7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding total petroleum hydrocarbons (TPH) in air, water, and other media are summarized in Table 7-1. No health or environmental benchmarks have been developed for TPH as a general category, though many exist for individual petroleum chemicals or products, such as gasoline.

Benzene is on the list of chemicals in "The Emergency Planning and Community Right-to-Know Act of 1986" (EPA 1988c, 1989c, 1989d). Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) requires owners and operators of certain facilities that manufacture, import, process, or otherwise use the chemicals on this list to report annually any release of those chemicals to any environmental media over a specified threshold level.

OSHA requires employers of workers who are occupationally exposed to petroleum distillates to institute engineering controls and work practices to reduce and maintain employee exposure at or below permissible exposure limits (PEL). The PEL for petroleum distillates is 500 ppm (OSHA 1974).

TPH as oil is regulated by the Clean Water Act as stated in Title 40, Sections 109-l 14 and Section 112 of the Code of Federal Regulations. Sections 109-l14 address oil pollution prevention and spill response. Section 112 pertains to stormwater discharge permitting under the National Pollutant Discharge Elimination System. Underground injection control is regulated according to 40 CFR Sections 144 and 146.

Under Subtitle C of the Resource Conservation and Recovery Act (RCRA), certain wastes containing designated TPH compounds and petroleum-related industrial wastes are listed as hazardous. However, RCRA excludes some TPH-related wastes from regulations (e.g., certain exploration, well development, and productions wastes). The RCRA-listed wastes are also controlled under the Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) for accidental releases to the environment.

The American Society for Testing and Materials (ASTM) developed a guide for the community of engineering firms, environmental and risk assessment scientists, and governmental agencies to deal with

petroleum contaminated sites. In 1995 ASTM published its *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* partly in response to Subtitle I of the Resource Conservation and Recovery Act (RCRA) (ASTM 1995). RCRA directed the U.S. Environmental Protection Agency (EPA) establish programs to prevent, detect, and clean up releases from underground storage tank systems (UST). ASTM's risk-based corrective action (RBCA) is a widely used, decision-making process for the assessment and response to chemical releases, with particular emphasis on petroleum release, based on the protection of human health and the environment. RBCA integrates site assessment, remedial action selection, and monitoring with risk and exposure assessment practices suggested by the EPA. The RBCA process is implemented in a tiered approach that involves increasingly sophisticated levels of data collection and analysis. Site assessment is followed by site classification whereby sites are classified by the urgency of initial response action based on information collected during the site assessment. Section 5.3.3.3, Transport Models, in Chapter 5 presents a brief overview of the tiered RBCA approach and also provides the basic flow chart of the RBCA approach, Figure 5-2.

Table 7-1. Regulations and Guidelines Applicable to Total Petroleum Hydrocarbons

Agency	Description	Information[a]	References
INTERNATIONAL			
WHO	NA		
International Convention for Prevention of Pollution from Ships (MARPOL)	1978 Protocol: Annexes I-V-Oil, Noxious Liquids, etc	Yes	MARPOL 1978
NATIONAL			
Regulations: a. Water:			
EPA OW	Oil Pollution Prevention (spill prevention control and counter-measure planning)	Yes	40 CFR 112 EPA 1973a
	Criteria for State, Local and Regional Oil Removal Contingency Plans	Yes	40 CFR 109 EPA 1971
	Discharge of Oil	Yes	40 CFR 110 EPA 1987
	Liability Limits for Small Onshore Storage Facilities	Yes	40 CFR 113 EPA 1973b
	Civil Penalties for Violation of Oil Pollution Prevention Regulations	Yes	40 CFR 114 EPA 1974
	National Pollutant Discharge Elimination Permit Application: General Permits	Yes	40 CFR 122.28 EPA 1983a
	Stormwater Discharges	Yes	40 CFR 122.26 EPA 1990a
	Procedures for [Permit] Decision-making: Fact sheet for Stormwater Discharge Associated with Industrial Activities (Notice: e.g., asphalt paving and roofing, oil and gas exaction, hazardous waste TSDFs, landfills/application sites)	Yes	58 FR 61146 EPA 1993
EPA-ODW	Underground Injection Control Criteria and Standards for Program: Criteria and Standards for Class II Wells (oil and gas-related)		40 CFR 144 EPA 1983b
	Underground Injection Control Criteria and Standards for Program: Criteria and Standards for Class II Wells (oil and gas-related)	Yes	40 CFR 146, Subpart C EPA 1980a
Bureau of Land Mgt.	Onshore Oil and Gas Operations: Environment and Safety		43 CFR 3160

Table 7-1. Regulations and Guidelines Applicable to Total Petroleum Hydrocarbons (continued)

Agency	Description	Information[a]	References
NATIONAL (cont.)			
b. Other			
DOT	Table of Hazardous Materials and Special Provisions: Gasoline, Petroleum, Crude Oil, Petroleum Distillates, n.o.s., Petroleum Ether, Petroleum Gases, Petroleum Naphtha, Petroleum Oil, Petroleum Spirit, Hydro-carbon Gases	Yes	49 CFR 172.101 DOT 1990
EPA OPPT	PCB Manufacturing, Processing, Distribution in Commerce and Use Prohibition - Disposal Requirements: Incineration	≥50 ppm	40 CFR 761.60 EPA 1979b
EPA OSW	Criteria for Municipal Solid Waste Landfills	Yes	40 CFR 258 EPA 1991a
	Definition of Used Oil	Yes	40 CFR 260.10 EPA 1980b
	Definition of Solid Waste	Yes	40 CFR 261.2 EPA 1985a
	Identification and Listing of Hazardous Waste: Definition of Hazardous Waste: Rebuttable Presumption of Used Oil Total Halogens Deeming Oil Hazardous	Yes	40 CFR 261.3 EPA 1998c
	Exclusions Drilling Fluids, Produced Waters, Etc., Associated with Exploration, Development, or Production	Yes	40 CFR 261.4(b) EPA 1980c
	Petroleum-contaminated Media and Debris Failing Toxicity Characteristic and Subject to Corrective Action	Yes	
	Non-terne plated Used Oil Filters	Yes	
	Requirements for Recyclable Materials - Exclusions (see 40 CFR 266)	Yes	40 CFR 261.6 EPA 1985b
	Toxicity Characteristic Benzene Lead	 0.5 mg/L (0.5 ppm) 5.0 mg/L (5.0 ppm)	40 CFR 261.6 EPA 1990b

Table 7-1. Regulations and Guidelines Applicable to Total Petroleum Hydrocarbons (continued)

Agency	Description	Information[a]	References
NATIONAL (cont.)			
	Hazardous Wastes from Non-specific Sources: Petroleum Refinery Primary and Secondary Oil/Water/Solids Separation Sludges (F037, F038)	Yes	40 CFR 261.31 EPA 1981a
	Hazardous Wastes from Specific Sources: Petroleum Refining Wastes		
	K048 - K052	Yes	40 CFR 261.32 EPA 1981b
	K170 - K172 (proposed)	Yes	60 FR 57747 EPA 1995b
	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities: Hazardous Waste Burned in Boilers and Industrial Furnaces		40 CFR 266.104
	Destruction and Removal Efficiency for All Organic Hazardous Constituents	99.99%	EPA 1991a
	Low Risk Waste Exemption	50% of fuel is fossil fuel	40 CFR 266.109 EPA 1991a
	Land Disposal Restrictions: Treatment Standards (numerous constituents)		
	F037 - F038	Yes	40 CFR 268.40 EPA 1988c
	K048 - K052	Yes	
	K170 - K172 (proposed)	Yes	40 FR 57747 EPA 1995b
	Standards for the Management of Used Oil	Yes	57 FR 41566 EPA 1992b
	Underground Storage Tank Standards	Yes	40 CFR 280 EPA 1988b
	Release Response and Corrective Action for US Systems Containing Petroleum or Hazardous Substances	Yes	
EPA OSWER	Designation, Reportable Quantities and Notification		
	F037 - F038	1 lb. each	40 CFR 302.4 EPA 1985c
	K048 - K052	10 lb. each	
	K170 - K172 (proposed)	100 lb. each	60 FR 57747 EPA 1995b

Table 7-1. Regulations and Guidelines Applicable to Total Petroleum Hydrocarbons (continued)

Agency	Description	Information[a]	References
NATIONAL (cont.)			
OSHA	Limits for Air Contaminants - Petroleum Distillates	2,000 mg/m^3 (500 ppm)	29 CFR 1910.1000 OSHA 1974
Guidelines			ACGIH 1994
a. Air:			
ACGIH	Threshold Limit Values	890 mg/m^3	
	Gasoline	(300 ppm)	
	TWA	1,480 mg/m^3 (500 ppm)	
	STEL		
NIOSH	Gasoline -		NIOSH 1992
	LOQ	15 ppm	
	CA		
b. Other:			
EPA	RfC (inhalation)		IRIS 1998b
	Ethylbenzene	1 mg/m^3 (0.2303 ppm)	
	Cumene	0.4 mg/m^3 (0.1134 ppm)	
	Naphthalene	0.003 mg/m^3 (0.00069 ppm)	
	n-Hexane	0.2 mg/m^3 (0.0567 ppm)	
	Toluene	0.4 mg/m^3 (0.1062 ppm)	
	RfD (oral)		
	Cumene	0.1 mg/kg/day	
	n-Hexane	0.06 mg/kg/day	
	Naphthalene	0.02 mg/kg/day	
	Ethylbenzene	0.1 mg/kg/day	
	Anthracene	0.3 mg/kg/day	
	Ancenaphthene	0.06 mg/kg/day	
	Fluoranthene	0.04 mg/kg/day	
	Fluorene	0.04 mg/kg/day	
	Pyrene	0.03 mg/kg/day	
	Toluene	0.02 mg/kg/day	
	Xylene	2 mg/kg/day	
STATE			
Regulations and Guidelines: a. Air:	Average Acceptable Ambient Air Concentrations		NATICH 1992
	Diesel Fuel Emissions		
	30 min.	90 µg/m^3	
TX	Annual	9 µg/m^3	
	Gasoline		
CT	8 hours	1.8x10^4 µg/m^3	
FL-Ft Ldle	8 hours	9 mg/m^3 (9x10^3 µg/m^3)	
FL-Pinella	8 hours	9x10^3 µg/m^3	
	24 hours	2.16x10^3 µg/m^3	
KS	1 year	1.33 µg/m^3	
KS-KC	Annual	1.33 µg/m^3	
MI	Annual	1.3 µg/m^3	
ND	8 hours	8.9 mg/m^3 (8.9x10^3 µg/m^3)	
	1 hour	14.8 mg/m^3 (14.8x10^3 µg/m^3)	

Table 7-1. Regulations and Guidelines Applicable to Total Petroleum Hydrocarbons (continued)

Agency	Description	Information[a]	References
STATE (cont.)			
NV	8 hours	21.4 mg/m^3 (21.4x10^3 µg/m^3)	
OK	24 hours	8.9x10^4 µg/m^3	
TX	30 min. Annual	8.9x10^3 µg/m^3 8.9x10^2 µg/m^3	
VA	24 hours	1.5x10^4 µg/m^3	
	Naphtha		
AZ	24 hours	2.6x10^3 µg/m^3	
CT	8 hours 8 hours	2.7x10^4 µg/m^3 60 µg/m^3	
FL-Pinella	8 hours 24 hours	4x10^3 µg/m^3 9.6x10^2 µg/m^3	
TX	30 min. Annual	4x10^3 µg/m^3 4x10^2 µg/m^3	
VA	24 hours	2.25x10^2 µg/m^3	
	Petroleum Distillates		
FL-Ft Ldle	6 hours	9 mg/m^3 (9x10^3 µg/m^3)	
NY	1 year	3x10^{-2} µg/m^3	
TX	30 min. Annual 30 min. Annual	8.9x10^3 µg/m^3 8.9x10^2 µg/m^3 3.5x10^3 µg/m^3 3.5x10^2 µg/m^3	
	Petroleum Gases, Liquified		
ND	8 hours	18 mg/m^3 (18x10^3 µg/m^3)	
TX	30 min. Annual	1.8x10^4 µg/m^3 1.8x10^3 µg/m^3	
VA	24 hours	3x10^4 µg/m^3	
WA-SWEST	24 hours	5.99x10^3 µg/m^3	
b. Water:	State Administered Underground Injection Control Programs		40 CFR 147 EPA 1984
AL, AK, CO, FL, ID, IL, KS, KY, MD, MI, MS, MT, NE, NV, NM, NY, ND, OH, OK, PA, RI, SD, TN, TX, U, WA, WY	Class II		
AL, AR, CA, CO, CT, DE, FL, GA, ID, IL, KS, LA, ME, MD, MA, MN, NC, ND, OH, OK, OR, RI, SC, SD, TX, U, VT, WA, WV, WI, WY	Indian Lands		

Table 7-1. Regulations and Guidelines Applicable to Total Petroleum Hydrocarbons (continued)

Agency	Description	Information[a]	References
STATE (cont.)			
ME	Drinking Water (guideline)	50 $\mu g/m^3$	FSTRAC 1990
MA	Upper Concentration Limits in Groundwater	100,000 $\mu g/L$ (ppb)	BNA 1999
MA	Upper Concentration Limits in Soil	10,000 $\mu g/g$ (ppm)	BNA 1999
CT	Groundwater Protection Criteria	500 $\mu g/L$ (ppb)	BNA 1999
AK, DE, HI, IN, MA, MD, ME, MN, MO, MS, MT, ND, NE, OK, SD, TN, UT, VA, WA, WI, WV, WY	Groundwater Cleanup Standards[b]	States with TPH Parameter[c]	Judge et al. 1998
AK, AL, AZ, CA, DE, FL, HI, IN, IO, KS, MA, MD, ME, MN, MO, MS, MT, NC, ND, NE, NH, NM, NV, OH, OK, OR, RI, SC, SD, TN, UT, VA, VT, WA, WI, WY	Soil Cleanup Standards[D]	States with TPH Parameter[c]	Judge et al. 1997

[a] "Yes" indicates that a specific value was not appropriate but that the referenced regulation or guideline is applicable.

[b] There are many limitations to presenting these standards in a summary table. Each state should be contacted for complete information. See Judge et al. 1998.

[c] Includes TRPH parameter (total recoverable petroleum hydrocarbons), TEH (total extractable hydrocarbons), gasoline range organics (GRO), and diesel range organics (DRO).

[d] See note "b" above and Judge et al. 1997.

ACGIH = American Conference of Governmental Industrial Hygienists; BNA = The Bureau of National Affairs; CFR = Code of Federal Regulations; DOT = Department of Transportation; EPA = Environmental Protection Agency; LOQ = Limit of Quantitation; NA = not applicable; NATICH = National Air Toxics Information Clearinghouse; NIOSH = National Institute of Occupational Safety and Health; ODW = Office of Drinking Water; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Wastes; OW = Office of Water; STEL = Short-term Exposure Limit; TLV= Threshold Limit Value; TTO = Total Toxic Organic; TWA = Time-weighted Average; WHO = World Health Organization