STATE OF CONNECTICUT

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name:	**Southington (DePaolo Drive) Landfill; Metal Hydroxide Cell 1**
Facility Address:	**DePaolo Drive, Southington, CT 06489**
Facility EPA ID #:	**CTD000844308**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   Y If yes - check here and continue with #2 below.
   _ If no - re-evaluate existing data, or
   _ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of □Migration of Contaminated Groundwater Under Control□ EI

A positive □Migration of Contaminated Groundwater Under Control□ EI determination (□YE□ status code) indicates that the migration of □contaminated□ groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original □area of contaminated groundwater□ (for all groundwater □contamination□ subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The □Migration of Contaminated Groundwater Under Control□ EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

** ACRONYMS and ABBREVIATIONS used in response on this form are given at the end of the form.

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2. Is **groundwater** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

Y If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

1) GW at the site has been classified as GB, indicating that it may not be suitable for direct human consumption due to waste discharges or land use impacts. Groundwater 1,600 feet southeast (at Norwood Ave. and Cloverdale Rd.) and 2500 feet southwest (at Welch Road) of the landfill / Cell 1 is designated GA and presumed to be suitable for drinking without treatment. There are several residential wells in the above mentioned locations.

2) The shallow groundwater flow is southwest from the landfill and appears to be controlled by the Eightmile River. The deeper groundwater within the unconsolidated deposits flows above till and bedrock southwest and south down the Eightmile River valley.

3) Risk-based levels for groundwater in GB and GA areas are promulgated by Connecticut Remediation Standard Regulations (CT RSR) including (Table 1): Groundwater Protection Criteria (GWPC) (for GA areas only), Surface Water Protection Criteria (SWPC); Volatilization Criteria (VC); no interference with any existing use of the GW.

4) Based on 1988-2000 GW monitoring data, the contaminants at the site are:

- Leachate indicator parameters: total dissolved solids, specific conductance, alkalinity, ammonia, hardness.

- Inorganic: barium, chloride, iron, manganese, sodium.

- Volatile organic compounds (VOCs): benzene, cis-dichloroethene, trichloroethylene (TCE), vinyl chloride.

5) Shallow groundwater adjacent to the down-gradient side of the landfill and east of the Eightmile River appears to be impacted by landfill leachate. In general, concentrations of the above contaminants decrease with distance from the landfill. Based on the last 5-7 years of monitoring data, groundwater quality is relatively stable (Ref. 1). West of the river, the shallow groundwater appears to be impacted by Bristol Landfill located 2000 feet north of Depaolo Drive Landfill. No impact can be attributed to the metal hydroxide Cell 1.

6) Based on extensive investigations conducted on behalf of the City of Bristol (Ref. 2), leachate appears to quickly migrate to the base of the stratified drift aquifer to depths of 50-75 feet. The downgradient (southward) extent of the plume in the deeper groundwater is beyond Welch Road. Due to similarity of the leachate plumes from the two landfills, it is not possible to differentiate impact of each of the landfills. Low hydraulic conductivity of the till and bedrock is likely limited or prevented migration of leachate below base of the stratified drift.

7) Surface Water. The Eightmile River located about 1000 feet southwest of the landfill is C/B (Figure 1). Based on upward hydraulic gradient observed in several locations, shallow groundwater from the landfill area is discharging to the surface waters and to Eightmile River. However, impact appears to be minor. More significant impact on the Eightmile River was documented upstream, from the Bristol Landfill (Ref. 2). The trend in concentration of contaminants is decreasing after closure activities at the Bristol Landfill in 1999.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

_ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

X If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Based on extensive investigations conducted on behalf of the City of Bristol in 1996-2000 (Ref. 2), the down-gradient (southward) extent of the plume in the deeper groundwater is beyond Welch Road, far away then was expected. It appears that the plume is not at steady state and there is a need to continue studies.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_ If yes - continue after identifying potentially affected surface water bodies.

_ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and [implemented])?

- If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
  2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

- If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

- If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

   _ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

   _ If no - enter "NO" status code in #8.

   _ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Southington (DePaolo Drive) Landfill and Metal Hydroxide Cell 1** facility, EPA ID # **CTD000844308**, located at **DePaolo Drive, Southington, CT 06489.** Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater". This determination will be re evaluated when the Agency becomes aware of significant changes at the facility.

_ NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN IN - More information is needed to make a determination.

In response to requirements of the Consent Order No. SW-375 issued to the City of Bristol on October 24, 1995, the City of Bristol will continue investigations of the extent of of the leachate plume south of Welch Road (Ref. 2). There is a need for the Town of Southington to join these investigations, or conduct similar investigation east of the area covered by the City of Bristol, as required by Order No. HM-460 (Second Modification) issued on November 7, 1988 to the Town of Southington and still outstanding.

Completed by (signature) Gene Shteynberg Date **September 19 , 2001**
(print) **Gennady G. Shteynberg**
(title) **Environmental Analyst 3**

Supervisor (signature) John England Date **September 19, 2001**
(print) **John England** MHH 9/28/01
(title) **Supervising Environmental Analyst**

Locations where References may be found:
1) Connecticut Department of Environmental Protection, File Room, 79 Elm Street, Hartford, CT 06106
2) US EPA Region I, John F. Kennedy Federal Building, Boston, MA 02203

List of Major References

5 **2000 Annual Summary of Groundwater Quality Monitoring Cell 1 and Depaolo Drive Landfill, Southington, CT; February 2001. Prepared by GZA GeoEnvironmenal. DEP File.**

6 **Leachate Impact Assessment Report, Bristol Landfill, Lake Avenue, Bristol, CT. September 2000. Prepared for City of Bristol by Fuss & O'Neill. DEP File.**

7 **RCRA Comprehensive Monitoring Evaluation (CME) Summary Memo for Southington (Depaolo Drive) Landfill. Prepared by G. Shteynberg, DEP, July 12, 1994. DEP File.**

8 **Post-Closure Part B Permit Application for Cell 1 and Depaolo Drive Landfill, Southington, CT. Volums I-VIII. December 1991. Prepared by GZA GeoEnvironmenal. DEP File.**

Attachments: **Figures:**
1 Site Location Map and Groundwater Classification (Reference 2)
2 Inferred Groundwater Contours (Reference 1)
3 Known Extent Leachate Impact (Reference 2)

Tables:
1 Survey of Numerical Criteria, CTDEP Remediation Standard Regulations
2 Acronyms and Abbreviation List

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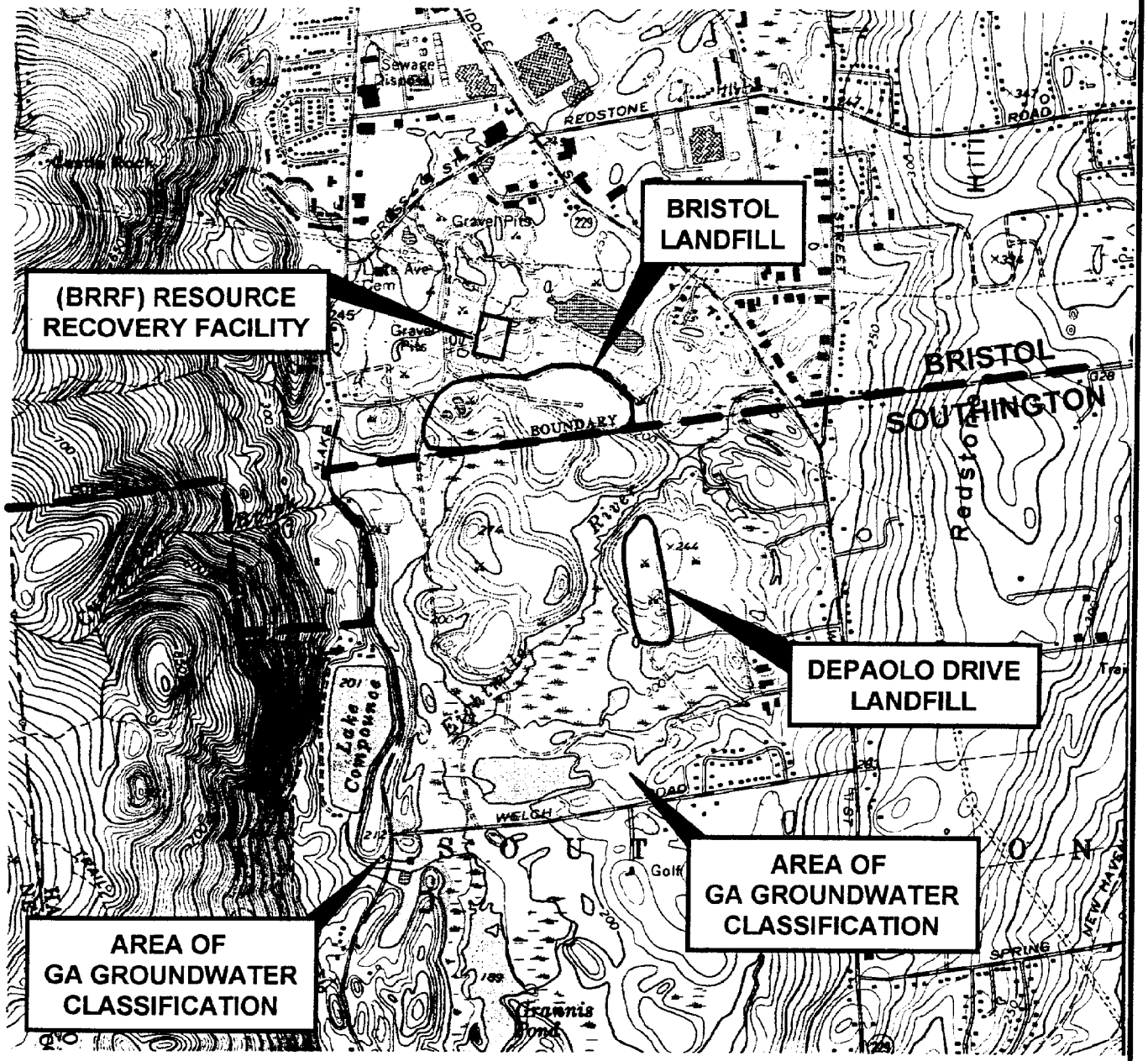


SCALE = 1: 24000

0 1/2 1 MILE

0 2000 4000

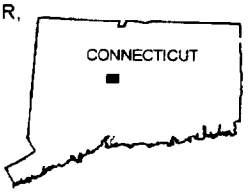
SCALE: 1"= 2000'

MAP REFERENCE:

THIS MAP WAS PREPARED FROM THE FOLLOWING 7.5 MINUTE SERIES TOPOGRAPHIC MAP: BRISTOL, CONN. 1966 PHOTOREVISED 1984 AND CTDEP MAP OF WATER QUALITY CLASSIFICATIONS FOR THE HOUSATONIC RIVER, HUDSON RIVER, AND SOUTHWEST COASTAL BASINS, DATED APRIL 8, 1997.

NOTE:

GROUNDWATER IS CLASSIFIED AS GA EXCEPT WHERE NOTED



QUADRANGLE LOCATION

FIGURE NO. 1

FUSS & O'NEILL INC. *Consulting Engineers*
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(203) 646-2469

SITE LOCATION MAP AND GROUNDWATER CLASSIFICATIONS

LEACHATE IMPACT ASSESSMENT

BRISTOL LANDFILL

BRISTOL CONNECTICUT

PROJ. NO. 95-489A1 DATED : SEPTEMBER 2000 SCALE 1"= 2000'

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RCRA Document Management System (RDMS)
Image Target Sheet

RDMS Document ID# 739

Facility Name: Southington Town Landfill

Phase Classification: R-13

Document Title: Environmental Indicator (EI) Determination, Migration of Contaminated Groundwater Under Control (CA 750 IN) - Southington Town Landfill

Date of Document: 09-28-2001

Document Type: EI Determination

Purpose of Target Sheet:

[x] Oversized **[ ] Privileged**

[ ] Page(s) Missing **[ ] Other (Please Provide Purpose Below)**

Comments:
Oversized Map of Known Extent of Leachate Impact, Leachate Impact Assessment Report

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US EPA New England
RCRA Document Management System (RDMS)
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[ ] Page(s) Missing **[ ] Other (Please Provide Purpose Below)**

Comments:
Oversized Map of DePaolo Drive Landfill

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Survey of Numerical Criteria

CTDEP Remediation Standard Regulations
Appendices A, B, C, D, E, and F
Promulgated January 30, 1996

Media	Soil				Ground Water/Surface Water				Soil Vapor	
Regulatory Criteria by Media Type/(DEP Abbreviation)	**RES DEC (mg/kg)**	**I/C DEC (mg/kg)**	**GA/GAA PMC (mg/kg)**	**GB PMC (mg/kg)**	**GA/GAA GWPC (ug/L)**	**SWPC (ug/L)**	**RES VC (ug/L)**	**I/C VC (ug/L)**	**RES VC (ppm)**	**I/C VC (ppm)**
Bis(2-chloroisopropyl)ether	8.8	82	1	2.4	12	3400000	NE	NE	NE	NE
Bis(2-ethyl hexyl)phthalate	44	410	1	11	2	59	NE	NE	NE	NE
Butyl benzl phthalate	1000	2500	20	200	1000	NE	NE	NE	NE	NE
2-chlorophenol	340	2500	1	7.2	36	NE	NE	NE	NE	NE
Di-n-butyl phthalate	1000	2500	14	140	700	120000	NE	NE	NE	NE
Di-n-octyl phthalate	1000	2500	2	20	100	NE	NE	NE	NE	NE
2,4-Dichlorophenol	200	2500	1	4	20	15800	NE	NE	NE	NE
Fluoranthene	1000	2500	5.6	56	280	3700	NE	NE	NE	NE
Fluorene	1000	2500	5.6	56	280	140000	NE	NE	NE	NE
Hexachloroethane	44	410	1	1	3	89	NE	NE	NE	NE
Hexachlorobenzene	1	3.6	1	1	1	0.077	NE	NE	NE	NE
Naphthalene	1000	2500	5.6	56	280	NE	NE	NE	NE	NE
Pentachlorophenol	5.1	48	1	1	1	NE	NE	NE	NE	NE
Phenanthrene	1000	2500	4	40	200	0.077	NE	NE	NE	NE
Phenol	1000	2500	80	800	4000	92000000	NE	NE	NE	NE
Pyrene	1000	2500	4	40	200	110000	NE	NE	NE	NE
Pesticides/PCBs										
Alachlor	7.7	72	0.23	0.4	2	NE	NE	NE	NE	NE
Aldicarb	14	410	1	1	3	NE	NE	NE	NE	NE
Atrazine	2.8	26	0.2	0.2	3	NE	NE	NE	NE	NE
Chlordane	0.49	2.2	0.066	0.066	0.3	0.3	NE	NE	NE	NE
Dieldrin	0.038	0.36	0.007	0.007	0.002	0.1	NE	NE	NE	NE
Endrin	20	610	NE	NE	NE	0.1	NE	NE	NE	NE
2-4 D	680	20000	1.4	14	70	NE	NE	NE	NE	NE
Heptachlor epoxide	0.067	0.63	0.02	0.02	0.2	0.05	NE	NE	NE	NE
Heptachlor	0.14	1.3	0.013	0.013	0.4	0.05	NE	NE	NE	NE
Lindane	20	610	0.02	0.04	0.2	NE	NE	NE	NE	NE
Methoxychlor	340	10000	0.8	8	40	NE	NE	NE	NE	NE
Simazine	NE	NE	0.8	8	4	NE	NE	NE	NE	NE
Toxaphene	0.56	5.2	0.33	0.6	3	1	NE	NE	NE	NE
Polychlorinated Biphenyls (PCBs)	1	10	*0.0005	*0.005	0.5	0.5	NE	NE	NE	NE

Abbreviations

* = Standard determined using TCLP/SPLP analyses	ppm = parts per million
GWPC = Ground Water Protection Criteria	RES = Residential
I/C = Industrial/Commercial	SPLP = Synthetic precipitaiton Leaching Procedure
mg/kg = miligrams per kilogram or ppm	SWPC = Surface Water Protection Criteria
mg/L = milligrams per kilogram or ppm	TCLP = Toxicity Characteristic Leaching Procedure
NE = None Established by DEP	ug/L = micrograms per liter or parts per billion
PMC = Pollutant Mobility Criteria	VC = Volatilization Criteria

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The regulatory standards presented in this summary should be confirmed through comparison with an edition of the Remediation Standard Regulations certified by the Secretary of State.

ACRONYMS AND ABBREVIATIONS LIST

Cd	**cadmium**
CT DEP	**Connecticut Department of Environmental Protection**
CT RSR	**Connecticut Remediation Standard Regulations**
DEC	**direct exposure criteria**
GB area	**area where the groundwater classification is GB (established by CT Water Quality Standards)**
GW	**groundwater**
I/C	**industrial/commercial**
MC	**methylene chloride**
mg/kg	**micrograms per kilogram**
NAPL	**non-aqueous phase liquid**
Ni	**nickel**
PCB	**polychlorinated biphenyl**
PCE	**tetrachloroethene**
PMC	**pollutant mobility criteria**
ppb	**parts per billion**
ppm	**parts per million**
SPLP	**synthetic precipitation leaching procedure**
SWPC	**surface water protection criteria**
TCA	**trichloroethane**
TCE	**trichloroethene**
TCLP	**Toxicity Characteristic Leaching Procedure EPA Method 1311**
TPH	**total petroleum hydrocarbons**
ug/l	**micrograms per liter**
VC	**volatilization criteria**
VOCs	**volatile organic compounds**
Zn	**zinc**

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