



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 (CA725)

Current Human Exposures 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 soil, groundwater, surface water/sediments, and air, 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?

- YES If yes - check here and continue with #2 below.
- If no - re-evaluate existing data, or
- if data are not available skip to #6 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 "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "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 "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

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 responses on this form are given at the end of the form.

79 Elm Street • Hartford, CT 06106-5127

An Equal Opportunity Employer • http://dep.state.ct.us

Celebrating a Century of Forest Conservation Leadership

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)**

Page 2

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"<sup>1</sup> above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	Y	-	-	1988-2000 groundwater monitoring data / 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 (VC).
Air (indoors) <sup>2</sup>	-	N	-	There are no existing buildings or structures at the landfill. The primarily land use down gradient of the landfill is sand and gravel mining and an outdoor parking lot.
Surface Soil (e.g. <2 ft)	-	N	-	The landfill has been closed by installation of a synthetic membrane for both RCRA Cell 1 and Solid Waste; and covered by clean fill and topsoil and presently vegetated.
Surface Water	Y	-	-	1988-2000 surface water monitoring data / Inorganic: iron, manganese, sodium.
Sediment	Y	-	-	The Eightmile River sediment sampling/ Inorganic: iron.
Subsurface Soil (e.g., >2 ft)	Y	-	-	1967-1983 landfill operations data / Municipal solid waste (mixed residential, commercial and industrial); potential hazardous waste residue.
Air (outdoors)	-	N	-	The volume and concentrations of the landfill gases can be assumed to be negligent due to the fact that waste was disposed of there 20 and more years ago.

- If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels" and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

Y If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

- If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

1) Risk-based levels used for each medium are as follows:

Groundwater: Connecticut Remediation Standard Regulations (CT RSR) criteria including:

- for GA areas only: Groundwater Protection Criteria (GWPC);
- for GB and GA areas: Surface Water Protection Criteria (SWPC); Volatilization Criteria (VC); no interference with any existing use of the GW (Table 1).

Indoor & Outdoor Air: CT RSR Industrial/Commercial Volatilization Criteria (I/C VC).

Subsurface Soil CT RSR Industrial/Commercial Direct Exposure Criteria (I/C DEC) and Pollutant Mobility Criteria (PMC) in soils for GB areas.

2) Groundwater Groundwater at the site is classified as GB. The groundwater 1,600 feet southeast and 2500 feet southwest (at Welch Road) of the landfill / Cell 1 is designated GA. 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 above till flows southwest and south down the Eightmile River valley.

The 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

(Attachment 4). 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. Based on extensive investigations conducted on behalf of the Town of Bristol (Ref. ), 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.

Surface Water. The surface water in the Eight Mile 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. ). The trend in concentration of contaminants is decreasing after closure activities at the Bristol Landfill in 1999.

Sediments. Elevated concentration of metals (iron) in the Eightmile River from leachate from both landfills is documented in (Ref. ). The trend in concentration of contaminants is decreasing downstream of the Depaolo Drive Landfill and after closure activities at the Bristol Landfill in 1999.

Footnotes:

<sup>1</sup> "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 appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
 Page 3

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

<u>"Contaminated" Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	Yes	No	No	No			No
Air (indoors)							
<del>Soil (surface, e.g., &lt;2 ft)</del>							
Surface Water	Yes	Yes			Yes	Yes	Yes
Sediments	No	Yes			No	Yes	No
Soil (subsurface e.g., >2 ft)				No			No
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.
2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("\_\_\_"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- Y If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination)-continue after providing supporting explanation.
- If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

**Groundwater Pathway to Residents:** There are private wells down-gradient from the Depaolo Drive Landfill south of Welch Road. However, based on the data from Ref. 1, Figure 2, the private homes are located to the east of the landfill plume. The residential wells southeast of the landfill have been monitoring for several years and do not show contamination.

**Surface Water and Sediments Pathways:** Workers and trespassers may contact the Eightmile River water and sediments. However, exposure is expected to be insignificant and unlikely due to the security measures and the inaccessibility of the river. Residents, recreators and trespassers may be potentially exposed to contaminants during recreational activity, including swimming and fishing in Grannis pond south of Welch Road. However, Grannis Pond is unlikely to be a major receiving body for the contaminated groundwater due to the depth of the plume. There is a plan to dredge the pond. Further evaluation of contaminants in sediments and surface water in the pond will be done after the dredging..

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc).

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**

Page 4

- 4 Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant"<sup>4</sup> (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

- No\_ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."
- \_ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."
- \_ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s): **Exposures are not expected to be significant based on the following:**  
Groundwater

- The common Depaolo Drive Landfill and Bristol landfill plume is 50-60 feet below surface at Welch Road and relatively narrow (Ref. ). The existing residential wells appear to be side-gradient to the plume and screened either in the shallow stratified drift aquifer or the deep bedrock aquifer not affected by the plume.
- Due to distance from the landfills, the plume is relatively diluted. Due to the recent 1999 capping of the Bristol Landfill, further dilution of contaminated groundwater is anticipated.
- There is a plan in the Southington Water Works Department to extend the city water line along Welch Road, to the intersection with Mt. Vernon Road (perhaps as early as next one-two years).

Surface Water & Sediments

- Workers' and trespassers' exposures to the Eightmile River water and sediments are expected to be insignificant due to minimal magnitude of contamination. The exposures also unlikely due to the security measures (safety rules for workers and fence against trespassing) and the inaccessibility (vegetation, mud) of the river.
- The major surface water body downgradient of the landfill, Grannis Pond, is unlikely to be a major receiving body for the contaminated groundwater due to the depth of the plume.
- Due to the recent 1999 closure (capping) of the Bristol Landfill, further decreasing trend in the surface water contamination is anticipated.

<sup>4</sup> If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**

Page 5

- 5 Can the "significant" exposures (identified in #4) be shown to be within acceptable limits?
- If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
  - If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.
  - If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

