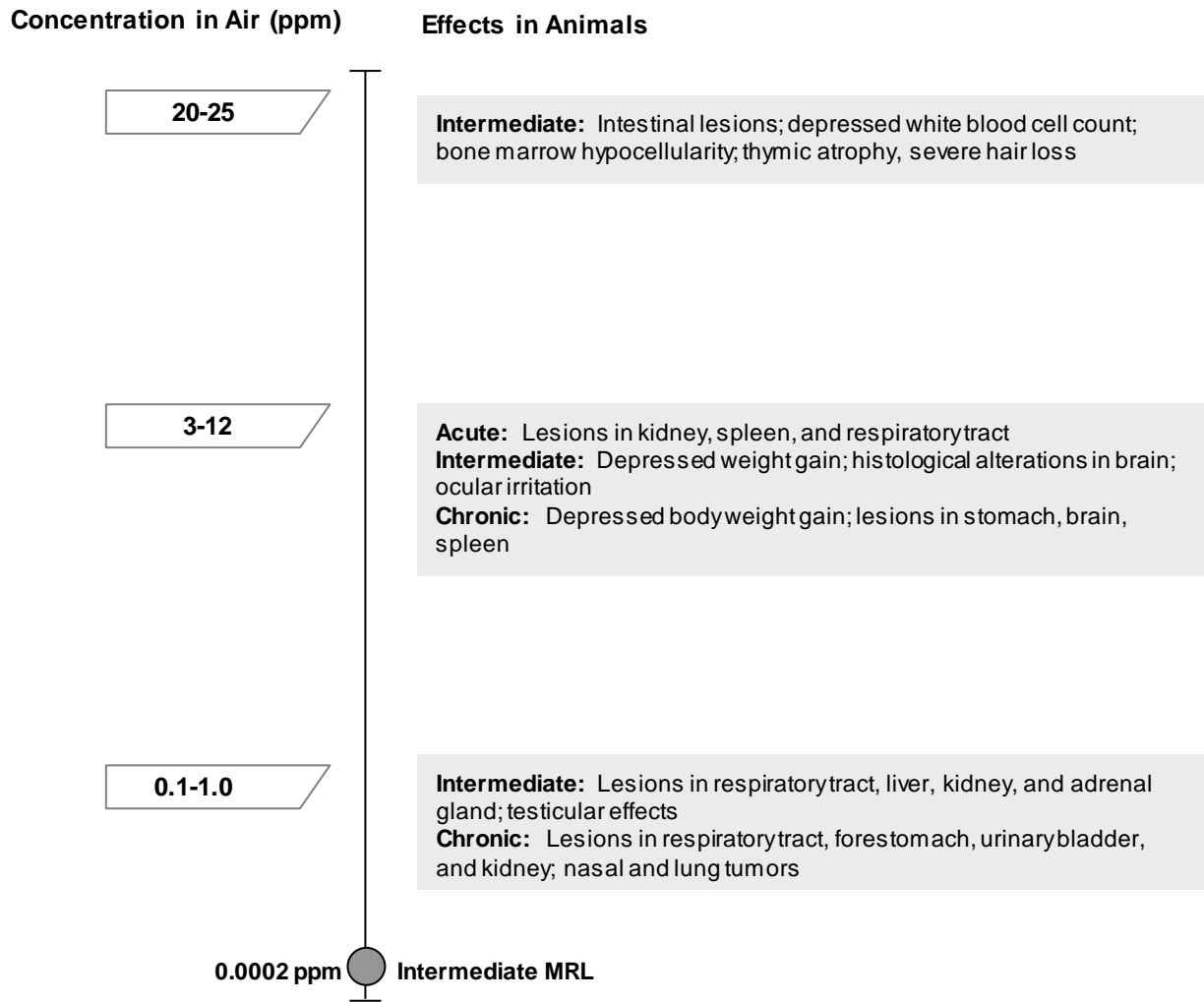
The major sources of 1,2-dibromo-3-chloropropane ($C_3H_5Br_2Cl$; CAS Number 96-12-8) in the environment are from its former use as a soil fumigant (fumes that rid vermin or disinfect) and nematocide (worm killer) on a variety of crops and from unintentional release from hazardous waste sites that contain the chemical. There have been no recent reportable releases of 1,2-dibromo-3-chloropropane to the air, water, or soil (TRI16 2017) because all registered uses as a pesticide were canceled by the U.S. Environmental Protection Agency (EPA) in 1985.

The most likely sources of exposure of the general population to 1,2-dibromo-3-chloropropane are from drinking water that may have been contaminated in areas where the chemical was used for agricultural purposes or from food sources grown in soil that may still contain residues. However, it is not likely that the general population would be exposed to 1,2-dibromo-3-chloropropane levels in drinking water or food sources that would be high enough to cause adverse health effects.

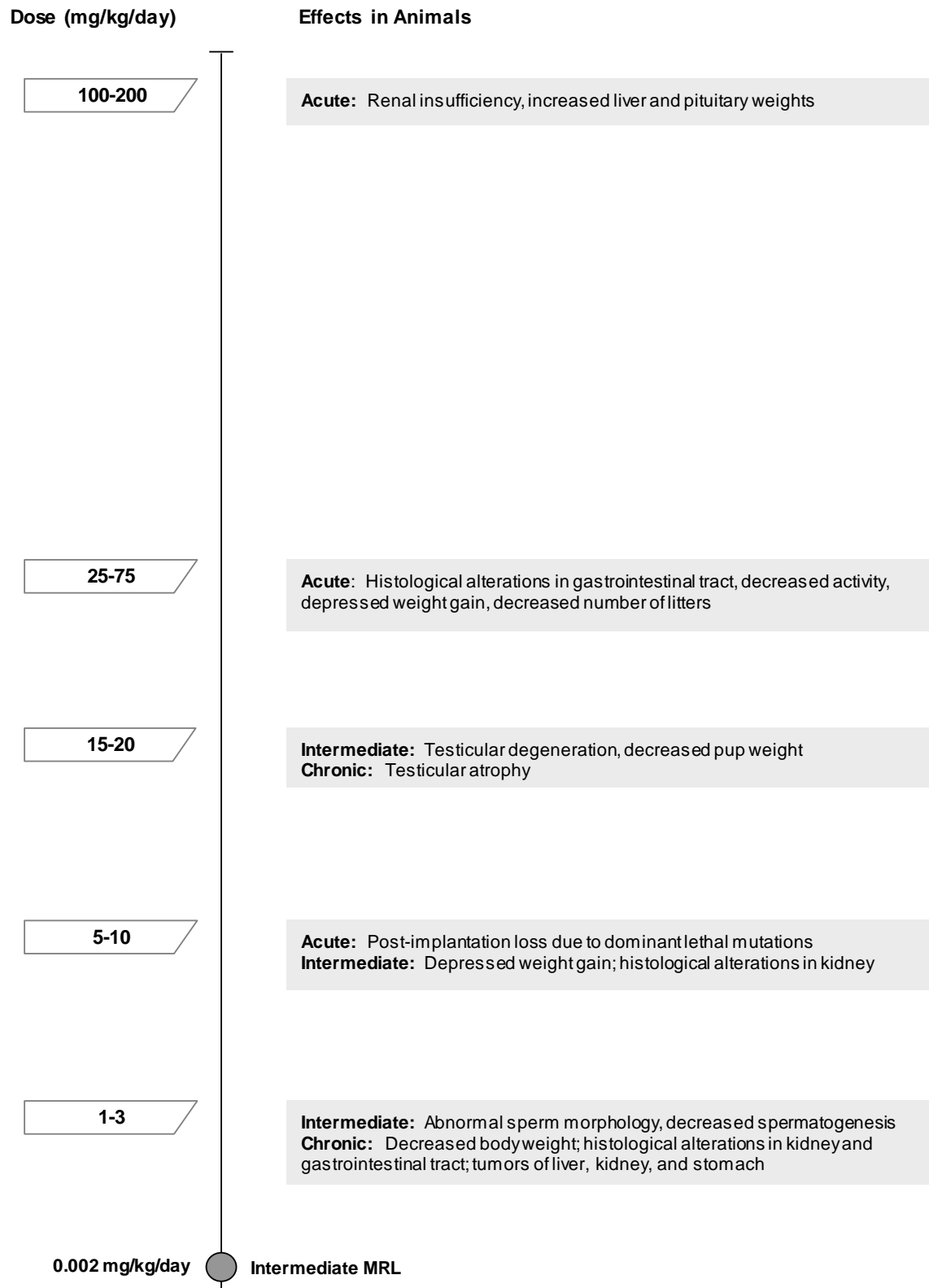
1.2 SUMMARY OF HEALTH EFFECTS

As illustrated in Figures 1-1 and 1-2, the most sensitive effects associated with inhalation and oral exposure are testicular, renal, liver, body weight, gastrointestinal, and respiratory effects.

1. RELEVANCE TO PUBLIC HEALTH

Figure 1-1. Health Effects Found in Animals Following Inhalation Exposure to 1,2-Dibromo-3-Chloropropane

1. RELEVANCE TO PUBLIC HEALTH

Figure 1-2. Health Effects Found in Animals Following Oral Exposure to 1,2-Dibromo-3-Chloropropane

1. RELEVANCE TO PUBLIC HEALTH

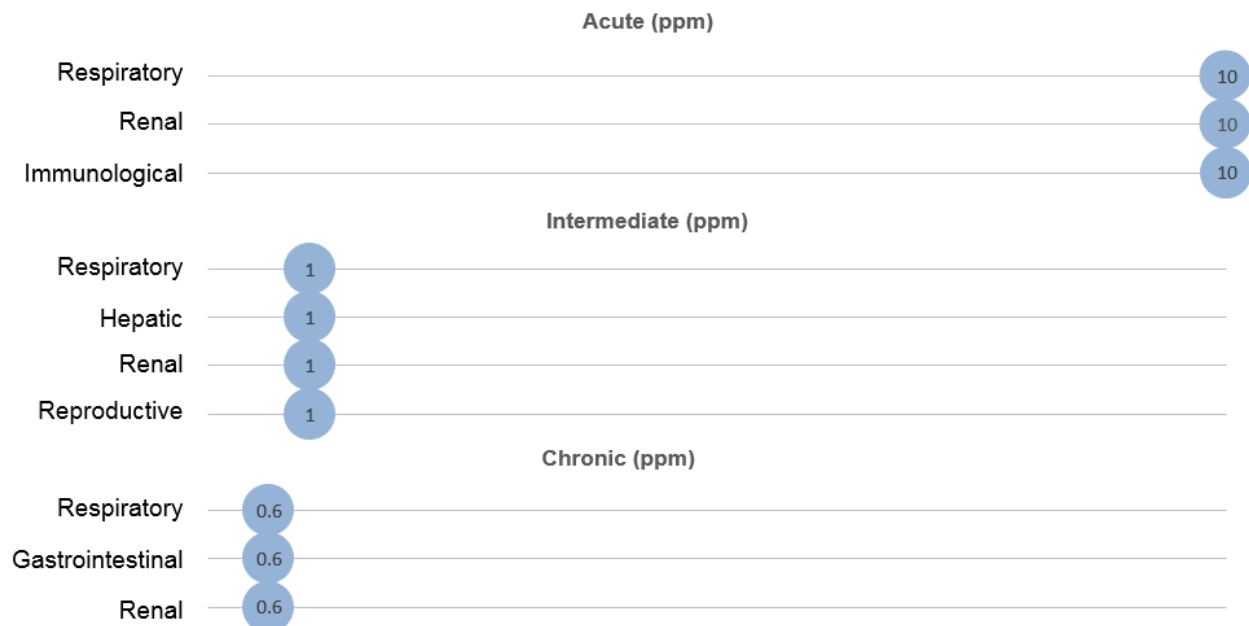
1.3 MINIMAL RISK LEVELS (MRLs)

As presented in Figure 1-3, limited inhalation data from animals indicate the respiratory, renal, and gastrointestinal systems as particularly sensitive targets of 1,2-dibromo-3-chloropropane toxicity. The MRL value for intermediate-duration inhalation exposure to 1,2-dibromo-3-chloropropane is summarized in Table 1-1 and discussed in greater detail in Appendix A. As presented in Figure 1-4, available oral data from animals indicate the gastrointestinal, male reproductive, and renal systems as particular sensitive targets of 1,2-dibromo-3-chloropropane toxicity. The MRL value for intermediate-duration oral exposure to 1,2-dibromo-3-chloropropane is summarized in Table 1-1 and discussed in greater detail in Appendix A. The databases were considered inadequate for derivation of acute- or chronic-duration inhalation or oral MRLs; see Appendix A for more details.

Figure 1-3. Summary of Sensitive Targets of 1,2-Dibromo-3-Chloropropane -- Inhalation

The renal system, respiratory tract, gastrointestinal tract, and liver are the most sensitive targets of 1,2-dibromo-3-chloropropane.

Numbers in circles are the lowest LOAELs (ppm) among health effects in animals; no human data were identified.

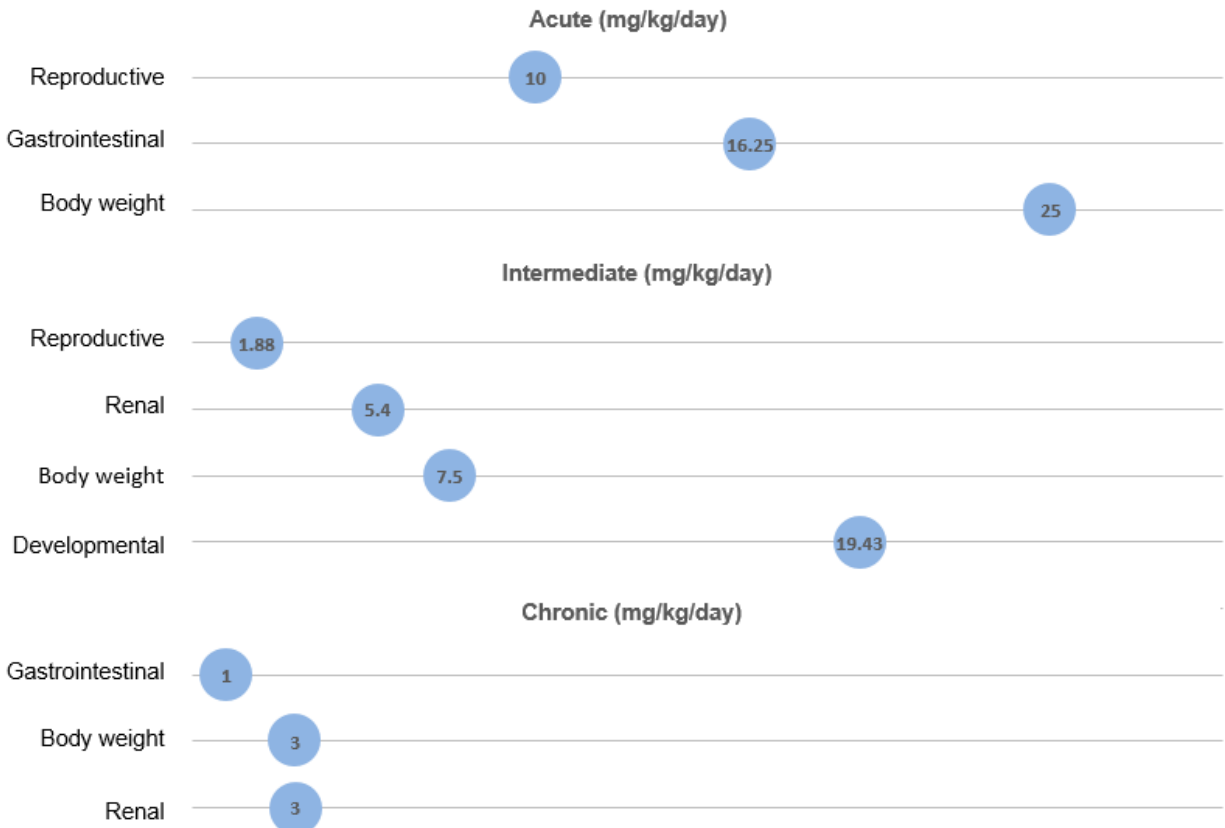


1. RELEVANCE TO PUBLIC HEALTH

Figure 1-4. Summary of Sensitive Targets of 1,2-Dibromo-3-Chloropropane -- Oral

The gastrointestinal tract and male reproductive system are the most sensitive targets of 1,2-dibromo-3-chloropropane.

Numbers in circles are the lowest LOAELs (mg/kg/day) among health effects in animals; no reliable dose response data were available for humans.



1. RELEVANCE TO PUBLIC HEALTH

Table 1-1. Minimal Risk Levels (MRLs) for 1,2-Dibromo-3-Chloropropane^a

Exposure duration	MRL	Critical effect	Point of departure	Uncertainty factor	Reference
Inhalation exposure (ppm)					
Acute	Insufficient data for MRL derivation				
Intermediate	0.0002	Impaired spermatogenesis; testicular atrophy	0.1 (NOAEL)	100	Rao et al. 1982
Chronic	Insufficient data for MRL derivation				
Oral exposure (mg/kg/day)					
Acute	Insufficient data for MRL derivation				
Intermediate	0.002	Impaired spermatogenesis and sperm morphology	1.88 (LOAEL)	1,000	Foote et al. 1986a, 1986b
Chronic	Insufficient data for MRL derivation				

^aSee Appendix A for additional information.

LOAEL = lowest-observed-adverse-effect level; NOAEL = no-observed-adverse-effect level