CHAPTER 7. REGULATIONS AND GUIDELINES

Pertinent international and national regulations, advisories, and guidelines regarding CDDs 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 CDDs.

Table 7-1. Regulations and Guidelines Applicable to Chlorinated Dibenzo-*p*-Dioxins (CDDs)

Agency	Description	Information	Reference
	Air		
EPA	RfC	Not evaluated	IRIS 2012, IRIS 2002
WHO	Air quality guidelines	Not established[a]	WHO 2000
	Water & Food		
EPA	Drinking water standards and health advisories		EPA 2018a
	2,3,7,8-TCDD		
	1-Day health advisory (10-kg child)	$1x10^{-6}$ mg/L	
	10-Day health advisory (10-kg child)	$1x10^{-7}$ mg/L	
	DWEL	$4x10^{-8}$ mg/L	
	Lifetime health advisory	No data	
	10^{-4} Cancer risk	$2x10^{-8}$ mg/L	
	National primary drinking water regulations		EPA 2009
	2,3,7,8-TCDD		
	Maximum contaminant level	$3x10^{-8}$ mg/L	
	Public health goal	0 mg/L	
	RfD		
	2,3,7,8-TCDD	$7x10^{-10}$ mg/kg/day	IRIS 2012
WHO	Drinking water quality guidelines	No data	WHO 2022
	Provisional tolerable monthly intake		JECFA 2002
	PCDDs, PCDFs, and coplanar PCBs expressed as TEFs	70 pg/kg bw	
FDA	Substances added to food (formerly EAFUS)	Not listed	FDA 2023
	Allowable level in bottled water		FDA 2022
	2,3,7,8-TCDD	$3x10^{-8}$ mg/L	

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Agency	Description	Information	Reference
	Cancer		
HHS	Carcinogenicity classification		
	2,3,7,8-TCDD	Known to be a human carcinogen	NTP 2021
EPA	Carcinogenicity classification		
	HxCDD	B2[b]	IRIS 2002
	Inhalation unit risk		
	HxCDD	1.3 per µg/m^3	IRIS 2002
	Oral slope factor		
	HxCDD	6.2x10^3 per mg/kg/day	IRIS 2002
IARC	Carcinogenicity classification		
	2,3,7,8-TCDD	Group 1[c]	IARC 2012
	2,7-DCDD; 1,2,3,7,8-PeCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDD; 1,2,3,4,6,7,8-HpCDD	Group 3[d]	IARC 1997
	Occupational		
OSHA	PEL (8-hour TWA) for general industry, shipyards, and construction	No data	OSHA 2021a, 2021b, 2021c
NIOSH	2,3,7,8-TCDD	Potential occupational carcinogen	NIOSH 2019
	Emergency Criteria		
EPA	AEGLs-air	No data	EPA 2018b
DOE	PACs-air		DOE 2023a
	2,3,7,8-TCDD; 1,2,3,7,8-PeCDD		
	PAC-1[e]	0.00013 mg/m^3	
	PAC-2[e]	0.0014 mg/m^3	
	PAC-3[e]	0.0085 mg/m^3	
	1,2,3,8-TCDD		
	PAC-1[e]	0.003 mg/m^3	
	PAC-2[e]	0.033 mg/m^3	
	PAC-3[e]	0.2 mg/m^3	
	1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDD		
	PAC-1[e]	0.0013 mg/m^3	
	PAC-2[e]	0.014 mg/m^3	
	PAC-3[e]	0.085 mg/m^3	
	1,2,3,4,6,7,8-HpCDD		
	PAC-1[e]	0.013 mg/m^3	
	PAC-2[e]	0.14 mg/m^3	
	PAC-3[e]	0.85 mg/m^3	

Table 7-1. Regulations and Guidelines Applicable to Chlorinated Dibenzo-*p*-Dioxins (CDDs)

Agency	Description	Information	Reference
	1,2,3,4,6,7,8,9-OCDD		
	PAC-1[e]	0.43 mg/m^3	
	PAC-2[e]	4.7 mg/m^3	
	PAC-3[e]	28 mg/m^3	

[a]An air quality guideline for PCDDs and PCDFs was not proposed because direct inhalation exposures constitute only a small proportion of total exposure, but due to potential importance of the indirect contribution of PCDDs and PCDFs in air to the total human exposure through deposition and uptake in the food chain, measures should be undertaken to further reduce emissions to air from known sources.
[b]B2: probable human carcinogen.
[c]Group 1: carcinogenic to humans.
[d]Group 3: not classifiable as to carcinogenicity to humans.
[e]Definitions of PAC terminology are available from DOE (2023b).

AEGL = acute exposure guideline level; DCDD = dichlorodibenzo-*p*-dioxin; DOE = Department of Energy; DWEL = drinking water equivalent level; EAFUS = Everything Added to Food in the United States; EPA = U.S. Environmental Protection Agency; FDA = Food and Drug Administration; HpCDD = heptachlorodibenzo-*p*-dioxin; HHS = Department of Health and Human Services; HxCDD = hexachlorodibenzo-*p*-dioxin; IARC = International Agency for Research on Cancer; IRIS = Integrated Risk Information System; JECFA = Joint FAO/WHO Expert Committee on Food Additives; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OCDD = octachlorodibenzo-*p*-dioxin; OSHA = Occupational Safety and Health Administration; PAC = protective action criteria; PCB = polychlorinated biphenyl; PCDD = polychlorinated dibenzo-*p*-dioxin; PCDF = polychlorinated dibenzofuran; PeCDD = pentachlorodibenzo-*p*-dioxin; PEL = permissible exposure limit; RfC = inhalation reference concentration; RfD = oral reference dose; TCDD = tetrachlorodibenzo-*p*-dioxin; TEF = toxic equivalency factor; TWA = time-weighted average; WHO = World Health Organization