CHAPTER 7. REGULATIONS AND GUIDELINES

Pertinent international and national regulations, advisories, and guidelines regarding mercury in air, water, and other media are summarized in Table 7-1. This table is not an exhaustive list, and current regulations should be verified by the appropriate regulatory agency.

ATSDR develops MRLs, which are substance-specific guidelines intended to serve as screening levels by ATSDR health assessors and other responders to identify contaminants and potential health effects that may be of concern at hazardous waste sites. See Section 1.3 and Appendix A for detailed information on the MRLs for mercury.

Table 7-1. Regulations and Guidelines Applicable to Mercury (Hg)

Agency	Description	Information	Reference
	Air		
EPA	RfC		IRIS 1995a
	Mercury, elemental	$3x10^{-4}$ mg/m^3 (0.00004 ppm)	
WHO	Air quality guidelines		WHO 2000
	Mercury vapor	1 µg/m^3 annual average (0.0001 ppm)	
	Water & Food		
EPA	Drinking water standards and health advisories		EPA 2018a
	Mercury, inorganic		
	1-Day health advisory (10-kg child)	0.002 mg/L	
	10-Day health advisory (10-kg child)	0.002 mg/L	
	DWEL	0.01 mg/L	
	Lifetime health advisory	0.002 mg/L	
	National primary drinking water regulations	No data	EPA 2009
	Mercury, inorganic		
	MCL	0.002 mg/L	
	RfD		
	Mercuric chloride	$3x10^{-4}$ mg/kg/day	IRIS 1995b
	Methylmercury	$1x10^{-4}$ mg/kg/day	IRIS 2001
	Phenylmercuric acetate	$8x10^{-5}$ mg/kg/day	IRIS 1987
WHO	Drinking water quality guidelines		WHO 2017
	Mercury, inorganic		
	Guideline value	0.006 mg/L	
	TDI	2 µg/kg body weight	

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Agency	Description	Information	Reference
	Provisional tolerable weekly intake		
	Mercury, inorganic	4 µg/kg body weight	WHO 2011
	Methylmercury	1.6 µg/kg body weight	WHO 2007
FDA	Substances added to food[a]	No data	FDA 2020
	Action level in human food and animal feed		
	Mercury		FDA 2018a
	Wheat (pink kernels only)	1 ppm on pink kernels and an average of 10 or more pink kernels/500 g	
	Methylmercury (as Hg)		FDA 2018b
	Fish, shellfish, crustaceans, other aquatic animals (fresh, frozen, or processed)	1 ppm in edible portion	
	Allowable level in bottled water		
	Mercury	0.002 mg/L	FDA 2017b
	Cancer		
HHS	Carcinogenicity classification	No data	NTP 2016
EPA	Carcinogenicity classification		
	Mercury, elemental	D[b]	IRIS 1995a
	Mercuric chloride	C[c]	IRIS 1995b
	Methylmercury	C[c]	IRIS 2001
IARC	Carcinogenicity classification		IARC 1993
	Mercury and inorganic mercury compounds	Group 3[d]	
	Methylmercury compounds	Group 2B[e]	
	Occupational		
OSHA	PEL (8-hour TWA) for general industry, shipyards, and construction		OSHA 2005, 2020a, 2020b, 2020c
	Mercury, except (organo) alkyl compounds (as Hg)	1 mg/10 m³ (0.1 mg/m³)[f]	
	Mercury (organo) alkyl compounds	0.01 mg/m³ [f]	
	PEL (ceiling) for general industry		
	Mercury (organo) alkyl compounds	0.04 mg/m³ [f]	
NIOSH	REL (up to 10-hour TWA)		
	Mercury vapor	0.05 mg/m³ [f]	NIOSH 2019a
	Mercury (organo) alkyl compounds (as Hg)	0.01 mg/m³ [f]	NIOSH 2019b
	REL (ceiling)		
	Mercury compounds except (organo) alkyls (as Hg)	0.1 mg/m³ [f]	NIOSH 2019a
	STEL[g]		
	Mercury (organo) alkyl compounds (as Hg)	0.03 mg/m³ [f]	NIOSH 2019b

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Agency	Description	Information	Reference
	IDLH		
	Mercury compounds except (organo) alkyls (as Hg)	10 mg/m^3	NIOSH 1994a
	Mercury (organo) alkyl compounds (as Hg)	2 mg/m^3	NIOSH 1994b
	Emergency Criteria		
EPA	AEGLs-air		EPA 2018b
	Mercury vapor		
	AEGL 1[h]	Not recommended	
	AEGL 2[h]		
	10-minute	3.1 mg/m^3	
	30-minute	2.1 mg/m^3	
	60-minute	1.7 mg/m^3	
	4-hour	0.67 mg/m^3	
	8-hour	0.33 mg/m^3	
	AEGL 3[h]		
	10-minute	16 mg/m^3	
	30-minute	11 mg/m^3	
	60-minute	8.9 mg/m^3	
	4-hour	2.2 mg/m^3	
	8-hour	2.2 mg/m^3	
DOE	PACs-air		DOE 2018a
	Mercury vapor		
	PAC-1[i]	0.15 mg/m^3	
	PAC-2[i]	1.7 mg/m^3	
	PAC-3[i]	8.9 mg/m^3	
	Mercury(II) chloride		
	PAC-1[i]	0.1 mg/m^3	
	PAC-2[i]	0.14 mg/m^3	
	PAC-3[i]	38 mg/m^3	
	Mercury(I) chloride		
	PAC-1[i]	0.088 mg/m^3	
	PAC-2[i]	0.12 mg/m^3	
	PAC-3[i]	33 mg/m^3	
	Mercuric acetate		
	PAC-1[i]	0.048 mg/m^3	
	PAC-2[i]	0.64 mg/m^3	
	PAC-3[i]	3.2 mg/m^3	
	Dimethylmercury		
	PAC-1[i]	0.034 mg/m^3	
	PAC-2[i]	0.046 mg/m^3	
	PAC-3[i]	2.3 mg/m^3	

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Agency	Description	Information	Reference
	Phenylmercury acetate		
	PAC-1[i]	2 mg/m^3	
	PAC-2[i]	22 mg/m^3	
	PAC-3[i]	47 mg/m^3	
	Methylmercury		
	PAC-1[i]	0.032 mg/m^3	
	PAC-2[i]	0.043 mg/m^3	
	PAC-3[i]	2.1 mg/m^3	

[a]The Substances Added to Food inventory replaces EAFUS and contains the following types of ingredients: food and color additives listed in FDA regulations, flavoring substances evaluated by FEMA or JECFA, GRAS substances listed in FDA regulations, substances approved for specific uses in food prior to September 6, 1958, substances that are listed in FDA regulations as prohibited from use in food, delisted color additives, and some substances "no longer FEMA GRAS".
[b]D: not classifiable as to human carcinogenicity.
[c]C: possible human carcinogen.
[d]Group 3: not classifiable as to its carcinogenicity to humans.
[e]Group 2B: possibly carcinogenic to humans.
[f]Skin notation.
[g]Short-term exposure limit, a 15-minute TWA exposure that should not be exceeded at any time during a workday.
[h]Definitions of AEGL terminology are available from U.S. Environmental Protection Agency (EPA 2018c).
[i]Definitions of PAC terminology are available from U.S. Department of Energy (DOE 2018b).

AEGL = acute exposure guideline levels; DOE = Department of Energy; DWEL = drinking water equivalent level; EAFUS = Everything Added to Food in the United States; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; FEMA = Flavor and Extract Manufacturers Association of the United States; GRAS = generally recognized as safe; HHS = Department of Health and Human Services; IARC = International Agency for Research on Cancer; IDLH = immediately dangerous to life or health; IRIS = Integrated Risk Information System; JECFA = Joint FAO/WHO Expert Committee on Food Additives; MCL = maximum contaminant level; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PAC = protective action criteria; PEL = permissible exposure limit; REL = recommended exposure limit; RfC = inhalation reference concentration; RfD = oral reference dose; STEL = short-term exposure limit; TDI = tolerable daily intake; TWA = time-weighted average; WHO = World Health Organization