

# Health Assessment for

LANDFILL AND DEVELOPMENT COMPANY

GERCLIS NO. NJD048044325

MOUNT HOLLY, NEW JERSEY

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Agency for Toxic Substances and Disease Registry  
U.S. Public Health Service

## THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104(1)(7)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, this Health Assessment has been conducted using available data. Additional Health Assessments may be conducted for this site as more information becomes available.

The conclusions and recommendations presented in this Health Assessment are the result of site specific analyses and are not to be cited or quoted for other evaluations or Health Assessments.

**HEALTH ASSESSMENT  
LANDFILL AND DEVELOPMENT COMPANY  
BURLINGTON COUNTY  
MOUNT HOLLY, NEW JERSEY**

Prepared by:  
Division of Science and Research  
New Jersey Department of Environmental Protection (NJDEP)  
and  
Environmental Health Service  
New Jersey Department of Health (NJDOH)

Prepared for:  
Agency for Toxic Substances and Disease Registry (ATSDR)

**BACKGROUND**

Landfill and Development Company (L & D) is currently on the National Priorities List (NPL). The L & D is located within Mt. Holly, Eastampton, and Lumberton Townships, in Burlington County, New Jersey. The L & D Landfill comprises 300 acres and was developed as two discrete sections: the Eastampton/Lumberton section and the Mt. Holly section. Both sections were developed in former sand and gravel quarry areas.

L & D has a history of poor landfill operation and odor complaints (NJDEP, Interim Background Investigation Report). NJDEP has been involved with the permitting, inspection, and regulation of L & D since 1970. In June 1973, NJDEP issued an Administrative Order requiring L & D to perform a hydrogeologic investigation. The result of this investigation indicated that groundwater contamination originated from the L & D Landfill. In December 1973, NJDEP issued an Administrative Order requiring L & D to correct groundwater contamination in the vicinity of the site. In 1981, the Eastampton/Lumberton section of the landfill reached its capacity and was therefore closed. In May 1986, NJDEP issued a Directive for L & D to conduct a Remedial Investigation/Feasibility Study (RI/FS). In December 1986, NJDEP closed the Mt. Holly section of the Landfill. Currently, the only active operation in the Landfill is the gas recovery.

Results from Phase I of the RI/FS confirmed that the L & D landfill had contaminated the groundwater in the vicinity of the site. In addition, the surface water sediment has been

contaminated. The RI/FS is scheduled to be completed by the end of 1990.

## COMMUNITY CONCERNS

On April 4, 1987, NJDEP conducted a public meeting to discuss the initiation of the RI/FS study for the L & D site. The issues and concerns presented by the attending public may be summarized as follows:

- \* The lack of adequate erosion and sediment controls at the site. Cited problems include: flooding of local residential properties after heavy rain, excessive siltation of the Smithville Canal, and mud flow onto local roads and properties.
- \* The possible contamination of groundwater aquifers.
- \* The possible contamination of the Rancocas Creek by leachate of contaminated groundwater infiltration.
- \* The migration of methane gas off-site.
- \* Questions about the nature of the "white substance" seen on the banks of the Rancocas Creek near Paduka Road.

Other community concerns included the concern that funding for remediation of the site will not be available because of its priority ranking and the perceived slow progress by landfill owners to remediate existing problems.

## ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

### A. On-Site Contamination

#### Groundwater

Three aquifers at the L & D site have been found contaminated with the following volatile organic compounds (VOCs) and metals: methylene chloride, ethylbenzene, chlorobenzene, benzene, 1,2-dichloroethane, trans-1,2-dichloroethene, phenol, and xylene; arsenic, cadmium, mercury, nickel, and silver. (Phase I Sampling Report of Remedial Investigation) These aquifers are Cape May/Mt. Laurel Sand Aquifer (shallow aquifer), Middle Wenonah Aquifer (middle aquifer), and Englishtown Aquifer (deep aquifer). The levels of contaminants in these aquifers exceeding New Jersey or federal applicable or relevant and appropriate requirements (ARARs) are presented in Table 1. Although vertical flow has not yet been completely defined and the possibility exists for flow

into stratigraphically lower aquifers, the contamination of the Englishtown Aquifer may not be from L & D. Similar concentrations of nickel and phenol that were detected in the Englishtown Aquifer were detected in upgradient wells.

**TABLE 1. Groundwater Contaminants Exceeding New Jersey or Federal Applicable or Relevant and Appropriate Requirements (ARARs).**

Compound	Maximum Detected Conc. (ppb.)			ARAR
	----- Aquifer -----			
	A	B	C	
Benzene	48	-	-	1
Xylene	130	1,900	-	44
Methylene Chloride	-	4,100	-	2
Trans-1,2 Dichloroethene	-	47	-	10
1,2 Dichloroethane	-	530	-	2
Chlorobenzene	88	150	-	4
Ethylbenzene	49	380	-	700
Arsenic	210	12	-	50
Mercury	3	-	2	2
Cadmium	-	41	-	10
Silver	-	97	-	50
Nickel	430	740	820	350
Phenol	580	4,700	610	NA

Aquifers: A = Cape May/Mt. Laurel Sand  
 B = Middle Wenonah  
 C = Englishtown

NA = Not Available

Data from Phase I Remedial Investigation Sampling Report

## B. Off-Site Contamination

### Surface Water and Sediment

Three major surface water bodies surround the L & D Landfill: Rancocas Creek, Smithville Canal and Smithville Lake. The L & D site lies within the drainage basin of Rancocas Creek. The creek is located approximately 600 feet north of the L & D Landfill and generally flows in a west/northwest direction.

Smithville Canal lies within the floodplain of Rancocas Creek and flows to the west/northwest until discharging into Rancocas Creek. The canal receives runoff from the areas that lie between the canal and the landfill.

Smithville Lake, located approximately 1,600 feet northeast of the Eastampton section of the landfill, was constructed for recreational purposes.

Surface water and sediment samples were taken, by NJDEP, from nine sampling points along the southern bank of Rancocas Creek, two sampling points along the southern bank of Smithville Canal, and one sampling point at the confluence of Smithville Canal and Rancocas Creek. In addition, seven seeps north of the landfill were identified, from which aqueous and sediment samples were taken.

Neither organic nor inorganic compounds detected, by NJDEP, in any surface water samples exceed the Environmental Protection Agency (EPA) Ambient Water Quality Criteria. Metals which were detected in sediment samples at levels in excess of New Jersey Soil Cleanup Objectives are summarized in Table 2.

**TABLE 2. Sediment Contaminants Exceeding New Jersey Soil Cleanup Objectives in Smithville Canal and Rancocas Creek.**

Concentrations in parts per million (ppm).

Contaminant	Smithville Canal	Rancocas Creek	New Jersey Soil Cleanup Objective
Cadmium	-	3.5 - 7.1	3
Silver	6	9.7 - 15.0	5
Methylene Chloride	0.54	0.15 - 1.7	1 *

\* = 1 ppm. total organics.

With the exception of methylene chloride, no organic or inorganic compounds detected in seep aqueous samples exceeded the EPA Ambient Water Quality Criteria. Some metals, including cadmium, nickel, selenium, zinc, lead and, copper were detected in seep sediment samples at concentrations above New Jersey Soil Cleanup Objectives. These are summarized in Table 3.

**TABLE 3. Seep Sediment Contaminants Compared to New Jersey Soil Cleanup Objectives**

Contaminant	Sediment Samples	New Jersey Soil Cleanup Objectives
Cadmium	4.8 - 62	3
Nickel	130	100
Selenium	6.5	4.0
Zinc	650	350
Methylene Chloride	0.9 - 2.9	1 ppm. (Total Organics)
Lead	150 - 190	250
Copper	110 - 340	*

\* = Not Available

No sampling was performed on Smithville Lake. However, since the groundwater flows sidegradient to Smithville Lake, the Lake is probably not contaminated by the L & D Landfill.

#### Air

Since the landfill is capped and a gas collection system is used to collect and flare methane generated by the landfill (Personal communication, NJDEP), air contamination by the landfill is unlikely. Although methane generation was once a problem, recent analytical results of air monitoring wells at and around the L & D site did not show elevated levels of methane. In Phase II of the RI/FS, air sampling will be performed to detect any residual gases that might be associated with inefficient burning of methane.

#### C. Quality Assurance/Quality Control

All samples collected at the L & D site were analyzed in the laboratory of Baker/TSA, Inc. All of the data used in this document were accepted by the quality assurance/quality control review performed by NJDEP.

#### D. Site Visit and Physical Hazards

The entire L & D site is fenced, and the access to the site is restricted. No physical hazards are present at this site (Site visit, 1988). No odor from the site was noted during the site visit.

## **POTENTIAL ENVIRONMENTAL AND HUMAN EXPOSURE PATHWAYS**

### **A. Environmental Pathways**

#### **On-Site**

In Phase I of the RI/FS groundwater was identified as the primary on-site medium in which contaminants have been detected.

#### **Off-Site**

In Phase I of the RI/FS, the primary medium in which contaminants have been detected off-site is surface water sediment. These surface waters include: Rancocas Creek, Smithville Canal, and seeps.

About 50 homes are located 500 feet to the north of the site. Since the groundwater flows generally toward the northwest, there is a potential for groundwater contamination to migrate towards potable wells. Among these homes, 10 use private wells and the rest use municipal wells. Area residential wells were not sampled in Phase I of RI/FS. However, private well sampling data (1986) collected by NJDEP Division of Hazardous Site Mitigation indicated that these wells were not contaminated. In addition the 1988 samples, taken under the New Jersey Safe Drinking Water Act (A-280), did not show any evidence of contamination.

### **B. Human Exposure Pathways**

Rancocas Creek and Smithville Canal are used for recreation (canoeing), and children could get into seeps around the landfill. Possible human exposure by dermal contact with these surface water sediments may occur.

Since there is a potential for groundwater contamination to migrate from the L & D site to the nearby potable wells, human exposure may occur in the residences immediately adjacent to the L & D site. Potential human exposures may include ingestion of the contaminated well water, dermal absorption, and/or inhalation from cleaning or showering activities. Other human exposure could result from using contaminated well water for home garden irrigation. Possible exposure routes could include ingestion of contaminated crops and ingestion of contaminated soils by children.

## **DEMOGRAPHICS**

The L & D Landfill is situated in Mt. Holly Township, Eastampton Township, and Lumberton Townships, in Burlington



County, New Jersey. The size of the population within a 2 mile radius of the site is 20,000. L & D is bordered to the north by an inactive Penn Central railroad line and to the south by State Route 38. An agricultural area consisting of open fields borders the landfill to the east, and residential, commercial and light industrial areas are located along its western and northwestern borders. (Interim Background Investigation Report)

Land use within the L & D site is primarily a mix of residential, commercial, and wooded areas. Much of the land located south of the L & D is used for such agricultural activities as crop growing and cattle grazing. A sensitive population that is near the site is the county children's home, which lies adjacent to the western border of the Mt. Holly section of the landfill. Other potentially sensitive populations near the site need to be characterized.

## EVALUATION AND DISCUSSION

Analysis of groundwater samples from the L & D site detected contamination with the following organics and metals: methylene chloride, ethylbenzene, chlorobenzene, benzene, chloride, phenol trans-1,2-dichloroethene, 1,2-dichloroethane, and xylene; arsenic, cadmium, mercury, nickel, and silver.

Since the groundwater flows towards the northwest, the potable wells in that area could potentially be contaminated by the L & D leachate. Analysis of the 1986 samples from 10 private wells, taken by NJDEP Division of Hazardous Site Mitigation, however, did not reveal any contaminants. In addition, 1988 sampling results did not reveal any contaminants in municipal water supplies. NJDEP Division of Hazardous Site Mitigation sampled three private wells in January 1989, for volatile organic chemicals and metal. The only chemical that was detected was mercury at approximately 5 ppb (personal communication, NJDEP). Mercury was not detected in nearby wells or when the well was resampled. The mercury that was detected the potable well may have been due to laboratory or field contamination.

Surface water samples taken from Rancocas Creek, and Smithville Canal did not show any concentrations of chemicals exceeding EPA Ambient Water Quality Criteria. Sediment samples and seeps taken from these surface waters revealed significant concentrations of the metals cadmium, silver, nickel, selenium, zinc, copper, and lead, some marginally exceeding New Jersey Soil Cleanup Objectives. Since all these surface waters may potentially be used for recreation, human exposure may occur from dermal contact with the sediment.

## CONCLUSIONS AND RECOMMENDATIONS

On the basis of the information reviewed, the Landfill and Development Site is a potential public health concern because humans may be exposed to hazardous substances at concentrations that may result in adverse health effects. As noted in the Human Exposure Pathways section, human exposure to metals may occur [and may have occurred in the past] via dermal contact, surface waters, and groundwater.

The groundwater and surface water sediment at the L & D site have been contaminated with VOCs and metals. The groundwater contamination may potentially extend off-site to nearby potable wells, although neither private nor municipal well sampling performed recently revealed site-related contaminants in any water supplies. From the results of the potable water samples, delineation of the plume, and future site remediation activities, additional potable well sampling may be necessary.

In accordance with CERCLA as amended, the Landfill and Development Company site has been evaluated for appropriate follow-up with respect to health effects studies. Since a population exposed to on-site and off-site contaminants at a level of public health concern has not yet been identified, the Landfill and Development Company site is not being considered for follow-up health studies at this time. However, if data become available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, ATSDR and NJDOH will reevaluate this site for any indicated follow-up.

This Health Assessment was prepared by the State of New Jersey, Department of Health, Environmental Health Service, under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry. The Division of Health Assessment and Consultation and the Division of Health Studies of ATSDR have reviewed this Health Assessment and concur with its findings.

## REFERENCES

- NJDEP. 1987. Interim Background Investigation Report. Remedial Investigation/Feasibility Study, Landfill and Development Site, Mt. Holly Township, Burlington County, New Jersey. NJDEP, Division of Hazardous Site Mitigation.
- NJDEP. 1988. Phase I Sampling Report of Remedial Investigation. Landfill and Development Site, Mt. Holly Township, Burlington County, New Jersey. NJDEP, Division of Hazardous Site Mitigation.
- Technical Coordinator. 1988. Personal communication. NJDEP, Division of Hazardous Site Mitigation, technical coordinator of Landfill and Development Site.
- New Jersey Safe Drinking Water Act, N.J.A.C. 7:10-16.7