

7. REGULATIONS AND ADVISORIES

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

An MRL of 0.01 mg/kg/day has been derived for acute-duration oral exposure (14 days or less) to 2,4-DNP, based on a LOAEL of 1.2 mg/kg/day identified in humans who took 2,4-DNP for weight reduction (Tainter et al. 1935b).

EPA has verified a chronic RfD of 0.002 mg/kg/day for 2,4-DNP based on a LOAEL value for intermediate-duration exposure of 2 mg/kg/day for cataracts from a review by Horner (1942) of the anecdotal cases and clinical studies of patients taking this drug for weight reduction (IRIS 1994). No reference concentration exists for exposure by inhalation to 2,4-DNP.

2,4-DNP is on the list of chemicals appearing in “The Emergency Planning and Community Right-to-Know Act of 1986” (EPCRA) (EPA 1988b). Section 313 of Title III of EPCRA requires owners and operators of certain facilities that manufacture, import, process, or otherwise use the chemicals on this list to report annually their release of those chemicals to any environmental media.

2,4-DNP is regulated by the Clean Water Effluent Guidelines as stated in Title 40, Sections 400-475, of the Code of Federal Regulations. The point source categories for which 2,4-DNP is controlled as a Total Toxic Organic include electroplating, metal finishing, and steam electric power generation.

The Resource Conservation and Recovery Act identifies dinitrophenols as a hazardous waste in two ways: (1) when it occurs as a waste from specific sources (EPA 1981a), and (2) when discarded as a commercial product that does not meet specifications, container residue, or spill residue (EPA 1980a).

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols

Agency	Description	Information	Reference
NATIONAL			
Regulations:			
a. Air:			
EPA	Listed as Hazardous Air Pollutant (2,4-dinitrophenol)	Yes	U.S. Congress 1990 (Clean Air Act Amendments)
EPA OAQPS	Standards of Performance for Equipment Leaks of VOC in the SOCMI: List of Chemicals Produced by Affected Facilities	Yes	40 CFR 60.489 EPA 1983a
	Approval and promulgation of implementation plans	Yes	40 CFR 52 EPA 1972
	Hazardous Air Pollutants: Proposed Regulations Governing Constructed, Reconstructed, or Modified Major Sources	Yes	59 FR 15504—Proposed EPA 1994
b. Water:			
EPA OW	Designation of Hazardous Substance (2,5-dinitrophenol and 2,4-dinitrophenol)	Yes	40 CFR 116.4 EPA 1978
	Reportable Quantities of Hazardous Substances: Section 311 of the Clean Water Act (dinitrophenol)	10 lb (4.54 kg)	40 CFR 117.3 EPA 1979a
	Form 2D (dinitrophenol)	Yes	40 CFR 122 EPA 1983b
	Appendix D—NPDES Permit Application Testing Requirements (122.21) (2,4-dinitrophenol)	Yes	40 CFR 122 EPA 1983b
	Additional Conditions Applicable to Specified Categories of NPDES Permits	500 µg/L	40 CFR 122.42 EPA 1983c
	Instructions—Form 2C (dinitrophenols)	NA	40 CFR 125 EPA 1979b
	Method 604—Phenols (2,4-dinitrophenol)	Yes	40 CFR 136 EPA 1973
	Method 625—Base/Neutrals and Acids (2,4-dinitrophenol)	Yes	40 CFR 136 EPA 1973
	Method 1625 Revision B—Semivolatile Organic Compounds by Isotope Dilution GC/MS (2,4-dinitrophenol)	Yes	40 CFR 136 EPA 1973
	Effluent Guidelines and Standards: Toxic Pollutants (2,4-dinitrophenol)	Yes	40 CFR 401.15 EPA 1979c

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols (continued)

Agency	Description	Information	Reference
<u>NATIONAL</u> (cont.)			
EPA OW	Pretreatment Regulations: Appendix B— 65 Toxic Pollutants (2,4-dinitrophenol)	Yes	40 CFR 403 EPA 1986b
	Effluent Guidelines and Standards: Electroplating— Definition of Total Toxic Organic (2,4-dinitrophenol)	Yes	40 CFR 413.02 EPA 1981a
	Toxic Pollutant Effluent Limitation and Standards for Direct Discharge Point Sources That Can Use End-of- pipe Biological Treatment		40 CFR 414.91 EPA 1987b
	- Maximum for any one day - Maximum for monthly average (2,4-dinitrophenol)	123 µg/L 71 µg/L	
	Toxic Pollutant Effluent Limitation and Standards for Direct Discharge Point Sources That Do Not Use End- of-pipe Biological Treatment		40 CFR 414.101 EPA 1987c
	- Maximum for any one day - Maximum for monthly average (2,4-dinitrophenol)	4,291 µg/L 1,207 µg/L	
	Effluent Guidelines and Standards: Steam Electric Power Generation: Appendix A—126 Priority Pollutants (2,4-dinitrophenol)	Yes	40 CFR 423 EPA 1982b
	Effluent Guidelines and Standards: Metal/finishing— Definition of Total Toxic Organic (2,4-dinitrophenol)	>0.01 mg/L	40 CFR 433.11 EPA 1983d
c. Other EPA OERR	Pesticide Chemicals Category: Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards	Yes	40 CFR 455 EPA 1990a
	Reportable Quantity (dinitrophenol and 2,4-dinitrophenol)	10 lb (4.54 kg)	40 CFR 302.4 EPA 1985
	Toxic Chemical Release Reporting: Community Right-to-Know-Specific (2,4-dinitrophenol)	Yes	40 CFR 372.65 EPA 1988b
EPA OPTS	Reportable Quantity Adjustments	Yes	58 FR 54836—Proposed EPA 1993a
	Removed from List "B" Pesticides		54 FR 22706 EPA 1990b
	Intent to Cancel, Restrict, or Require Reregistration of Pesticide Products Containing Dinitrophenols (2,4-dinitrophenol)	Yes	EPA 1992d
	Chemical Information Rules: Chemical Lists and Reporting Periods	Yes	40 CFR 712.30 EPA 1982c

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols (continued)

Agency	Description	Information	Reference
<u>NATIONAL</u> (cont.)			
EPA OPTS	Health and Safety Data Reporting: Substances and Listed Mixtures to Which This Subpart Applies	Yes	40 CFR 716.120 EPA 1988d
EPA OSW	Appendix II—Municipal Solid Waste Landfills (2,4-dinitrophenol) Method 8040 Method 8270	150 µg/L 50 µg/L (Practical Quantitation Limit)	40 CFR 258 EPA 1991b
	Listing as Hazardous Waste: K001 - Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use cresosote and/or pentachlorophenol.	Yes	40 CFR 261.33e EPA 1980a
	P048 - Discarded Commercial Chemical Products Off-specification Species, Container Residues, and Spill Residues Thereof		
	Appendix VIII—Listing as Hazardous Waste Constituent (P048)	Yes	40 CFR 261 EPA 1980b
	Appendix VII—Basis for Listing Hazardous Waste (2,4-dinitrophenol)	Yes	40 CFR 261 EPA 1981b
	Appendix IX—Wastes Excluded Under §260.20 and §260.22. Delisting Level (2,4-dinitrophenol)	89.6 ppm	40 CFR 261 EPA 1984b
	Appendix IX—Groundwater Monitoring Requirement	Yes	40 CFR 264 EPA 1987d
	Constituent Concentrations in Waste: Waste Water Concentration Nonwaste Water	0.12 mg/L 160 mg/kg	40 CFR 268.43 EPA 1988c
	Land Disposal Restriction: Applicability of Treatment Standards	Yes	58 FR 48158—Proposed EPA 1993b
Guidelines:			
a. Water			
EPA OWRS	Ambient Water Quality Criteria for Protection of Human Health: (2,4-dinitrophenol) Ingesting water and fish Ingesting fish only (EPA is considering changing fish consumption criterion to 14.3 µg/L)	70 µg/L 765 µg/L	45 FR 79318 EPA 1980c IRIS 1994
EPA ODW	Drinking Water Priority List	Yes	56 FR 1470 EPA 1991c
b. Other			
EPA	RfD (oral) (2,4-dinitrophenol)	0.002 mg/kg/day	IRIS 1994

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols (continued)

Agency	Description	Information	Reference
<u>NATIONAL</u> (cont.)			
	Aquatic Organisms:		45 FR 79318 EPA 1980c
EPA	Acute-freshwater	2.3×10^2 $\mu\text{g/L}$ (LEC)	
	Acute-marine	4.85×10^3 $\mu\text{g/L}$ (LEC)	
	Chronic-freshwater	1.5×10^2 $\mu\text{g/L}$ (LEC)	
NAS NRC	SNARL—Chronic Exposure	0.11 mg/L (avg.)	NAS/NRC 1982
<u>STATE</u>			
Regulations and Guidelines:			NATICH 1992
a. Air:	Acceptable Ambient Air Concentration Guidelines or Standards		
AZ	(2,4-dinitrophenol)	$6 \mu\text{g/m}^3$ (1 hr) $1.6 \mu\text{g/m}^3$ (24 hr)	
FL- Pinella	(dinitrophenol)	$2 \mu\text{g/m}^3$ (annual)	
TX	(dinitrophenol)	$3 \mu\text{g/m}^3$ (30 min) $0.3 \mu\text{g/m}^3$ (annual)	
WI	Toxic pollutant regulated as a class (acid extract compounds)	Yes	CELDs 1992
b. Water			FSTRAC 1990
	Water Quality: Human Health		CELDs 1994
AL	(2,4-dinitrophenol)	Not available	
AZ	(2,4-dinitrophenol) Domestic water source Fish consumption Full body contact Partial body contact	$14 \mu\text{g/L}$ $5,400 \mu\text{g/L}$ $280 \mu\text{g/L}$ $280 \mu\text{g/L}$	
CA	30-day average (2,4-dinitrophenol)	$4.0 \mu\text{g/L}$	
CT	(2,4-dinitrophenol) Fish consumption Fish and water consumption	$14,000^a$ 70^a	

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols (continued)

Agency	Description	Information	Reference
<u>STATE</u> (cont.)			
DE	(2,4-dinitrophenol) Freshwater fish consumption Fresh-fish and water consumption Marine/estuarine fish and shellfish consumption	130 mg/L 70 µg/L 1.9 mg/L	
DC	(nitrophenols) Raw public water supply	13 ^a	
FL	Unregulated contaminants Analyses performed every 36 months for dinitrophenol in community water supply	Yes	CELDs 1992
IN	(dinitrophenol) Outside mixing zone (4-day avg.) Point of water intake (4-day avg.) Domestic water supply source	14,300 µg/L 70 µg/L 0.070 mg/L	
KS	Drinking water	110 µg/L (2,4)	FSTRAC 1990
KY	Fish consumption (dinitrophenol)	14,300 µg/L	
ME	Drinking water	31 µg/L (2,4)	FSTRAC 1990
MO	(2,4-dinitrophenol) Fish consumption Drinking water supply	14,000 µg/L 70 µg/L	
NJ	24-hour maximum—potable water (dinitrophenol)	70µg/L	
OH	Outside mixing zone (30-day avg.) (2,4-dinitrophenol)	14,300 µg/L	
SD	(2,4-dinitrophenol) Domestic water All other uses	70 µg/L 14,300 µg/L	
TN	All categories (2,4-dinitrophenol)	14,000 µg/L	
VT	(2,4-dinitrophenol) Class A or B waters Class C waters	70 µg/L 14.3 µg/L	
AZ	Water Quality: Aquatic Life (2,4-dinitrophenol) Acute-cold water fishery Acute-warm water fishery Acute-effluent dominated water Chronic-cold water fishery Chronic-warm water fishery Chronic-effluent dominated water	 110 µg/L 110 µg/L 110 µg/L 9.2 µg/L 9.2 µg/L 9.2 µg/L	

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols (continued)

Agency	Description	Information	Reference
<u>STATE</u> (cont.)			
DC	Aquatic life (nitrophenols)	20 ^a	
HI	(nitrophenols)		
	Acute-freshwater	77 µg/L	
	Acute-saltwater	1,600 µg/L	
NJ	(nitrophenols)		
	24-hour maximum - freshwater	230 ^a	
	24-hour maximum - saltwater	4,850 µg/L	
OK	(nitrophenols)		
	Acute-freshwater	230 ^a	
	Chronic-freshwater	150 ^a	
	Acute-marine	4,850 µg/L	
	Water Quality: Agricultural Uses		CELDs 1994
MO	Irrigation (2,4-dinitrophenol)	70 µg/L	
OH	(2,4-dinitrophenol)	70 µg/L	
	Water Quality: Recreational Uses		CELDs 1994
TN		14,000 µg/L	
	Groundwater Quality Standards		CELDs 1994
MO	(2,4-dinitrophenol)	70 µg/L	
	Groundwater Quality Monitoring Parameters (2,4-dinitrophenols)		CELDs 1994
CO		Yes	
IL		Yes	
LA		Yes	
MN		Yes	
WV		Yes	
WI		Yes	
	Discharge Limits		CELDs 1994
NJ	NPDES Permits: Testing Requirements for Organic Pollutants (2,4-dinitrophenol)	Yes	

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Table 7-1. Regulations and Guidelines Applicable to Dinitrophenols (continued)

Agency	Description	Information	Reference
<u>STATE</u> (cont.)			
SD	Surface Water Discharge Permit Application Requirements: Test Requirements for Organic Toxic Pollutants (2,4-dinitrophenol)	Yes	
WI	Maximum allowable concentrations=BAT effluent	Yes	
c. Other			
	Hazardous Waste Constituents (2,4-dinitrophenol)		CELDs 1994
CA		Yes	
CO		Yes	
IL		Yes	
LA		Yes	
MA		Yes	
MN		Yes	
ND		Yes	
NH		Yes	
WV		Yes	
WI		Yes	
	Restricted Pesticides		
CA	(2,4-dinitrophenol)	Yes	CELDs 1994
OR	Designated highly toxic pesticide (provisions for sale, use, and manufacture)	Yes	CELDs 1992

^a Unit of measure was not provided in CELDs; however, it is believed all missing units are in µg/L.

BAT = Best Available Technology; EPA = Environmental Protection Agency; GC/MS = Gas Chromatogram/Mass Spectrometry; LEC = Lowest Effect Level in literature (due to inadequate data to derive a criterion); NAS/NRC = National Academy of Sciences/National Research Council; NPDES = National Pollutant Discharge Elimination System; OERR = Office of Emergency and Remedial Response; OPTS = Office of Pesticides and Toxic Substances; OSW = Office of Solid Waste; OWRS = Office of Water Regulations and Standards; RfD = Reference Dose; SNARL = Suggested No Adverse Response Level; SOCMI = Synthetic Organic Chemical Manufacturing Industry; VOC = volatile organic chemical