

7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding 1,2-dichloroethene in air, water, and other media are summarized in Table 7-1.

ATSDR has derived an MRL of 0.2 ppm for both acute-duration inhalation exposure (14 days or less) and intermediate-duration inhalation exposure (15-365 days) to trans- 1,2-dichloroethene based on a study by Freundt et al. (1977) that found fatty degeneration of the liver. The acute MRL is based on an LOAEL of 200 ppm over an 8-hour period, and the intermediate MRL is based on an LOAEL of 200 ppm for 8 hours per day, 5 days per week for 8 or 16 weeks.

ATSDR has derived oral MRLs for both acute- and intermediate-duration exposure. For acute oral exposure, data supported the derivation of an MRL for cis-1,2-dichloroethene of 1 mg/kg/day; however, no acute-duration MRL was derived for trans-1,2-dichloroethene. The acute oral MRL for cis-1,2-dichloroethene is based on a study by McCauley et al. (1990) that found hematological effects at 290 mg/kg/day and reported a NOAEL of 97 mg/kg/day.

Intermediate-duration oral exposure MRLs were derived for both the cis and trans isomers. The intermediate duration oral MRL for cis-1,2-dichloroethene is 0.3 mg/kg/day based on a hematological study (McCauley et al. 1990). For trans-1,2-dichloroethene, the intermediate oral MRL is 0.2 mg/kg/day, based on hepatic effects (Barnes et al. 1985).

EPA has given cis-1,2-dichloroethene a non-cancer rating or a “not classifiable” rating (D) (IRIS 1995). No National Toxicology Program (NTP) or IARC classifications exists.

OSHA requires employers of workers who are occupationally exposed to a mixture of trans- and cis-1,2-dichloroethene (CAS No. 540-59-0) to institute engineering controls and work practices to reduce exposure-to and maintain employee exposure at or below permissible exposure limits (PEL). The employer must use engineering and work practice controls, if feasible, to reduce exposure to or below an 8-hour time-weighted average (TWA) of 200 ppm (790 mg/m³). Respirators must be provided during the time period necessary to install or implement feasible engineering and work practice controls (OSHA 1989).

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1,2-Dichloroethene is regulated by the Clean Water Effluent Guidelines as stated in Title 40, Section 400-475, of the Code of Federal Regulations. The point source category for which 1,2-dichloroethene is controlled as a Total Toxic Organic is electroplating (EPA 1981).

The Resource Conservation and Recovery Act (RCRA) identifies 1,2-dichloroethene as a hazardous waste when it is discarded as a commercial chemical product, off-spec species, container residue, or spill residue (EPA 1980a).

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene

Agency	Description	Information		Reference
		trans	cis	
<u>INTERNATIONAL</u>				
WHO		NAp	NAp	
IARC	Group (cancer ranking)	None	None	
<u>NATIONAL</u>				
Regulations:				
a. Water:				
EPA/OW	Ambient Water Quality Criterion	1.16x10 ⁺⁴ µg/L (aquatic organisms)	3.3x10 ⁻² µg/L (human health)	IRIS 1995 45 FR 79318 (11/28/80)
	Method 601-Purgeable Halocarbons	Yes	NAp	40 CFR 136 EPA 1973
	Method 624-Purgeables	Yes	NAp	40 CFR 136 EPA 1973
	Method 1624 Revision B - Volatile Organic Compounds by Isotope Dilution GC/MS	Yes	NAp	40 CFR 136 EPA 1973
	Hazardous Waste Injection Restrictions (Proposed rule)	Yes	NAp	40 CFR 148 60 FR 11702 EPA 1995
EPA-ODW	Public Notification	Yes	NAp	40 CFR 141.32 EPA 1975a
	Maximum Contaminant Levels for Organic Contaminants	0.1 mg/L	0.1 mg/L	40 CFR 141.61 EPA 1975a
b. Other:				
CPSC	Consumer product limits	Nap	NAp	
EPA/OERR	Reportable Quantity	1,000 lb.	NAp	40 CFR 302.4 EPA 1985
EPA/OSW	Municipal Solid Waste Landfills: Appendix I - Constituents for Detection Monitoring	Yes	Yes	40 CFR 258 EPA 1991
	Municipal Solid Waste Landfills: Appendix II - List of Hazardous Inorganic and Organic Constituents	0.5-5 µg/L (Practical Quantitation Limits for 3 Methods)	same	40 CFR 258 EPA 1991
	Discarded Commercial Chemical Products, Off-specification Species, Container Residues, and Spill Residues Thereof	Yes	NAp	40 CFR 261.33 EPA 1980a
	Identification and Listing of Hazardous Wastes: Appendix VIII - Hazardous Constituents	Yes	NAp	40 CFR 261 EPA 1980a
	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities: Appendix IX - Ground- water Monitoring List	1-5 µg/L (Practical Quantitation Limits for 2 Methods)	NAp	40 CFR 264 EPA 1980

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene (continued)

Agency	Description	Information		Reference
		trans	cis	
<u>NATIONAL</u> (cont.)				
	Treatment Standards - Applicability	Yes	Nap	40 CFR 268.40 EPA 1987
	Treatment Standards Expressed as Waste Concentrations	0.054 mg/L (waste waters); 33 mg/kg (non-waste waters)	NAp	40 CFR 268.43 EPA 1988
	Land Disposal Restrictions: Appendix III - List of Halogenated Organic Compounds Regulated Under 268.32	Yes	NAp	40 CFR 268 EPA 1986
	Universal Treatment Standards (proposed)	0.054 mg/L	Nap	40 CFR 268.48 EPA 1995b 60 FR 242
Guidelines:				
a. Air:				
ACGIH	Ceiling Limit for Occupational Exposure (TLV-TWA)	200 ppm (790 mg/m ³) (CAS No. 540-59-0)		ACGIH 1994
NIOSH	Recommended Exposure Limit for Occupational exposure (TWA)	200 ppm (790 mg/m ³) TWA (CAS No. 540-59-0)		NIOSH 1992
b. Water:				
EPA	1-d Health Advisory	20 mg/L (child)	4 mg/L (child)	EPA 1995c
	10-d Health Advisory	2 mg/L (child)	3 mg/L (child)	EPA 1995c
	Lifetime Health Advisory	0.1 mg/L (adult)	0.07 mg/L (adult)	EPA 1995c
	Longer-term Health Advisory	6 mg/L (adult) 2 mg/L (child)	11 mg/L (adult) 3 mg/L (child)	EPA 1995c
	Maximum Contaminant Level	0.1 mg/L	0.07 mg/L	EPA 1995c
	Maximum Contaminant Level Guideline	0.1 mg/L	0.07 mg/L	EPA 1995c
c. Other:				
EPA	Cancer classification	None	D ^a	IRIS 1995
NTP	Cancer classification	None	None	

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene (continued)

Agency	Description	Information		Reference
		trans	cis	
<u>STATE</u>				
Regulations and Guidelines				
a. Air:				
	Acceptable Ambient Air Concentration Guidelines or Standards ^b			NATICH 1992
AZ	1 hr avg. time		$2.38 \times 10^{+4}$ $\mu\text{g}/\text{m}^3$ (6.00 ppm)	
	24 hr avg. time		$6.30 \times 10^{+3}$ $\mu\text{g}/\text{m}^3$ (1.60 ppm)	
CT	8 hr avg. time	$1.58 \times 10^{+4}$ $\mu\text{g}/\text{m}^3$ (3.99 ppm)		
FL-PINELLA	8 hr avg. time	$2.90 \times 10^{+3}$ $\mu\text{g}/\text{m}^3$ (0.731 ppm)		
	24 hr avg. time	$6.96 \times 10^{+2}$ $\mu\text{g}/\text{m}^3$ (0.176 ppm)		
MA	24 hr avg. time	$2.16 \times 10^{+2}$ $\mu\text{g}/\text{m}^3$ (0.054 ppm)		
	Annual avg. time	$1.08 \times 10^{+2}$ $\mu\text{g}/\text{m}^3$ (0.027 ppm)		
ND	8 hr avg. time	7.93 mg/m ³ (2.00 ppm)		
NV	8 hr avg. time	$1.88 \times 10^{+1}$ mg/m ³ (4.74 ppm)		
NY	Annual avg. Time	3.6×10^2 $\mu\text{g}/\text{m}^3$ (0.091 ppm)	1.9×10^3 $\mu\text{g}/\text{m}^3$ (0.479 ppm)	Sittig 1994
OK	24 hr avg. time	$7.93 \times 10^{+4}$ $\mu\text{g}/\text{m}^3$ (20.00 ppm)		NATICH 1992
TX	30 min avg. time	$7.93 \times 10^{+3}$ $\mu\text{g}/\text{m}^3$ (2.00 ppm)		

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene (continued)

Agency	Description	Information		Reference
		trans	cis	
<u>STATE</u> (Cont.)				
	Annual avg. time	7.90x10 ⁺² μg/m ³ (0.199 ppm)		
	30 min avg. time		7.90x10 ⁺³ μg/m ³ (2.00 ppm)	
	Annual avg. time		7.90x10 ⁺² μg/m ³ (0.199 ppm)	
VA	24 hr avg. time	1.30x10 ⁺⁴ μg/m ³ (3.28 ppm)		
VT	8 hr avg. time	7.90x10 ⁺⁴ μg/m ³ (19.93 ppm)		
WA-SWEST	24 hr avg. time	2.63x10 ⁺³ μg/m ³ (0.663 ppm)		
b. Water:				
	Water Quality: Human Health			CELDs 1993
AZ	Domestic water source	100 μg/L	70 μg/L	
	Fish consumption	13,000 μg/L		
CA	Drinking water guideline	10 μg/L	6 μg/L	FSTRAC 1990
CT	Listed but no values			CELDs 1993
DE	Freshwater fish ingestion only	130.0 mg/L		
	Freshwater fish & water ingestion	700 μg/L		
	Marine, estuarine fish/shellfish ingestion	19.0 mg/L		
FL	Domestic/Drinking water	100 μg/L	70 μg/L	Sittig 1994
KS	Drinking water guideline	70 μg/L	70 μg/L	FSTRAC 1990
MA	Drinking water guideline	70 μg/L	70 μg/L	
ME	Drinking water guideline	70 μg/L	70 μg/L	
MI	Domestic/Drinking water	120 μg/L	77 μg/L	Sittig 1994
MN	Drinking water guideline	70 μg/L	70 μg/L	FSTRAC 1990

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene (continued)

Agency	Description	Information		Reference
		trans	cis	
<u>STATE (Cont.)</u>				
MO	Fish consumption	140,000 µg/L		CELDs 1993
	Drinking water supply	700 µg/L		
NH	Drinking water guideline	100 µg/L	70 µg/L	FSTRAC 1990
NJ	Drinking water standard: generic	100 µg/L	10 µg/L	Sittig 1994
NY	Domestic/Drinking water	5 µg/L		
OR	Generic: Water & fish ingestion	0.033 µg/L		CELDs 1993
	Domestic/Drinking water	100 µg/L	70 µg/L	Sittig 1994
	Fish consumption only	1.85 µg/L		CELDs 1993
RI	Drinking water guideline	70 µg/L		FSTRAC 1990
TN	Domestic/Drinking water	100 µg/L	70 µg/L	Sittig 1994
TX	Domestic/Drinking water		70 µg/L	
VT	Drinking water guideline: generic	70 µg/L		FSTRAC 1990
WI	Drinking water guideline	100 µg/L	100 µg/L	
	Water Quality: Aquatic			CELDs 1993
AL	Listed but no value			
AZ	Acute-cold water fishery	68,000 µg/L		
	Acute-warm water fishery	68,000 µg/L		
	Acute-effluent dominated water	68,000 µg/L		
	Chronic-cold water fishery	3,900 µg/L		
	Chronic-warm water fishery	3,900 µg/L		
	Chronic-effluent dominated water	3,900 µg/L		
NJ	Generic "Dichloroethylenes" (1,2 dce listed as subset but no value) - Acute-freshwater (max)	11,600		
	Acute-saltwater (max)	224,000		
OH	Exceptional modified, & seasonal warm water; outside mixing zone; max	7000 µg/L		
	Exceptional modified, & seasonal warm water; outside mixing zone; max; 30-d avg.	310 µg/L		
	Exceptional modified, & seasonal warm water; outside mixing zone; inside mixing zone; maximum	14,000 µg/L		

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene (continued)

Agency	Description	Information		Reference
		trans	cis	
<u>STATE (Cont.)</u>				
	Cold water & limited resource warmwater; outside mixing zone; maximum	7,000 µg/L		
	Coldwater & limited resource warmwater; 30-d avg.	310 µg/L		
	Cold water & limited resource warmwater; inside mixing zone; max	14,000 µg/L		
OR	Generic: Acute-freshwater	11,600 µg/L		
	Acute-marine	224,000µg/L		
	Water Quality: Recreational Use			CELDs 1993
AZ	Full body contact	2,800 µg/L		
	Partial body contact	2,800 µg/L		
	Groundwater Quality Standards			CELDs 1993
MO		700 µg/L		
NC	Class GS		0.07 mg/L	
	Class GS	0.07 mg/L		
WI	Enforcement standard		100 µg/L	
	Preventive action limit		10 µg/L	
	Enforcement standard	100 µg/L		
	Preventive action limit	20 µg/L		
	Groundwater Monitoring Parameter			CELDs 1993
CO	Generic	Yes		
IL		Yes		
LA		Yes		
MN		Yes		
VA		Yes		
WI		Yes		
	MCLG's = MCLs or Action Levels			
WI		0.1 mg/L	0.07 mg/L	
SD	Surfacewater Discharge Permit Application Requirements: Testing Requirements for Organic Toxic Pollutants	Yes		
NJ	NPDES Permits: Testing Requirements for Organic Toxic Pollutants	Yes		

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Table 7-1. Regulations and Guidelines Applicable to trans- and cis-1,2-Dichloroethene (continued)

Agency	Description	Information		Reference
		trans	cis	
<u>STATE</u> (Cont.)				
WI	Toxic Discharge	Yes		
c. Other:				
	Hazardous Waste			CELDs 1993
CO		Yes (LDR)		
IL		Yes		
	Generic	Yes		
LA		Yes		
MA		Yes (LDR)		
	Hazardous Waste Constituents			CELDs 1993
CO		Yes		
IL		Yes		
LA		Yes		
	Generic	Yes		
	Generic	Yes		
MN	Generic	Yes		
ND	Generic	Yes		
WV	Generic	Yes (App. VIII)		
WI	Generic	Yes (App. IV)		

NOTE: Update of drinking water guidelines and other areas in progress.
Units in table reflect values and units of measure designated by each agency in its regulations or advisories.

^a Not classifiable as to human carcinogenicity

^b Additional Guidelines or Standards for a mixture of cis- and trans-1,2-dichloroethene (CAS No. 540-59-0)

ACGIH = American Conference of Governmental and Industrial Hygienists; CAS = Chemical Abstracts Services; CELDs = Computer-aided Environmental Legislative Database; CFR = Code of Federal Regulations; CPSC = Consumer Product Safety Commission; EPA = Environmental Protection Agency; FR = Federal Register; FSTRAC = Federal State Toxicology and Regulatory Alliance Committee; GC/MS = Gas Chromatography/Mass Spectrometry; IARC = International Agency for Research on Cancer; IRIS = Integrated Risk Information System; LDR = Land Disposal Restrictions; MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; NA = Not available at the present time; NAp = Not applicable; NATICH = National Air Toxics Information Clearinghouse; NIOSH = National Institute of Occupational Safety and Health; NPDES = National Pollutant Discharge Elimination System; ODW = Office of Drinking Water; OERR = Office of Emergency and Remedial Response; OSW = Office of Solid Waste; OW = Office of Water; TLV = Threshold Limit Value; TWA = Time Weighted Average; WHO = World Health Organization

