

Rhode Island Standards for Hydrocarbon Contaminated Groundwater^a Groundwater Objectives (GA and GB)^b

Product	Parameter/ Constituent	Lab Test ^c Protocol &Number	Cleanup Level ^{d,e,h} GA Groundwater	Cleanup Level ^d GB Groundwater
Gasoline	Benzene	EPA 8021 or 8260	0.005 mg/L	0.14mg/L
	Toluene	EPA 8021 or 8260	1 mg/L	1.7mg/L
	Ethylbenzene	EPA 8021 or 8260	0.7 mg/L	1.6mg/L
	Xylenes (Total)	EPA 8021 or 8260	10 mg/L	not specified
	MTBE	EPA 8021 or 8260	0.04 mg/L	5mg/L
	Naphthalene	EPA 8021, 8260 or 8270	0.10 mg/L	not specified
Diesel	BTEX	same as gasoline	same as gasoline	same as gasoline
	Naphthalene	same as gasoline	same as gasoline	same as gasoline
Waste Oil	All VOCs	EPA 8021 or 8260	See full VOC list in Remediation Regulations	See full VOC list in Remediation Regulations

^a These Groundwater Objectives for contaminated groundwater are applicable to sites managed under the RIDEM *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* (Remediation Regulations), as amended Draft 2011, as well as to sites managed by the RIDEM Leaking Underground Storage Tank (LUST) Program.

^b Groundwater classified as GA is presumed to be suitable for use as drinking water without treatment. Groundwater classified as GB is presumed to be degraded and not suitable for use as drinking water without treatment.

^c Preferred lab analytical test methods are recommended in the Remediation Regulations, but not specifically required.

^d The reportable concentrations for groundwater are the same as the soil cleanup levels.

^e The presence of non-aqueous phase liquids (NAPL) in groundwater is considered to exceed the RIDEM Upper Concentration Limits and removal is required. Dissolved concentrations are determined only after NAPL removal is completed.

^f Waste oil contaminated groundwater being managed under the RIDEM RCRA program may require that additional analytical parameters be tested for.

^g Site managed under the Site Remediation Program must also meet all applicable GA or GB Groundwater Objectives listed in the Remediation Regulations.

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Web Site: <http://www.dem.ri.gov/programs/benviron/waste/index>.

Rhode Island Standards for Hydrocarbon Contaminated Soil ^a Direct Exposure Criteria (Residential and Industrial/Commercial)

Product	Parameter / Constituent	Lab Test ^b Protocol & Number	Cleanup Level ^{f, h}	
			Residential	Ind./Commercial
Gasoline	TPH	Modified EPA 8015 ^c	500 or 1000 mg/kg ^e	2500 mg/kg
	Benzene	EPA 8021 or 8260	2.5 mg/kg	200 mg/kg
	Toluene	EPA 8021 or 8260	190 mg/kg	10,000 mg/kg
	Ethylbenzene	EPA 8021 or 8260	71 mg/kg	10,000 mg/kg
	Total Xylenes	EPA 8021 or 8260	110 mg/kg	10,000 mg/kg
	MTBE	EPA 8021 or 8260	390 mg/kg	10,000 mg/kg
	Naphthalene	EPA 8021, 8260 or 8270	54 mg/kg	10,000 mg/kg
Diesel	TPH	Modified EPA 8015 ^c or Modified EPA 8100 ^d	500 or 1000 mg/kg ^e	2500 mg/kg
	BTEX	Same as gasoline	Same as gasoline	Same as gasoline
	Naphthalene	Same as gasoline	Same as gasoline	Same as gasoline
Waste Oil ^g	TPH	EPA 418.1 or Modified EPA 8100 ^d	500 or 1000 mg/kg ^e	Same as gasoline
	All VOCs	EPA 8021 or 8260	See Full VOC List in Remediation Regulations	See Full VOC List in Remediation Regulations

^a These Direct Exposure Criteria for contaminated soils are only applicable to sites managed under the RIDEM *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* (Remediation Regulations), as amended August 1996. Sites with hydrocarbon contaminated soil resulting exclusively from a Leaking Underground Storage Tank (LUST) are managed by the RIDEM LUST Program on a site by site basis.

^b Preferred lab analytical test methods are recommended in the Remediation Regulations, but not specifically required. Sites managed under the LUST Program

should refer to the RIDEM *UST Closure Assessment Guidelines* for specific required lab analytical test methods.

^c TPH by EPA Method 8015 modified (purge and trap - GC/FID) or equivalent.

^d TPH by EPA Method 8100 modified (extraction - GC/FID) or equivalent.

^e The Residential TPH Direct Exposure Criterion may be 1000 mg/kg contingent upon field-verification by Department personnel to ensure that short-term risks are managed appropriately prior to approval as a final remedial objective.

^f The reportable concentrations for soil are the same as the cleanup levels.

^g Waste oil contaminated soil being managed under the RIDEM RCRA Program may require that additional analytical parameters be tested for.

^h Sites managed under the Site Remediation Program must also meet all applicable Residential or Industrial/Commercial Direct Exposure Criteria for soil listed in the Remediation Regulations.

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Rhode Island Standards for Hydrocarbon Contaminated Soil ^a Leachability Criteria (GA and GB) ^b

Product	Parameter/ Constituent	Lab Test ^c Protocol & Number	Cleanup Level ^{g, i} GA Leachability	Cleanup Level ^g GB Leachability
Gasoline	TPH	Modified EPA Method 8015 ^d	500 or 1000 mg/kg ^f	2500 mg/kg
	Benzene	EPA Method 8021 or 8260	0.2 mg/kg	4.3 mg/kg
	Toluene	EPA Method 8021 or 8260	32 mg/kg	54 mg/kg
	Ethylbenzene	EPA Method 8021 or 8260	27 mg/kg	62 mg/kg
	Xylenes (Total)	EPA Method 8021 or 8260	540 mg/kg	Not specified
	MTBE	EPA Method 8021 or 8260	0.9 mg/kg	100 mg/kg

	Naphthalene	EPA Method 8021, 8260 or 8270	0.8 mg/kg	Not specified
Diesel	TPH	Modified EPA Method 8015 ^d or Modified Method 8100 ^e	500 or 1000 mg/kg ^f	2500 mg/kg
	BTEX	Same as gasoline	Same as gasoline	Same as gasoline
	Naphthalene	Same as gasoline	Same as gasoline	Same as gasoline
Waste Oil ^h	TPH	EPA Method 418.1 or Modified EPA Method 8100 ^e	500 or 1000 mg/kg ^f	Same as gasoline
	All VOCs	EPA Method 8021 or 8260	See Full VOC List in Remediation Regulations	See Full VOC List in Remediation Regulations

^a These Leachability Criteria for contaminated soils are only applicable to sites managed under the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations), as amended August 1996. Sites with hydrocarbon contaminated soil resulting exclusively from a Leaking Underground Storage Tank (LUST) are managed by the RIDEM LUST Program on a site by site basis. Although the RIDEM LUST Program uses the Leachability Criteria as goals, the standards are not enforceable by the regulations covering LUSTs.

^b Groundwater classified as GA is presumed to be suitable for use as drinking water without treatment. Groundwater classified as GB is presumed to be degraded and not suitable for use as drinking water without treatment.

^c Preferred lab analytical test methods are recommended in the Remediation Regulations, but not specifically required. Sites managed under the LUST Program should refer to the RIDEM UST Closure Assessment Guidelines for specific required lab analytical test methods.

^d TPH by EPA Method 8015 modified (purge and trap - GC/FID) or equivalent.

^e TPH by EPA Method 8100 modified (extraction - GC/FID) or equivalent.

^f The GA TPH Leachability Criterion may be 1000 mg/kg and may be field-verified at the discretion of the Department to ensure that short-term risks are managed appropriately prior to approval as a final remedial objective.

^g The reportable concentrations for soil are the same as the soil cleanup levels.

^h Waste oil contaminated soil being managed under the RIDEM RCRA Program may require that additional analytical parameters be tested for.

ⁱ Sites managed under the Site Remediation Program must also meet all applicable GA or GB Leachability Criteria for soil listed in the Remediation Regulations.

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