Department of Environmental Conservation

Town of Wallkill Landfill
Orange County, New York
Site Number 336017

New York State
Record of Decision

June, 1992

Funded Under Title 3
of the
1986 Environmental Quality Bond Act

PREPARED BY:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

MARIO M. CUOMO, *Governor* THOMAS C. JORLING, *Commissioner*

RECORD OF DECISION

THE WALLKILL LANDFILL SITE

ORANGE COUNTY, NEW YORK

SITE NO. 336017

PREPARED BY
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
JUNE 1992

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Town of Wallkill Landfill
Town of Wallkill
Orange County, New York
Site Code: 336017
Funding Source: 1986 Environmental Quality Bond Act

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial alternative for the Town of Wallkill Landfill which was chosen by the New York State Department of Environmental Conservation's (NYSDEC) in accordance with the New York State Environmental Conservation Law (ECL), and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et., seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Appendix C identifies the documents that comprise the Administrative Record for the site, and includes the final Remedial Investigation and Feasibility Study (RI/FS) report prepared by William F. Cosulich Engineers of Woodbury, New York. The documents in the Administrative Record are the basis for the selected remedial action.

Changes to the proposed remedial action plan (PRAP) were made to address public comments received.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present a current or potential threat to public health, welfare, and the environment.

SUMMARY OF THE GOVERNMENT'S DECISION

Based upon the results of the RI/FS and the criteria for selecting a remedy, the NYSDEC has selected the major elements of Alternative 3 to remediate the site.

The major elements of the selected remedy include:

- Excavation of the stream banks from the center line of the stream in selected on-site areas, disposal of the excavated waste, soils, and stream sediments on the existing landfill property and backfilling of the excavated area with clean fill. Removal, consolidation and regrading of wastes on the landfill and along its perimeter will be done as required for cap construction and for prevention of gas migration.

- Capping of the existing landfill with an associated landfill gas venting system as required by 6 NYCRR Part 360 regulations. Installation of a leachate monitoring system. Provisions will be made during design to allow conversion from a passive to an active gas venting system if warranted by long-term monitoring. Design of the remedy will include a contingency for disposal of removable quantity of materials which are discovered during additional field investigations or during construction.

- Temporary stream diversion and removal of contaminated surface water sediments in the area of stream embankment excavation. Disposal of removed sediments in the existing landfill.

- Installation of a posted fence around the perimeter of site.

- Preparation and Implementation during design of a long-term Maintenance and Monitoring Plan which will include additional monitoring wells. Near site drinking water, groundwater, surface water and landfill gas will be monitored for a minimum of 30 years and will include reevaluation of the site remedy every five years. Additional monitoring wells and sampling points will be established as the need is identified. This plan will make provision for consideration of new information as it is received and provide for a continuing public participation program with a yearly report on the status of the site for a minimum of five years, to be extended as necessary.

- Preparation of a Contingency Action Plan which will provide for implementation of groundwater controls (collection and treatment) or other remedial measures if long-term monitoring or additional information demonstrate that the final cover alone does not satisfactorily control any future off-site releases of hazardous substances. Should substances possibly now in the waste mass appear in the monitoring wells outside the waste mass in exceedance of standards which would pose a threat to human health or the environment, the Contingency Action Plan would be implemented.

- Institution of land use restrictions on-site to prevent disturbance of the cap and prohibit the use of groundwater on the site for other than sampling purposes.

- The constructed cover will be designed to accommodate future construction of groundwater capture and treatment.

DECLARATION

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. Waivers are justified for applicable or relevant and appropriate requirements that will not be met. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the preference for treatment as a principal element.

Because this remedy will not allow for unlimited use and unrestricted exposure within five years after commencement of remedial action, a five year policy review will be conducted. This evaluation will be conducted within five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Date

David L. Markell
Acting Deputy Commissioner
Office of Environmental Remediation
New York State Department of Environmental Conservation

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I. Site Location and Description

The Wallkill Landfill is located at a former sand and gravel pit approximately 5 miles north of Middletown, New York, in Orange County. Approximately 23-acres of the 68.1-acre parcel had been utilized for the disposal of municipal refuse. The area immediately surrounding the site consists of agricultural farmland, open fields, woods and some low lying marsh areas. Areas to the north and northwest of the site are zoned suburban residential. Areas directly to the south and southeast are zoned rural agricultural. The site is part of a planned Interchange Development. Private residences are sparsely located throughout the area.

The site lies within the Wallkill Valley which is part of a larger geological area known as the Valley and Ridge Province. Bedrock, in this area, consists of alternating sandstone and shale units overlain by complex sequences of unconsolidated glacial deposits. In general, site topography slopes toward Tributary No. 20, of the Shawangunk kill, which traverses the property flowing in a northeasterly direction between two off-site NYSDEC protected Class II wetlands. There are no protected NYSDEC wetlands within the site boundaries. The site does not lie within a known 500 year flood plain. Site surface water drains toward Tributary No. 20 and, in general, to the lower lying marsh areas to the northeast. There are no known critical habitats or endangered, threatened or rare species within one mile of the site.

II. Site History

The Town of Wallkill received approval from the NYSDOH to establish a sanitary landfill at the site then owned by Dickerson Sand and Gravel Company in January 1965.

The Town of Wallkill operated the Wallkill Landfill for the disposal of municipal solid waste from approximately 1965 to 1974. A limited amount of yard wastes and other wastes including sewage sludge may have been disposed of after 1974 on site. The landfill accepted residential and commercial solid waste. Battery recycling by-products, a number of drums suspected to contain hazardous waste, and sludge from the Town's municipal wastewater treatment facility were reported placed at the landfill.

Eye witness accounts provided by Town employees report that large volumes of unknown substances were placed in the landfill under suspicious circumstances. One operator allegedly sustained significant damage to his lungs during disposal activities. Another operator reported that suspicious substances were dumped directly into the stream. The contents of barrels were reported to have been intermingled with municipal waste.

An April 19, 1976 NYSDEC Inspection Report stated that 100 full or partially filled barrels of industrial wastes were observed at one location of the site. Some of the barrels had shipping labels indicating that they had come from Tuck Industries of Beacon, New York. One barrel was marked as shipped to Tell Industries in Newburgh. Other barrels indicated "Hooker Chemical Co-Ruco Division."

In 1981, the NYSDEC sampled leachate seeps and the NYSDOH obtained water samples from private residence water supplies.

In 1982, the Town of Wallkill and NYSDEC executed a State Grant Contract to perform an initial evaluation/investigation. Additional funding was granted in August 1984 for removal of the known drums under NYSDEC oversight.

A drum excavation and removal project was completed in September 1986. Two hundred and eight (208) drums were removed of which ten (10) were found to contain materials classified as hazardous. Approximately 1,000 cubic yards of contaminated soil was also encountered and disposed of.

Previous reports which document former site investigations and the removal of drums is presented in Appendix C.

III. Current Status

To assess the current status of the site, a remedial investigation was conducted to identify the nature and extent of any media contamination as a result of hazardous waste deposition. The following media were evaluated;

1. subsurface soil;
2. groundwater;
3. private water supplies;
4. surface water;
5. surface water sediment; and
6. ambient air.

A subsurface soil gas probe survey found significant concentrations of volatile organic vapors in the soil media within some areas of the landfill mass. Municipal refuse, in its normal process of decay, along with deminimus amounts of household hazardous wastes are normally the cause of volatized chemicals found within a municipal landfill. Given the known deposition of industrial wastes on site, a search was conducted for deposits of hazardous wastes. Soil gas information was considered along with the results of an on-site geophysics survey which is a surface scan for magnetic anomalies and

electrically conductive objects and fluids. An extensive test pit and trenching program was conducted. Additional investigations including test pits will be done during design if warranted by new information.

Based on an ambient air and an explosive gas study which was conducted near the landfill mass perimeter, volatile contaminants were not found to be migrating in quantities of concern beyond the landfill's boundaries. Explosive gas migration beyond the landfill mass was found to be minimal with the possible exception of a portion of the eastern boundary where elevated methane concentrations were observed in close proximity to the property line.

To assess the quality of groundwater, an array of groundwater monitoring wells was established in the encountered water bearing geologic formations and sampled. Samples of surface water and sediments were taken at selected points along Tributary No. 20 and in the marsh lands down stream of the site. A number of leachate seeps were also sampled. Subsurface soil samples were taken for analysis from the bottom of selected pits and well boreholes.

In addition to contaminants found in subsurface soils, several contaminants were also found in excess of New York State standards, guidance values or criteria in both the groundwater within or immediately adjacent to the landfill mass and the surface waters (primarily aluminum and iron) and its sediments (primarily manganese and zinc). However, analysis of samples drawn from private water supply wells in the vicinity of the landfill and offsite monitoring wells did not indicate contamination attributable to the landfill. The State Department of Health has informed residents that the sampled sources were safe for human consumption. The remedy selected in Section VIII of this document will lessen the impacts of the landfill to surface and groundwaters and provide for collection and treatment of groundwater if monitoring data or new information warrant this additional action.

To further quantify the potential hazard posed by this site, a Baseline Risk Assessment was performed. The risk assessment evaluated the potential impacts on human health assuming that no remediation occurred. Indicator chemicals were selected based on their known or potential toxicity and relative environmental fate and mobility characteristics.

The preliminary baseline Health Risk Assessment indicated that the ingestion pathway for groundwater located on site was associated with the greatest theoretical upper bound carcinogenic risk (3.8×10^{-4}) for all pollutants combined. However, this risk would only be possible if a drinking water well was installed on site. Chronic health hazards

were not shown to be of a significant concern. Health hazard ratios for all individual scenarios were less than 1.0 except for ingestion of landfill leachate. A Supplemental Health Risk Assessment was prepared based on consideration of Phase I RI results and on evaluation of data generated during Phase II. The Supplemental Assessment concluded that the Risk Assessment based on Phase I data represents an upper-bound assessment of risks that are applicable to Phase II data.

Physically, the landfill was found to be comprised of two large waste masses that appear municipal in nature separated by Tributary No. 20 to the Shawanqunk Kill. The waste mass and underlying aquifer are hydraulically connected with a portion of the waste mass located below the water table.

The landfill waste mass was found to range from 3 inches to approximately 20 feet below grade. The "in-place" waste quantities were estimated to be approximately 135,000 cubic yards, including an estimated 15,000 of existing cover soil on the west section and approximately 175,000 cubic yards, including an estimated 20,000 cubic yards of cover soil on the east section.

A description of the remedial investigation study and its findings can be found in the documents listed in Appendix C.

IV. Enforcement Status

In a Consent Order, fully executed on July 12, 1989, the Town agreed to remediation of the entire site. Up to 75% of eligible remedial costs may be reimbursed to the Town per an EQBA Title 3 State Assistance Contract.

In direct response to public concerns, an investigation by Assemblyman Maurice Hinchey and the NYSDEC Bureau of Environmental Conservation Investigation (BECI) is being conducted. Information developed from these investigations will be assessed and additional actions taken as warranted.

V. Goals for the Remedial Action

The overall remedial goal is to achieve a remedy which best fits the following criteria:

1. Is protective of both human health and the environment.

2. Obtains compliance with State standards, criteria and guidance.

3. Minimizes short-term impacts.

4. Maximizes long-term effectiveness and performance.

5. Is technically and administratively implementable.

6. Reduces the toxicity, mobility or volume of contaminants.

7. Is cost-effective.

In the selection of a remedy, the following hierarchy of remedial technologies are considered. They are listed in descending order of desirability:

1. Irreversible destruction or detoxification of all or most of the hazardous wastes to "acceptable clean-up levels."

2. Permanent and significant reduction in the volume of waste mixed with hazardous wastes.

3. Permanent and significant reduction in the mobility of the hazardous wastes.

4. Significant reduction in the toxicity of the hazardous wastes.

5. Off-site land disposal of the hazardous waste.

The landfill is composed of substantial quantities of municipal solid waste mixed with possibly lesser quantities of hazardous wastes. As a result of this finding the Division of Hazardous Waste Remediation's TAGM No. HWR-92-4044, Accelerated Remedial Actions at Class 2 Non-RCRA Landfills, was considered applicable to the Wallkill site. The strategy calls for the evaluation of the following source control and treatment technologies:

1. At a minimum placement of a final cover (capping) in accordance with 6 NYCRR Part 360 must be part of the final remedy. Thus significant reduction in the mobility of the hazardous waste provides the best fit of the seven point criteria stated above for a large municipal landfill.

2. Leachate collection is to be provided as part of the remedy where applicable. Leachate, where collected, is to be treated to meet the appropriate SCG discharge limits.

Based on the findings of the Remedial Investigation the remedial response objectives for the Wallkill landfill site are to:

1. Reduce the volume of leachate generated by the landfill;

2. Eliminate the potential risk associated with direct human or animal contact with any active leachate seeps and;

3. Ensure that continued protection of human health and the environment is maintained both on and off site.

VI. Summary of the Evaluation of the Alternatives

Concurrent with conducting the remedial investigation general response actions and potentially effective technologies were evaluated. The remedial action alternatives were developed by assembling combinations of effective technologies.

Using DHWR's TAGM No. HWR-92-4044, Accelerated Remedial Actions at Class 2 Non-RCRA Landfills as guidance, the identified effective technologies were further screened to identify the appropriate technologies for each of the elements called for under the TAGM. The general response actions along with the technologies considered are documented in the Feasibility Study documents listed in Appendix C.

The identified media specific technologies were assembled into four remedial alternatives:

Alternative 1: No Action with Monitoring

Capital Cost:	$208,000
Annual O&M Cost:	$ 18,800
Present Worth Cost:	$630,000
Time to Implement:	Less than a year

Alternative 1 is the no-action alternative. This alternative would provide for a five-year assessment of environmental conditions if no remedial actions are implemented. The purpose of five-year reviews is to ensure that adequate protection of human health and the environment is maintained. Alternative 1 would rely on natural degradation of the waste mass to reduce certain chemical constituents. Land use restrictions would prohibit the use of groundwater on the site for other than sampling purposes. This alternative provides for the construction of a perimeter fence and the installation of gas monitoring wells and provides for long-term monitoring of groundwater and landfill gas.

Alternative 2:

(a) Consolidation of the Western Waste Mass and removed surface water sediments onto the Eastern Waste Mass; (b) Installation of a low permeable cover of the consolidated waste mass; (c) Collection and venting of landfill gas; (d) Stream diversion on-site; (e) Construction of a perimeter fence and long-term monitoring of groundwater and landfill gas; (f) Limited removal of surface water sediments and excavation of waste mass 50 feet from the stream centerline in selected areas.

Capital Cost:	$6,945,000
Annual O&M Cost:	$ 34,000
Present Worth Cost:	$9,343,000
Time to Implement:	2 Years

This alternative would provide containment through the installation of a landfill cap. A reduction of infiltration will reduce the impact of leachate on groundwater. Once a cap is installed, there will be no direct releases of leachate to surface water. Since capping will significantly alter the volume and nature of landfill gas and leachate, five-year reviews will be conducted to ensure that adequate protection of human health and the environment is maintained. Consolidation of the waste mass could provide for limited landfill mining and further assure that deposits of hazardous waste do not exist within the Western Waste Mass area. Stream diversion would isolate Tributary No. 20 from landfill leachate. Land use restrictions would prohibit the use of groundwater on the site for other than sampling purposes.

Alternative 3:

(a) Minor consolidation of certain waste masses on-site;
(b) Installation of a low permeable cover over the waste mass;
(c) Collection and venting of landfill gas with provisions made during design to allow conversion from a passive to an active venting system if warranted;
(d) Limited stream sediment removal and excavation of the waste mass away from the stream and property line in certain areas;
(e) Long-term monitoring of the near site drinking water, surface water, groundwater and landfill gas with a Contingency Action Plan.

Capital Cost:	$5,873,000
Annual O&M Cost:	$ 34,000
Present Worth Cost:	$7,088,000
Time to Implement:	1 Year

This alternative would provide for the same remedial plan as Alternative 2 except that neither the Western Waste Mass nor the existing stream path would be moved. In the areas where groundwater is discharging to the stream, contaminants may still enter the tributary, but at a reduced rate due to the landfill cap. It is expected that surface water quality will not be adversely impacted by this small rate of contaminant release. This will be confirmed through the long-term monitoring program. All discharges of surface leachate to surface water will be eliminated. Land use restrictions would prohibit the use of groundwater on the site for other than sampling purposes.

The Contingency Action Plan will provide for implementation of further groundwater controls (collection and treatment) if long-term monitoring demonstrates that the final cover alone does not satisfactorily control any future off-site releases which would pose a threat to human health or the environment. Should constituents possibly now in the waste mass appear in the monitoring wells outside the waste mass in exceedance of groundwater standards which would pose a threat to human health or the environment, the Contingency Action Plan would be implemented. The Plan will contain explicit criteria which will trigger additional remedial actions, timeframes for action and performance requirements for additional remedies to meet.

Alternative 4: Groundwater collection and treatment in addition to all the elements identified in Alternative #3.

Capital Cost:	$6,368,000
Annual O&M Cost:	$ 148,000
Present Worth Cost:	$9,010,000
Time to Implement:	17 Years

This alternative would provide for the same remedial plan as Alternative 3 except that groundwater in contact with the waste mass would be collected, pumped, and then treated prior to discharge to Tributary No. 20. Although groundwater treatment is considered to provide for an irreversible reduction of the toxicity, mobility or volume of pollutants, effective groundwater collection on this site may prove difficult to achieve and additional study with on site tests may be necessary. Based on the remedial investigation, no adverse environmental or human health impacts from groundwater have been demonstrated if the groundwater is not collected and treated.

Each of the four identified alternatives were individually assessed and then compared to identify the remedial plan which best achieves the remedial objectives and goals discussed above. This analysis can be found in the Feasibility Study documents listed in Appendix C.

VII. CITIZEN PARTICIPATION

There has been significant public interest by the residents in the immediate vicinity of the site throughout the entire remedial process. The following chronology summarizes the public informational meetings:

February 14, 1990: Public Meeting concerning RI/FS work plans.

April 4, 1991: Public Meeting to present the Phase I RI Report and to discuss implementation of New York's "Strategy for Early Remedial Measures "(Landfill Cap).

February 6, 1992: Public Meeting to present the RI/FS and the PRAP.

A Citizen Participation (CP) Plan was developed and implemented by the Town of Wallkill with input, by the NYSDEC. William F. Cosulich Associates were retained to assist the Town with the program. Major reports were placed in document repositories in the vicinity of the site and made available for public review. A public contact list was developed and used to distribute fact sheets and meeting announcements.

VIII. SUMMARY OF THE GOVERNMENT'S DECISION

Based upon the results of the RI/FS and the criteria for selecting a remedy, the NYSDEC has selected the major elements of Alternative 3 to remediate the site.

The major elements of the selected remedy include:

- Excavation of the stream banks from the center line of the stream in selected on-site areas, disposal of the excavated waste, soils, and stream sediments on the existing landfill property and backfilling of the excavated area with clean fill. Removal, consolidation and regrading of wastes on the landfill and along its perimeter will be done as required for cap construction and for prevention of gas migration.

- Capping of the existing landfill with an associated landfill gas venting system as required by 6 NYCRR Part 360 regulations. Installation of a leachate monitoring system. Provisions will be made during design to allow conversion from a passive to an active gas venting system if warranted by long-term monitoring. Design of the remedy will include a contingency for disposal of removable quantity of materials which are discovered during additional field investigations or during construction.

- Temporary stream diversion and removal of contaminated surface water sediments in the area of stream embankment excavation. Disposal of removed sediments in the existing landfill.

- Installation of a posted fence around the perimeter of site.

- Preparation and Implementation during design of a long-term Maintenance and Monitoring Plan which will include additional monitoring wells. Near site drinking water, groundwater, surface water and landfill gas will be monitored for a minimum of 30 years and will include reevaluation of the site remedy every five years. Additional monitoring wells and sampling points will be established as the need is identified. This plan will make provision for consideration of new information as it is received and provide for a continuing public participation program with a yearly report on the status of the site for a minimum of five years, to be extended as necessary.

- Preparation of a Contingency Action Plan which will provide for implementation of groundwater controls (collection and treatment) or other remedial measures if long-term monitoring or additional information demonstrate that the final cover alone does not satisfactorily control any future off-site

releases of hazardous substances. Should substances possibly now in the waste mass appear in the monitoring wells outside the waste mass in exceedance of standards which would pose a threat to human health or the environment, the Contingency Action Plan would be implemented.

- o Institution of land use restrictions on-site to prevent disturbance of the cap and prohibit the use of groundwater on the site for other than sampling purposes.

- o The constructed cover will be designed to accommodate future construction of groundwater capture and treatment.

This action is protective of human health and the environment and provides a reasonable balance when the criteria of cost, short-term impacts, long-term effectiveness and performance, implementability, reduction in toxicity, mobility and volume, and compliance with New York State standards guidance and criteria are considered. By including the Contingency Action Plan, this remedy has the flexibility to incorporate additional information in the future from long-term monitoring of the site or other sources.

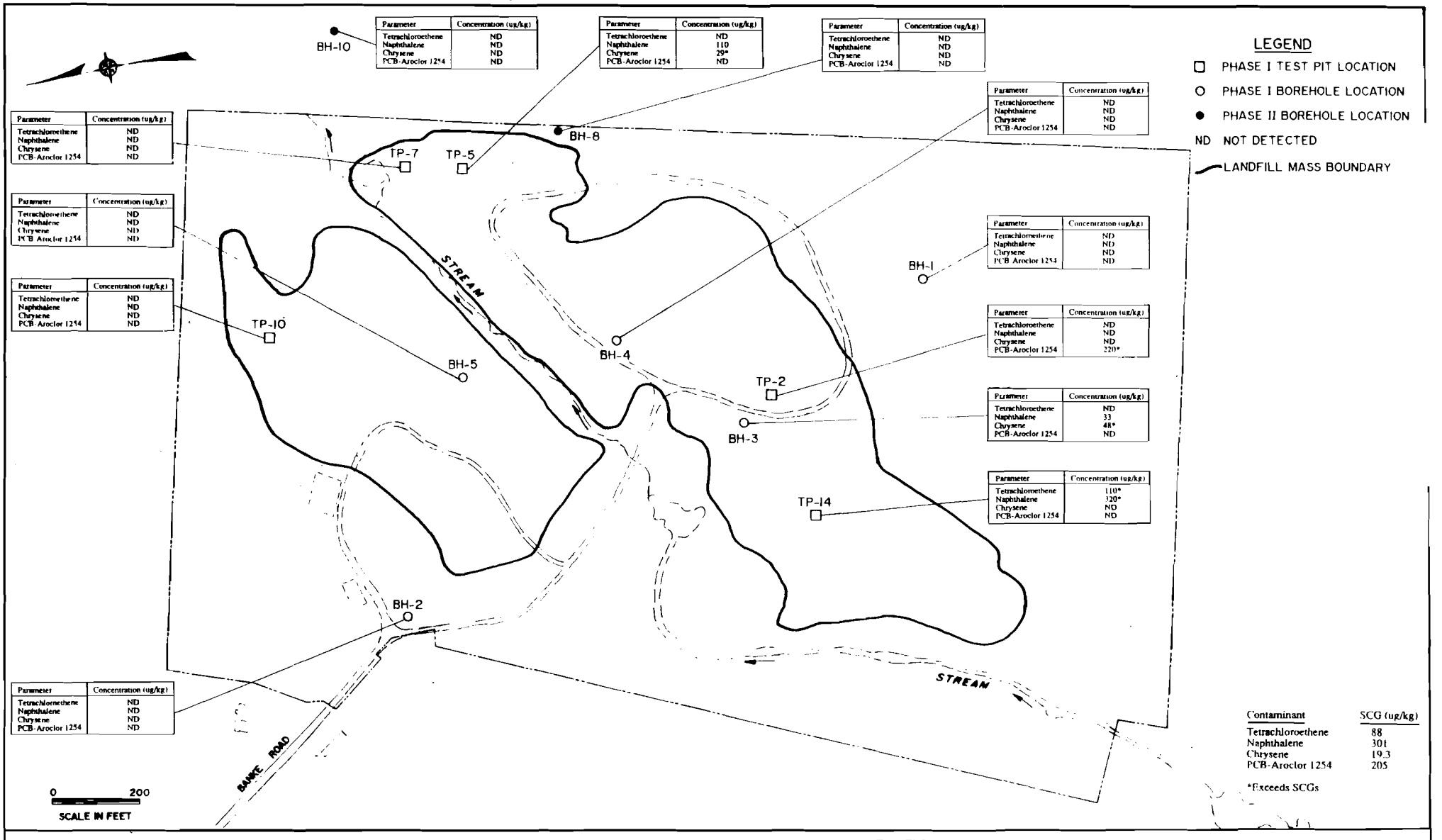
APPENDIX A

TABLE 1

NEW YORK STATE STANDARDS, CRITERIA AND GUIDANCE
APPLICABLE TO THE WALLKILL LANDFILL SITE
#336017

Statute, Regulation or Program	Category
NYSDEC TOGS 1.1.1-Ambient Water Quality Standards and Guidance Values	Action-specific Contaminant-specific Location-specific (point of discharge classification)
NYSDOH Requirements for General Organic Chemicals in Drinking Water (PHL; Sections 201 and 205)	Contaminant-specific
NYSDEC Air Guide-1	Action-specific Contaminant-specific
NYSDEC DHWR - Soil Cleanup Criteria	Action-specific Contaminant-specific Location-specific
NYSDEC DFW - Sediment Criteria	Contaminant-specific Location-specific
NYSDEC Hazardous Waste Treatment Storage and Disposal Facility Permitting Requirements (6NYCRR Part 373)	Action-specific Contaminant-specific
NYSDEC Solid Waste Management Facilities (6NYCRR Part 360)	Action-specific
NYSDEC Freshwater Wetlands Requirements (ECL Articles 24 and 71, Title 23)	Action-specific Location-specific
Eastern United States Background Concentrations of Twenty Elements in Soils	Contaminant-specific
Safe Drinking Water Act/USEPA Health Advisories (40 CFR Parts 141, 142, and 143)	Contaminant-specific

Statute, Regulation or Program	Category
Resource Conservation and Recovery Act-Groundwater Protection Standards (40 CFR Part 264.90-264.109)	Contaminant-specific
Clean Water Act-Ambient Water Quality Criteria (EPA 44/5-86-001)	Contaminant-specific Location-specific
Toxic Substances Control Act (40 CFR Part 702-799)	Contaminant-specific
USEPA Health-Based Soil Criteria for Systemic Toxicants and Carcinogens	Contaminant-specific
OSHA Standards (29 CFR 1900-1999)	Action-specific Contaminant-specific Location-specific
U.S. Army Corps of Engineers Dredge and Fill Departments (CWA, Section 404)	Action-specific Location-specific



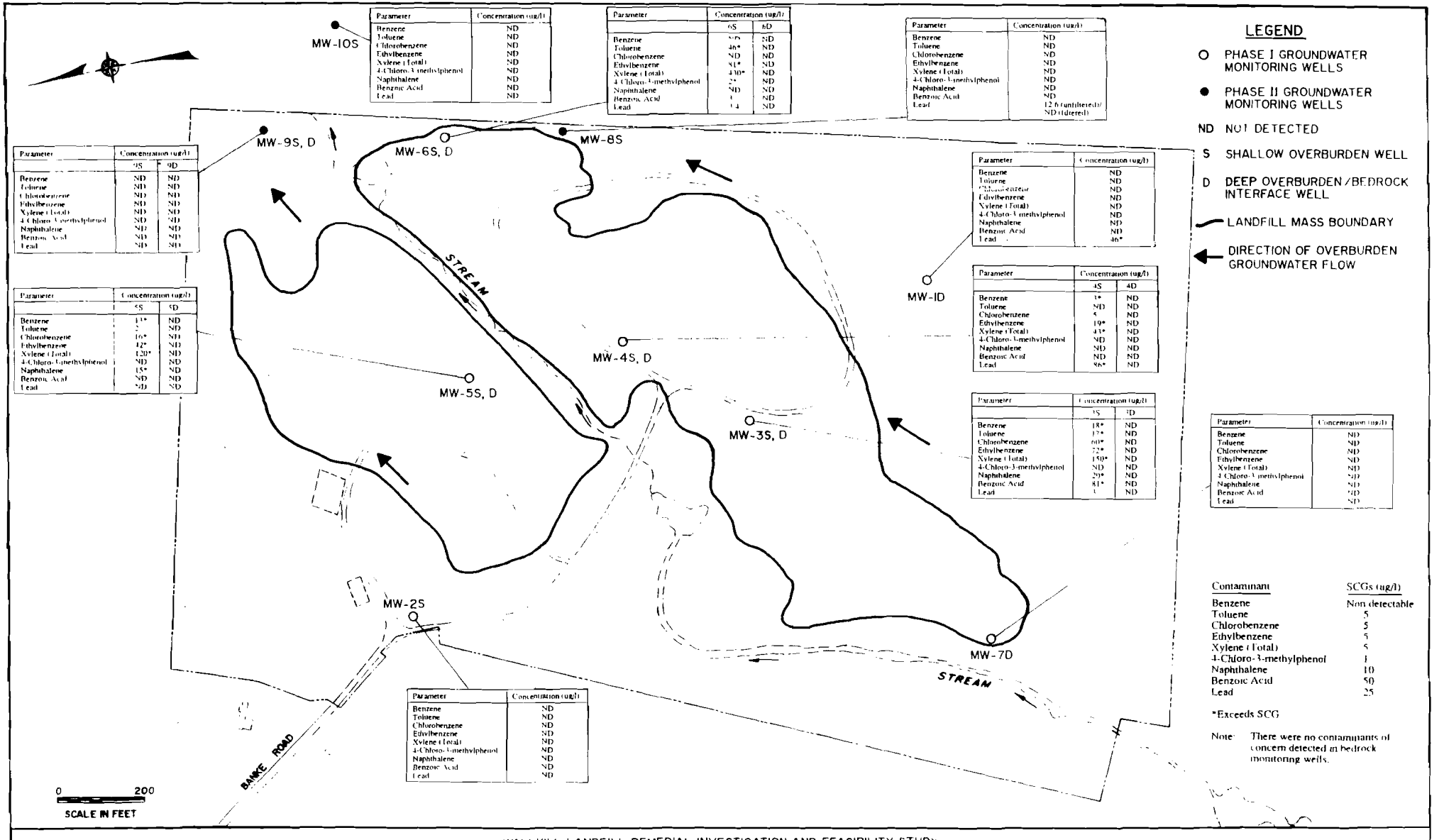
WALLKILL LANDFILL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
TOWN OF WALLKILL, ORANGE COUNTY, NEW YORK

WILLIAM F. COSULICH ASSOCIATES, P.C.
ENVIRONMENTAL ENGINEERS

CONTAMINANTS OF CONCERN DETECTED IN SUBSURFACE SOILS

FIGURE 4-1

APPENDIX B



Parameter	Concentration (ug/l)
Benzene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Xylene (Total)	ND
4-Chloro-3-methylphenol	ND
Naphthalene	ND
Benzoic Acid	ND
Lead	ND

Parameter	Concentration (ug/l)	
	6S	6D
Benzene	ND	ND
Toluene	46*	ND
Chlorobenzene	ND	ND
Ethylbenzene	51*	ND
Xylene (Total)	430*	ND
4-Chloro-3-methylphenol	25	ND
Naphthalene	ND	ND
Benzoic Acid	[illegible]	ND
Lead	1.4	ND

Parameter	Concentration (ug/l)
Benzene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Xylene (Total)	ND
4-Chloro-3-methylphenol	ND
Naphthalene	ND
Benzoic Acid	ND
Lead	12.6 (unfiltered)/ ND (filtered)

Parameter	Concentration (ug/l)	
	9S	9D
Benzene	ND	ND
Toluene	ND	ND
Chlorobenzene	ND	ND
Ethylbenzene	ND	ND
Xylene (Total)	ND	ND
4-Chloro-3-methylphenol	ND	ND
Naphthalene	ND	ND
Benzoic Acid	ND	ND
Lead	ND	ND

Parameter	Concentration (ug/l)
Benzene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Xylene (Total)	ND
4-Chloro-3-methylphenol	ND
Naphthalene	ND
Benzoic Acid	ND
Lead	46*

Parameter	Concentration (ug/l)	
	5S	5D
Benzene	13*	ND
Toluene	5	ND
Chlorobenzene	16*	ND
Ethylbenzene	42*	ND
Xylene (Total)	120*	ND
4-Chloro-3-methylphenol	ND	ND
Naphthalene	15*	ND
Benzoic Acid	ND	ND
Lead	ND	ND

Parameter	Concentration (ug/l)	
	4S	4D
Benzene	1*	ND
Toluene	ND	ND
Chlorobenzene	4	ND
Ethylbenzene	19*	ND
Xylene (Total)	41*	ND
4-Chloro-3-methylphenol	ND	ND
Naphthalene	ND	ND
Benzoic Acid	ND	ND
Lead	86*	ND

Parameter	Concentration (ug/l)	
	7S	7D
Benzene	18*	ND
Toluene	17*	ND
Chlorobenzene	60*	ND
Ethylbenzene	22*	ND
Xylene (Total)	150*	ND
4-Chloro-3-methylphenol	ND	ND
Naphthalene	20*	ND
Benzoic Acid	81*	ND
Lead	1	ND

Parameter	Concentration (ug/l)
Benzene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Xylene (Total)	ND
4-Chloro-3-methylphenol	ND
Naphthalene	ND
Benzoic Acid	ND
Lead	ND

Parameter	Concentration (ug/l)
Benzene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Xylene (Total)	ND
4-Chloro-3-methylphenol	ND
Naphthalene	ND
Benzoic Acid	ND
Lead	ND

Contaminant	SCGs (ug/l)
Benzene	Non detectable
Toluene	5
Chlorobenzene	5
Ethylbenzene	5
Xylene (Total)	5
4-Chloro-3-methylphenol	1
Naphthalene	10
Benzoic Acid	50
Lead	25

*Exceeds SCG

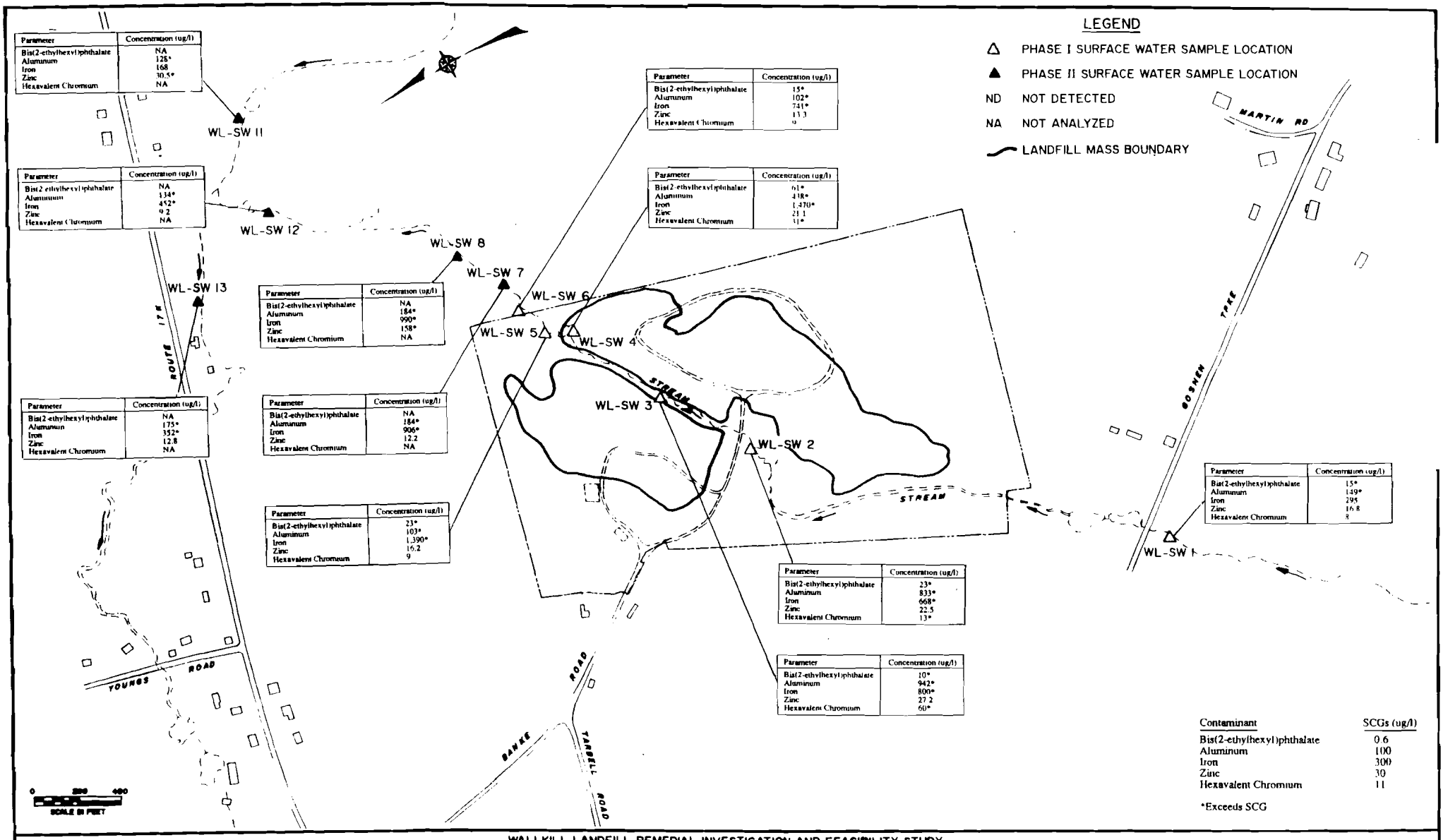
Note: There were no contaminants of concern detected in bedrock monitoring wells.

WALLKILL LANDFILL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
TOWN OF WALLKILL, ORANGE COUNTY, NEW YORK

CONTAMINANTS OF CONCERN DETECTED IN GROUNDWATER

WILLIAM F. COSULICH ASSOCIATES, P.C.
ENVIRONMENTAL ENGINEERS

FIGURE 4-2



Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	NA
Aluminum	125*
Iron	168
Zinc	30.5*
Hexavalent Chromium	NA

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	NA
Aluminum	134*
Iron	452*
Zinc	9.2
Hexavalent Chromium	NA

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	NA
Aluminum	175*
Iron	352*
Zinc	12.8
Hexavalent Chromium	NA

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	NA
Aluminum	184*
Iron	990*
Zinc	158*
Hexavalent Chromium	NA

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	NA
Aluminum	184*
Iron	906*
Zinc	12.2
Hexavalent Chromium	NA

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	23*
Aluminum	103*
Iron	1,390*
Zinc	16.2
Hexavalent Chromium	9

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	15*
Aluminum	102*
Iron	741*
Zinc	13.3
Hexavalent Chromium	9

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	91*
Aluminum	418*
Iron	1,470*
Zinc	21.1
Hexavalent Chromium	11*

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	23*
Aluminum	833*
Iron	668*
Zinc	22.5
Hexavalent Chromium	13*

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	10*
Aluminum	942*
Iron	800*
Zinc	27.2
Hexavalent Chromium	60*

Parameter	Concentration (ug/l)
Bis(2-ethylhexyl)phthalate	15*
Aluminum	149*
Iron	295
Zinc	16.8
Hexavalent Chromium	8

Contaminant	SCGs (ug/l)
Bis(2-ethylhexyl)phthalate	0.6
Aluminum	100
Iron	300
Zinc	30
Hexavalent Chromium	11

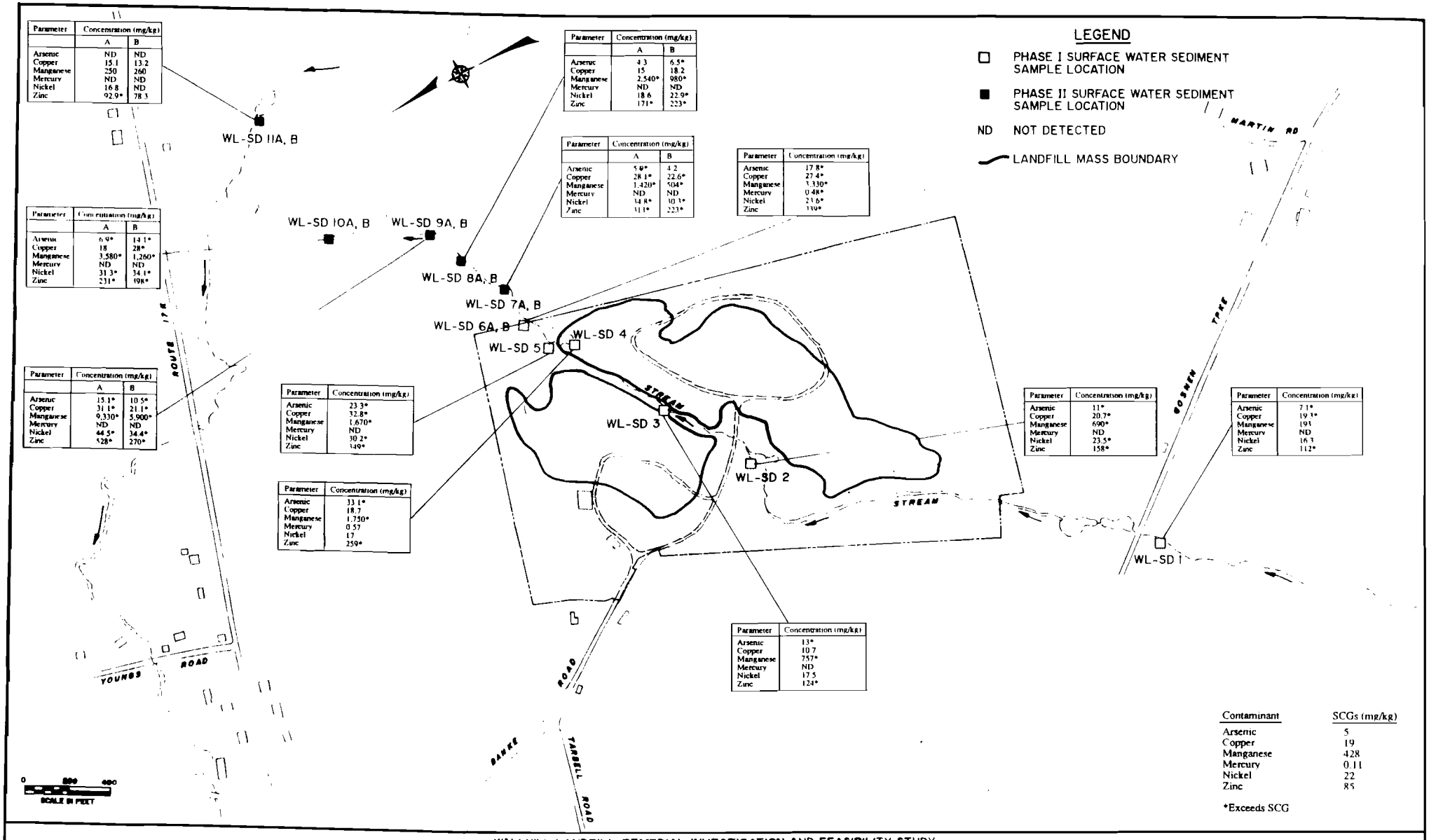
*Exceeds SCG

WALLKILL LANDFILL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
TOWN OF WALLKILL, ORANGE COUNTY, NEW YORK

CONTAMINANTS OF CONCERN DETECTED IN SURFACE WATERS

WILLIAM F. COSULICH ASSOCIATES, P.C.
ENVIRONMENTAL ENGINEERS

FIGURE 4-3



Parameter	Concentration (mg/kg)	
	A	B
Arsenic	ND	ND
Copper	15.1	13.2
Manganese	250	260
Mercury	ND	ND
Nickel	16.8	ND
Zinc	92.9*	78.3

Parameter	Concentration (mg/kg)	
	A	B
Arsenic	4.3	6.5*
Copper	15	18.2
Manganese	2,540*	980*
Mercury	ND	ND
Nickel	18.6	22.0*
Zinc	171*	223*

Parameter	Concentration (mg/kg)	
	A	B
Arsenic	5.9*	4.2
Copper	28.1*	22.6*
Manganese	1,420*	504*
Mercury	ND	ND
Nickel	34.8*	40.3*
Zinc	311*	223*

Parameter	Concentration (mg/kg)
Arsenic	17.8*
Copper	27.4*
Manganese	1,330*
Mercury	0.48*
Nickel	21.6*
Zinc	339*

Parameter	Concentration (mg/kg)	
	A	B
Arsenic	6.9*	14.1*
Copper	18	28*
Manganese	3,580*	1,260*
Mercury	ND	ND
Nickel	31.3*	34.1*
Zinc	231*	198*

Parameter	Concentration (mg/kg)	
	A	B
Arsenic	15.1*	10.5*
Copper	31.1*	21.1*
Manganese	9,330*	5,900*
Mercury	ND	ND
Nickel	44.5*	34.4*
Zinc	528*	270*

Parameter	Concentration (mg/kg)
Arsenic	23.3*
Copper	32.8*
Manganese	1,670*
Mercury	ND
Nickel	30.2*
Zinc	349*

Parameter	Concentration (mg/kg)
Arsenic	33.1*
Copper	18.7
Manganese	1,750*
Mercury	0.57
Nickel	17
Zinc	259*

Parameter	Concentration (mg/kg)
Arsenic	11*
Copper	20.7*
Manganese	690*
Mercury	ND
Nickel	23.5*
Zinc	158*

Parameter	Concentration (mg/kg)
Arsenic	7.1*
Copper	19.1*
Manganese	191
Mercury	ND
Nickel	16.1
Zinc	112*

Parameter	Concentration (mg/kg)
Arsenic	13*
Copper	10.7
Manganese	757*
Mercury	ND
Nickel	17.5
Zinc	124*

Contaminant	SCGs (mg/kg)
Arsenic	5
Copper	19
Manganese	428
Mercury	0.11
Nickel	22
Zinc	85

*Exceeds SCG

WALLKILL LANDFILL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
TOWN OF WALLKILL, ORANGE COUNTY, NEW YORK

WILLIAM F. COSULICH ASSOCIATES, P.C.
ENVIRONMENTAL ENGINEERS

CONTAMINANTS OF CONCERN DETECTED IN SURFACE WATER SEDIMENTS

FIGURE 4-4

APPENDIX C

List 1

Document Description	Date
Town of Wallkill Landfill Evaluation Study William F. Cosulich Associates, P.C.	March 1983
Town of Wallkill Final Report on the Excavation and Removal of Buried Drums Chemical Waste Management, Inc. ENRAC Division	November 1986
Project Completion Report Excavation and Removal of Buried Drums from the Former Town of Wallkill Landfill, Orange County, New York William F. Cosulich Associates, P.C.	April 1987
Background Information Report Regarding Environmental Conditions at the Town of Wallkill Landfill William F. Cosulich Associates, P.C.	August 1989
Order on Consent Case #W3-0338-89-06	July 12, 1989
Environmental Quality Bond Act State Assistance Contract	February 15, 1990
Public responsiveness summary concerning the Proposed Remedial Action Plan (PRAP)	
Phase I/II Remedial Investigation Report prepared by William F. Cosulich Associates, P.C. (WFC)	
Baseline Human Health Risk Assessment Remedial Investigation and Feasibility Study prepared by (WFC)	
Supplemental Health Risk and Environmental Assessment prepared by (WFC)	
Phase III Feasibility Study Detailed Analysis of Alternatives prepared by (WFC)	
Closure Alternatives Supplement to Preliminary Phase II/III Feasibility Study prepared by (WFC)	

RESPONSIVENESS SUMMARY

Wallkill Landfill Inactive Hazardous Waste Site (336017)

INTRODUCTION:

The issues and questions addressed in the following Responsiveness Summary were raised during a public meeting held by the New York State Department of Environmental Conservation (DEC) on March 6, 1992 at the Wallkill Town Hall in Middletown, New York and in various letters received during a 30 day public comment period. The purpose of the meeting was to discuss the results of the Remedial Investigation/Feasibility Study (RI/FS) of the Wallkill Town Landfill Inactive Hazardous Waste Site (#336017) and receive comments on DEC's Proposed Remedial Action Plan (PRAP) for the site. Representatives of the DEC, the New York State Department of Health (DOH) and the Town of Wallkill were present at the meeting.

The following written comments were received regarding the proposed remedy:

Nancy Navikas, Bloomingburg, New York
Donald Bailey Tirrell, Cicleville, New York
Liana Hoodes (Orange Environment) Goshen, New York
Dan Miner (Orange Environment) Goshen, New York
Morten Westblad Nyberg, Johnson, New York

The following correspondence regarding the Orange Loop Authority Project and incineration in Orange County, contain comments on the Wallkill Landfill:

Donald Bailey Tirrell, Circleville, New York dated June 14, 1991; April 15, 1990; April 12, 1991, May 8, 1991 and an undated letter to Mr. Louis Mills.

Two videotapes, prepared by Mr. Don Tirrell, were presented to DEC during the comment period. One of the videotapes, entitled "A Crime Against Humanity" was presented during the February 6, 1992 public meeting. Both tapes identified questions and issues for consideration during the final selection of the site remedy.

QUESTIONS AND RESPONSES:

The Responsiveness Summary is organized around several issues that were raised repeatedly during the public meeting, in written comments and in the videotapes. A response is provided for each issue. In addition, specific questions, comments and responses are arranged in accordance with the issues that they pertain to. Some questions and comments do not pertain to a particular issue category and are responded to in a section labeled "Miscellaneous Items".

NOTE: Questions are designated by "Q", comments by "C" and responses by"R". Responses that are marked with an asterisk (*) indicate actions thatwere taken by DEC, DOH and/or the Town of Wallkill following the public meeting and comment period.

Issue 1: The final remedy for the site should not be selected at this time because the site has not been adequately investigated. The methodology and conclusions of the RI/FS are suspect due to the failure to investigate information provided by residents regarding past site operations.

Response: The testing that was done during the RI/FS was comprehensive and considered adequate to determine the type and extent of contamination at the landfill. The types of investigations that were performed, i.e. test pits, surface and groundwater samples provided data that was representative of the site conditions as they are today.

Any information regarding the site that may lead to additional investigations and/or a different remedial action is welcome. The remedial action plan makes provision for consideration of new information if received.

* An additional investigation of the landfill was conducted by DEC, DOH and the Town of Wallkill during the week of May 18, 1992. On-site testing included samples from groundwater monitoring wells and surface water. Additional samples were taken from the surface water and sediment in two ponds north of Rte 17K. Additional test pits were excavated based on information gathered from former landfill operators and others familiar with the site, including those interviewed on the videotapes.

Q: If there is new information concerning the site that is brought to light, will additional opportunities for public input be provided?

R: Yes. If the remedial action that is proposed is significantly altered, the public will have an opportunity to discuss and comment on the changes. No significant changes will be made until after the public comments are taken into account.

The selection of the remedial alternative will not mark the end of citizen participation at the site. Public participation will continue through the design and construction of the remedial action and during the operation and maintenance program.

Q: If there is more information being evaluated in the future, based on a continuing monitoring program and the recent information DEC received before the public meeting, why is the remediation plan being finalized now?

R. Construction of the landfill cap is not anticipated to begin until the spring of 1993. The design of the cap will include provisions for contingency measures such as a groundwater collection and treatment system. Data that will be gathered during this period can be evaluated with enough time to change the remedial action or add contingency plans if necessary. If the results of additional investigations indicate that the chosen remedial action remains the appropriate selected clean-up, the remediation of the landfill is one year closer to completion.

C: All the important questions such as who dumped, what did they dump, where and when was it dumped, were not adequately answered by the RI/FS. The investigation should return to the RI/FS before any Record of Decision (ROD) is signed.

R: There is no need to re-start the RI/FS. After the ROD is signed, the design of the remedial action will take a minimum of one year to implement, during which time any additional information will be evaluated. There is enough time in this remedial process to change the remedial action if necessary while moving ahead with addressing the contamination at the site. Efforts to identify responsible parties and what they contributed to the site is ongoing.

Q: The DEC and the Town of Wallkill should investigate information from the public regarding landfill operations that was submitted during the public meetings. Why is the burden of proof on the citizens to come forward and not on the DEC or the Town to do the proper research?

R: It is the intent of the DEC and the Town of Wallkill to gather all information which may assist the investigation of the site. Citizen participation at inactive hazardous waste sites involves two-way communication; the Town of Wallkill informs the public about the site and receives information, suggestions and comments from the public. It is important for the success of the program that the public's concerns and opinions are heard, understood and considered during the remedial process. Local residents often provide important information concerning the history of a site. Any information that the public has to share only improves and advances the site investigation.

In some instances, information provided by the public can assist in identifying persons potentially responsible for the site, as well as identifying types and quantities of waste. To be useful, the

information needs to be specific enough to identify chemicals and potential locations of waste.

* Information regarding the site received from the public is being considered and an additional investigation of the landfill was conducted in May 1992 using this information.

DEC is also proposing to work with the Town of Wallkill to enhance the citizen participation program at the site. The Citizen Participation Plan that was created for the site should be updated to include activities during the design/implementation of the remedial action as well as the operation and maintenance stages of the remedial program.

Q: I was walking through the woods recently and saw half-buried drums along some of the wooded areas on the edge of the landfill. Would DEC like a copy of the videotape I made?

R: Yes, DEC would be interested in any new information concerning the site. Information should be forwarded to the Director, Region 3, 21 South Putt Corners Road, New Paltz, New York.

Issue 2: Allegations of illegal dumping need to be thoroughly investigated to obtain information on what chemicals were potentially placed in the landfill and by whom. A detailed investigation may reveal potentially responsible parties (PRPs) that will fund the cleanup of the site.

Response: Allegations of hazardous waste disposal are being investigated by the Town of Wallkill and the DEC.

Q: The Town of Wallkill identified three PRPs including Tuck Industries, Tanatex Sybron and Hooker Chemical. Are there any investigations of these companies and what chemicals they used?

R: Again, the investigation of any PRP is being handled by the Town of Wallkill and the DEC. The investigation is on-going and cannot be discussed at this time.

Q: What is being tested for when monitoring wells are sampled?

R: The sampling of wells includes the "full target compound list" which contains 129 compounds and metals. The tests used are broad scan and can identify traces of individual compounds, although there are classes of compounds which are not identified by the tests. The tests are designed to identify a range of commonly used industrial chemicals. Approximately 150 specific chemicals, general chemical parameters that indicate the presence of landfill leachate, and the presence of other materials known as tentatively identified coumpounds (TICs), are searched for.

C: General tests like the "full target compound list" may miss individual compounds that are not on this "list". Rigorous research into the site operations and interviews with former landfill workers need to be conducted to identify PRPs and the types of chemicals the PRPs dumped in the landfill. When specific chemicals are identified from this investigation, DEC and the Town can test for those specific chemicals.

R: In addition to a "full target compound list," a gas chromatograph/mass spectrometer was used to look for additional compounds known as tentatively identified compounds (TICs). Whenever possible an attempt to identify and assess the significance of TICs is made. Although only partial success at identifying unknowns may be achieved, an estimate on the amount and nature of the contamination to assess risk can be made.

* During the supplemental investigation, landfill workers were interviewed to obtain information on PRPs and the types of chemicals they dumped in the landfill. Since information is often sketchy, tests for the target compounds and TICs are used to understand the nature of the site contamination.

Issue 3: Placing a cap on the landfill with a 30 year monitoring program is only a temporary solution. This remedial option only postpones dealing with the situation; it does not effectively eliminate the threat posed by the site.

Response: In the hazardous waste remediation program, there is a hierarchy of remedial actions that are considered during the feasibility study. The foremost remedy is to destroy or eliminate the hazardous waste entirely. If this remedy is not feasible, based on the information gathered during the remedial investigation, other remedies are evaluated that will be protective of human health and the environment.

Given the large volume of municipal waste present in the landfill, the proposed capping system is a viable remedial alternative. The purpose of the cap is to eliminate migration of rainfall through the landfill to the maximum extent possible. The precipitation would run off to a surface water drainage system. The ROD requires capping of the existing landfill with an associated landfill gas venting system as required by 6 NYCRR Part 360 regulations and installation of a leachate monitoring system. Provisions will be made during design to allow conversion from a passive to an active gas venting system if warranted by long-term monitoring. Design of the remedy will include a contingency for disposal of removable quantity of materials which are discovered during additional field investigations or during construction.

Provisions will be made for temporary stream diversion and excavation of the stream banks and surface water sediments in selected on site areas. Installation of a posted fence around the perimeter of site will also be required.

* The proposed capping system will effectively remediate the contamination identified in the RI/FS. The final remedial plan includes contingency actions that may be implemented if the monitoring program indicates that these additional measures must be taken to protect human health and the environment. The Contingency Action Plan will provide for implementation of groundwater controls (collection and treatment) or other remedial measures if long-term monitoring or additional information demonstrate that the final cover alone does not satisfactorily control any future off-site releases of hazardous substances. Should substances, possibly in the waste mass now, appear in the monitoring wells outside the waste mass in exceedance of standards which would pose a threat to human health or the environment, the Contingency Action Plan would be implemented.

C: Capping the landfill offers no assurance that toxics will not move under the cap, especially along Tributary 20. The toxics should be removed or real proof offered that they do not exist.

R: The RI/FS included an examination of the hydrogeology and hydrology of the site to determine the nature and extent of contamination in the groundwater and surface water. The study also examined the migration of contaminants in the groundwater under the landfill. While the results of these tests to date indicate that groundwater contamination exists on-site, the tests also indicate that there is no significant off-site migration of contaminants in the groundwater.

To monitor the possible future movement of contaminants, the remedial action calls for preparation and implementation of, during design, a long-term Maintenance and Monitoring Plan which will include additional monitoring wells. Near site drinking water, groundwater, surface water and landfill gas will be monitored for a minimum of 30 years and will include reevaluation of the site remedy every five years. Additional monitoring wells and sampling points will be established as needed.

If the monitoring program shows that the groundwater in the monitoring wells adjacent to the site has become contaminated and groundwater flow direction indicates that contamination may be moving towards residential wells, contingency measures such as a groundwater treatment system will be evaluated and placed at the site if deemed necessary.

Q: There is no leachate collection system on the cap and groundwater is potentially discharging into the area under the landfill. Are you confident that there will be no exchange through the groundwater?

R: There is always the potential for groundwater which has come into contact with waste material to carry contaminants off the site. As previously stated, existing data indicates that significant migration is not occurring. However, a monitoring plan will be implemented to detect change in the quality of groundwater and future remedial measures taken if necessary.

Q: Have different technologies been considered for remediating the entire site? Was removing the waste a consideration?

R: The capping alternatives that were presented in the feasibility study were the result of a selection process that evaluated many different remedial actions.

Technologies that were considered included incineration and removal of the garbage. These technologies were rejected as being too costly and potentially presenting a health risk during the removal. It would be very difficult and costly to remove all of the waste and either treat it or destroy it. The proposed remedial action, a cap with plans for contingency measures and a monitoring program, will most effectively remediate the threat posed by the landfill to human health and the environment. Note that total destruction of the landfill is not possible; soils and metals cannot be destroyed.

Q: How can you cap the landfill when it has a natural aquifer underneath it?

R: The landfill cap is designed to prevent water from infiltrating through the waste mass and carrying contaminants to the aquifer.

In addition, there are five different types of stream and glacially deposited sediments that have been recognized under the landfill. These sedimentary units vary in thickness over short horizontal distances. A large percentage of these sediments are mixed with fine grained silt particles which impede groundwater flow through these units beneath the site. The sedimentary units that contain coarse grained sand and gravel are surrounded by those units that impede groundwater flow. The result is that the area under the landfill has a reduced groundwater flow through the various sedimentary units. Capping the landfill will eliminate the vertical influx of water. The water level beneath the landfill will be starved.

Q: How long will the land use restrictions on the site be in place? Will these restrictions last with all the development around this area? If the 30 year monitoring program shows only scant traces of contaminants, will the restrictions be removed?

R: The intent of the restrictions is to stay on permanently, as long as the landfill is there. The Town is considering various options concerning the future use of the site. The Town will look into finding a future use of the site that is beneficial to the Town and is in accordance with the restrictions and guidelines set forth by the remedial action and pertinent regulations.

Issue 4: Officials are trying to "fast-track" the landfill cap to cover up potential illegal activities that may have occurred at the site.

Response: Any allegations of illegal activities involving the landfill are being investigated. The intention of a "fast-track" remediation is not to push a remediation without proper investigation of the site. Rather, the intention is to mitigate the major source of contamination posed by Class 2 landfills as early as possible. The Remedial Investigation/Feasibility Study (RI/FS) process for Class 2 sites requires the identification of feasible remedial technologies which are screened and then organized into various remedial alternatives. This process of identifying options to control the contamination source at Class 2 landfills such as Wallkill can be simplified and accelerated due to their typical large size and composition.

C: According to DEC's October 1991 document, "Draft Clean-up Policy & Guidelines," if a site has more toxic waste than garbage, the site must be returned to pre-release conditions. The amount of toxics in the landfill have been minimized so that the dump can be capped instead of being returned to pre-release conditions.

R: The "Draft Clean-up Policy & Guidelines" document is in draft form and was not used to evaluate this site. The proposal to cap the landfill was based on the data that was collected during the RI/FS and evaluated using the approved policies and guidelines of the remediation program. It is the goal of the program to develop remedial actions that best address the contamination found on site. The Draft Policy is under review based on public comment. Much public comment was received on the issue of cleanup to pre-release conditions where feasible. Since the Cleanup Policy is still in draft form, it cannot be applied to the remedial program for the Wallkill site. However, other program guidelines including the National Contingency Plan require the remedial program for the Wallkill site to be protective of public health and the environment.

C: Officials are playing down the danger posed by the site so as to minimize the cost of remediation and to protect real estate values and the proposed Orange County water loop.

R: One purpose for providing the data and other factual information concerning the site in the Record of Decision to the public is to show the basis on which decisions are being made. The RI/FS has been conducted in accordance with applicable State standards, guidance and criteria and to the best of our knowledge represents the conditions present at the site as they exist today.

Q: Why didn't the Town of Wallkill provide the DEC with all pertinent data regarding the on-site and off-site environmental conditions as required by the July 12, 1989 Order on Consent?

R: The Town provided DEC with a report entitled "Background Information Report Regarding Environmental Conditions at the Town of Wallkill

Landfill, August 1989." which was prepared by the Town. The report contains a summary of all persons responsible or potentially responsible for the disposal of hazardous waste at the site.

Q: Can the DEC subpoena the Town of Wallkill's records concerning the site?

R: Yes, if there is need. However, as noted above, information that was available concerning past activities at the site was presented to DEC by the Town of Wallkill. There is no need to subpoena these records.

C: No records exist for over a nine year period which would show the origin of the chemicals in the landfill and who was permitted to dump there. Records either did not exist or were destroyed because the Town of Wallkill knowingly allowed in-state and out-of-state dumpers to dispose of hazardous waste in the landfill.

R: Allegations of illegal activities are being investigated at this time.

It is important to note that during most of the time of operation (1965-1974), DEC did not exist and landfills were operated using regulations promulgated by DOH. The regulations at that time did not require records of dumping activities.

Q: Will anyone who is employed by the Town of Wallkill be in danger of losing their job if they provide information to the DEC concerning the site?

R: Absolutely not. The purpose of the investigation is to get as complete an understanding of the site as possible. Any information provided by town employees can only benefit the investigation of the site and aid in developing the best remedy to clean-up the site.

Issue 5: Given the information provided by local residents concerning site operations, it seems impossible that the testing that was performed at the site indicates minor contamination. The site should be tested again because eventually the contamination that is in the landfill will be detected.

Response: The RI/FS was a comprehensive study of the landfill. It is important to remember that the conditions of the landfill during the operation (some 20 years ago) are different from today. The information gathered during the RI/FS is representative of the conditions of the landfill as they exist now. Although local residents confirm that thousands of drums were disposed of in the landfill, testing of the site has not indicated that this disposal is currently causing a threat on-site or off-site that would require action beyond the proposed remedial plan. As previously stated should substances within the waste mass appear at monitoring points outside of the waste mass in exceedence of standards which pose a threat to human health or the environment, the Contingency Action Plan will be implemented.

* As noted earlier, additional testing of the landfill took place in May, 1992. The results of the investigation are not available at this time. The public will be kept informed when those results are finalized.

Q: Can the sediment in the two ponds north of Route 17K be sampled? A fish kill occurred in these ponds several years ago. Will these ponds be part of the remediation program?

R: Sediment was tested on-site and in the off-site marsh in several locations. The sediments in these two ponds were not sampled. These ponds are downstream of the off-site marsh that had been sampled and found not to be significantly contaminated. Because these ponds are in residential areas, and are a concern for the residents, DOH took samples of the surface water and sediments in the ponds north of Route 17K. Results of the sampling will be available soon.

Q: If nothing was found in wells at a certain depth, would it not be prudent to dig deeper wells to be sure there are no contaminants in the groundwater?

R: The Remedial Investigation Work Plan designed a groundwater study at different depths corresponding to the water table zone, soil/bedrock zone, and bedrock zone. Eight wells were installed at the water table surface. Seven wells were screened at the soil/bedrock interface and five wells were installed by coring into bedrock and collecting water from that zone. There was no need to drill beyond the well level established in the bedrock zone.

Q: How many monitoring wells were placed on the site and how was the location of the wells determined?

R: An array of 20 wells were placed throughout the site at specific depths to maximize the detection of migrating contamination. Wells were installed at the water table level to detect contaminants that would be supported on or above the water, that is, contaminants that are light and don't readily mix with water. Other wells were placed at the soil/bedrock interface to detect contamination above the less permeable rock unit. Wells were also cored into the bedrock to find contaminants that could have seeped into bedrock fractures.

The well locations were selected to investigate areas downgradient of potential contamination. During the second phase of the investigation, additional wells were sited to reach further from the landfill and increase the concentration of study in the downgradient groundwater flow path.

C: If the monitoring program finds contamination from degrading drums in five years, this level of testing will not be conducted then. Additional testing should be conducted now.

R: The purpose of the monitoring program is to provide an "early warning system" and alert the DEC and the Town to potential migration of contaminants. If the monitoring system detects contamination, additional measures will be taken, if necessary, to protect human health and the environment. However, based on public comment, additional testing was conducted at the landfill during May.

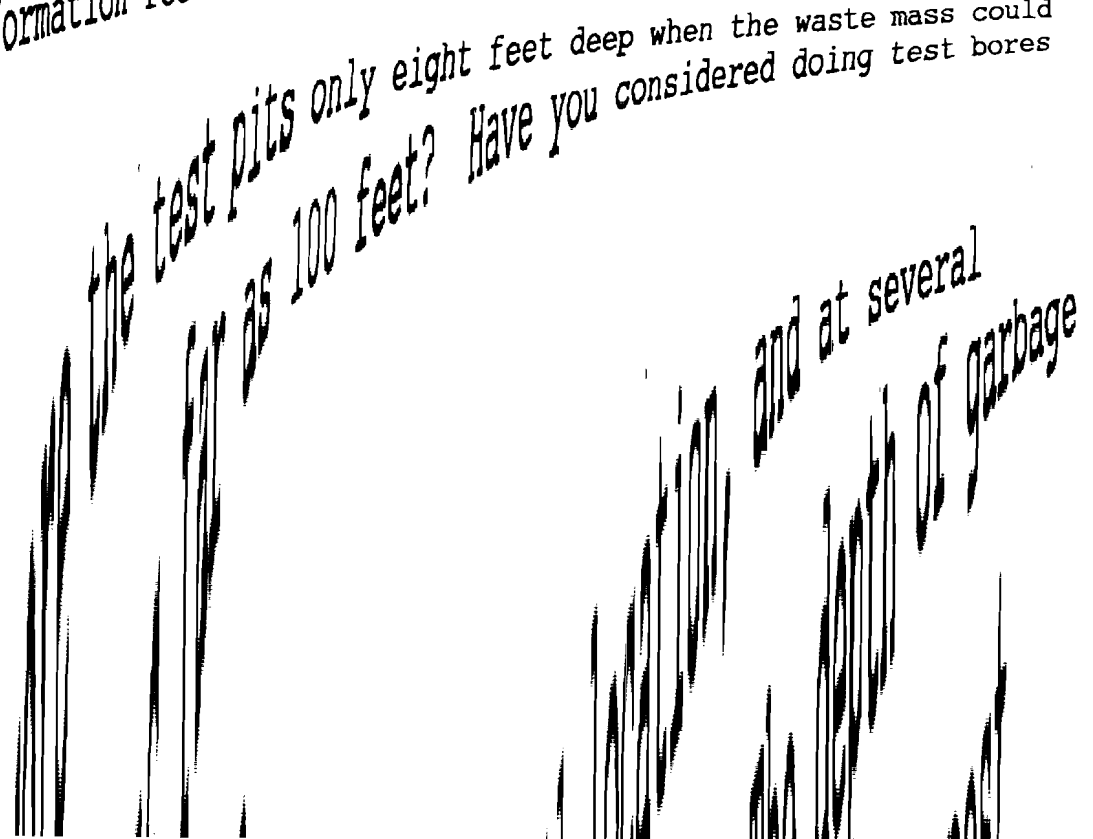
Q: Did you test for lead? If so, why isn't it included on the list of chemicals found at the landfill?

R: Yes, lead was tested for. However, the list being referred to does not indicate what was tested for at the landfill; the list indicates those compounds that were found to exceed standards. Lead was noted above State groundwater standards in one up-gradient well. The study also found that lead exceeded groundwater standards in an on site shallow monitoring well. Lead also was found below levels of concern in other samples taken on site.

Q: The landfill is 68 acres in size and only 73 test pits were excavated. Is one pit per acre enough to adequately investigate the site?

R: Test pit locations were determined using information from a geophysical survey program and previous investigations. The test pits were not excavated across the entire area of the site, rather they were located at the perimeter of the waste mass and in the actual waste mass (approximately 23 acres).

*Additional test pits were constructed in May 1992 using the new information received.



Waste Disposal Sites as a "Class 2" site which poses a significant threat to human health and/or the environment. Although the RI/FS indicated that the contamination outside of the waste mass at the site today is minor, the site must be remediated to ensure the protection of the environment and the long-term health of nearby residents.

Issue #6: The DEC and the Town of Wallkill seem to be lacking basic information about the site hydrology, including the destination of Tributary 20.

R: The data collected at the site includes a detailed geologic profile of the Wallkill Landfill Site and other hydrogeologic information. The hydrology of the Wallkill Landfill has been studied with a remediation objective in mind. The study looked at surface water flow and has pictured that information on a detailed topographic site map. The flow in Tributary 20 is downgradient from the southwest corner where it enters the landfill, to a point near the northeast corner of the landfill, where it exits the landfill property.

Subsurface water flow directions were determined by the hydraulic gradients between monitoring wells installed for the study. Three subsurface flow components were noted: first, a water table groundwater flow direction to the northeast; second, an overburden/bedrock interface groundwater flow direction to the north; and third, a bedrock flow direction to the northeast.

The velocity of groundwater flow beneath the landfill is
large differences in the permeabilities of five
sediment units. The sedimentary units
and clay greatly reduce the
water between

Q: Are you aware that the stream runs in two directions on the landfill?

R: Since the beginning of the RI/FS surface water flow in the tributary has been observed to be moving downhill and exiting the site to the Northeast. No flow was ever noted to the west, or southwest in the direction of the Goshen Turnpike. Water in the stream may have been rerouted or dammed by past landfilling operations but it is unlikely that such activities would have diverted water offsite to the Goshen Turnpike.

Wells have been drilled into the landfill to distinct depths to determine the direction of subsurface flow. From these wells hydraulic heads and groundwater flow directions have been ascertained. The direction of groundwater flow is predominately northward mimicking the flow direction of Tributary 20.

Miscellaneous Items

Q: How was the boundary of the landfill determined? Did the dashed lines on the site plan Figure 3-2 in the Feasibility Study show the footprint of regulated municipal waste with respect to waste that was buried.

R: In addition to construction of test pits and trenches, the boundary of the landfill waste mass was determined by a review of soil gas releases, geophysical studies, and well borings, as well as visual observations of ground disturbances by aerial photos and site reconnaissance on foot.

The boundary of the site is the town-owned property and includes all of the areas suspected of receiving wastes. The dashed lines on the figure show the limits of waste in contact with groundwater. The landfill was regulated by the Department of Health during its operation.

Q: Were there any autopsies performed on animals? An autopsy done on a pony housed one-quarter mile away from the site showed toxic chemicals in the pony.

R: No tissue analysis was performed as part of the remedial investigation.

* The results of the autopsy performed on the pony were forwarded to the technical staff. The results indicate that no organic chlorine pesticide-related compounds or PCBs were detected in the liver except for traces of two compounds. Cadmium was elevated in the liver and kidney. Lead and arsenic were near or below the limit of detection in both organs. The level of cadmium in the horse was not much above the average found in older horses in Sweden.

Q: When does the reimbursement program begin, where the State reimburses the Town of Wallkill up to 75 percent of the costs of the remedial program? Does the program start now or after the 30 year monitoring schedule is complete? If the cost of the remediation is recovered from a PRP, how is the money shared between DEC and the Town?

R: The reimbursement program has been in effect since the start of the remedial program and will continue through the end of construction. Operation and maintenance costs are not eligible for State reimbursement.

The Town and the State are joint partners in the remediation and both will attempt to recover the costs of the program from responsible parties. The money will be split 75/25 in the same manner as the reimbursement program.

Q: When discussing health risks from the site, DEC maintains the results of testing are below "acceptable standards" used by the State. Are these tolerance levels based on adult males?

R: Testing results are evaluated based on the most sensative population in the area, which most often is children, pregnant women, or the elderly. DOH is responsible for protecting the public from exposure to contamination that results from inactive hazardous waste sites in New York. DOH reviews all available information, including sampling results, to determine if any members of the local community are or could be exposed to contaminants from a site. Each of the human exposure pathways associated with inhalation, ingestion, and dermal absorption are evaluated. DOH's evaluation includes an assessment of the potential health effects for the most sensative community group that is potentially exposed. Site-specific cleanup levels are then determined on the basis of protecting the most sensative group that is potentially exposed to contaminants from the site.

Q: What happened to the money that Senator Schermerhorn gave to the Town of Wallkill to clean up the landfill?

R: The Town of Wallkill received $40,000 out of the Schermerhorn fund and that was used in the initial drum investigation and removal.

Q: Are DEC's findings a recommendation to the Town or can DEC decide on and execute this remedy independent of the Town?

R: DEC will make this decision independently from the Town.

Q: What is the recourse of a citizen to contradict DEC's findings? How can we stop an agency from doing something we find improper?

R: The citizen participation program at this site allows the public to voice their concerns and comments regarding the site and the proposed remedy. A proposal may be substantially changed based upon information presented by the public during the public meeting and the comment period. The material that is brought forth at this time will be reviewed and evaluated. If a final remedy is selected, a ROD is signed to document the rationale for this decision. If information affecting the remedy is made available following the signing of the ROD, the ROD may be reopened and appropriate changes made. Appeals to have the

decision change may be made to Commissioner Jorling in writing within 60 days of execution of the ROD.

Q: Is the dark, yellow-brown sludge in the basement of Glenda Kalodukas' Bloomingburg home coming from the Wallkill Landfill?

R: No. Mrs. Kaladukos' home is over two miles from the site. Other potential sources of this material in her basement are being investigated by the DOH.

Hydraulically there is no viable connection between the Wallkill Landfill in Orange County and Ms. Kaladukus' home in Bloomingburg, which is in Sullivan County.

C: A member of the public attempted for two weeks to get information from the Region 3 office concerning the status and classification of the site.

R: DEC is very concerned with providing prompt and accurate information to all questions concerning inactive hazardous waste sites. A Citizen Participation Specialist (CPS) works with the Division of Hazardous Waste Remediation to help ensure proper communication between DEC and the public. In addition, DEC has established a 1-800-342-9296 number for people to call with questions on inactive hazardous waste sites.

Typically, when a question is raised concerning an inactive hazardous waste site, the question is referred to the regional CPS. The CPS will discuss the site with the member of the public and attempt to address his or her concerns. At a minimum, the CPS will offer to send the person a copy of the two-page summary of the site as it is listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites.

One of the challenges of the citizen participation program is to clearly identify the CPS as the regional contact for public comments and questions. It can be difficult to find an answer to a question on an inactive hazardous waste site if that question is not referred to the correct contact within the region. It is very likely that this member of the public was not referred to the CPS or the staff of hazardous waste remediation. The DEC will increase its efforts to clearly identify the CPS as the regional contact for questions concerning inactive hazardous waste sites.

Q: Why didn't the Town make the Dames and Moore Report on Groundwater available to the consultant and the DEC? How much money was spent duplicating the work contained in this Report?

R: The "General Aquifer Characteristics" of the Wallkill Region were studied by Dames and Moore in a "Groundwater Availability Study for the Town of Wallkill" between 1980 and 1984. In the December 10, 1980 Report it states that in the Shawanguik Kill and Wallkill River Valleys, "In general, the limited thickness and areal extent of these

unconsolidated deposits would not appear to provide sufficient reservoir volume by themselves for a municipal water supply." After additional study a report was presented in September of 1982, it states, "although kame deposits and other permeable sequences appear to exist, there may be insufficient thickness to constitute a significant aquifer at all but Site 6B," which is adjacent to the Wallkill River and remote from the landfill site. The report further states "the subsurface character is complex and exhibits lateral changes over a relatively short distance." Though this regional trend is also evident beneath the Wallkill Landfill the money spent for the remedial investigation was necessary to determine the specific conditions at the Wallkill Landfill site.

R: The purpose of the monitoring program is to provide an "early warning system" and alert the DEC and the Town to potential migration of contaminants. If the monitoring system detects contamination, additional measures will be taken, if necessary, to protect human health and the environment. However, based on public comment, additional testing was conducted at the landfill during May.

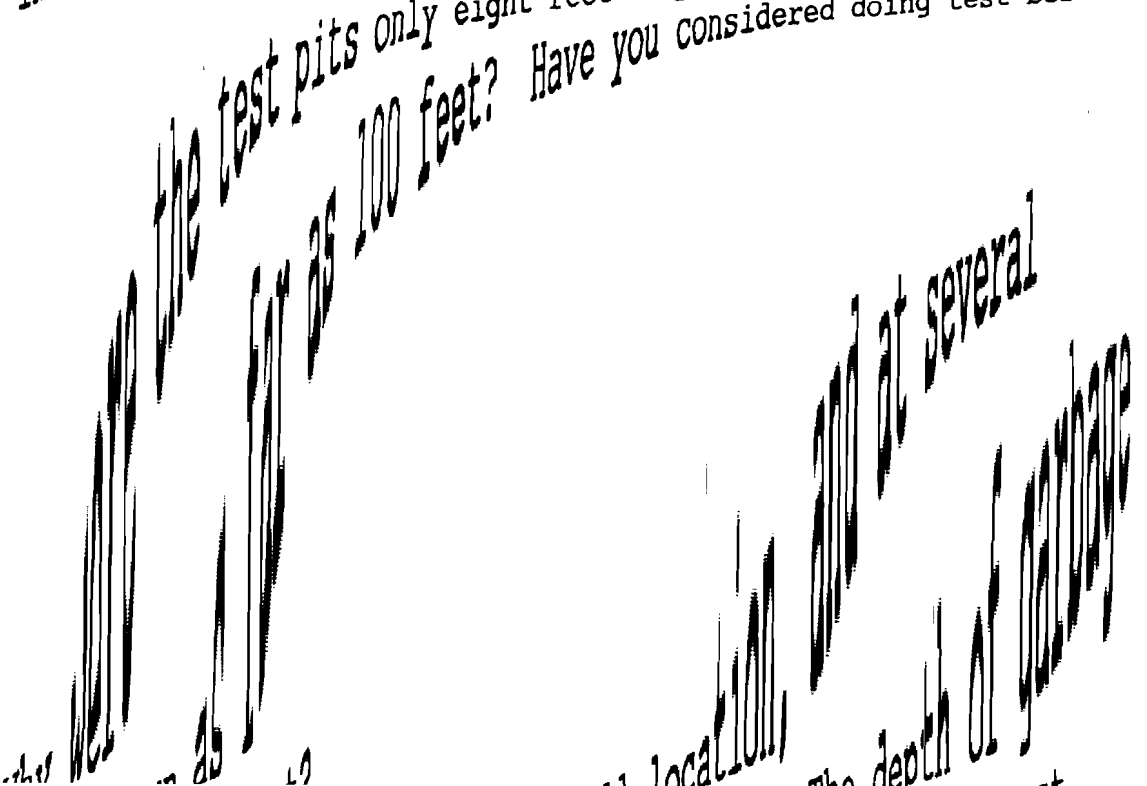
Q: Did you test for lead? If so, why isn't it included on the list of chemicals found at the landfill?

R: Yes, lead was tested for. However, the list being referred to does not indicate what was tested for at the landfill; the list indicates those compounds that were found to exceed standards. Lead was noted above State groundwater standards in one up-gradient well. The study also found that lead exceeded groundwater standards in an on site shallow monitoring well. Lead also was found below levels of concern in other samples taken on site.

Q: The landfill is 68 acres in size and only 73 test pits were excavated. Is one pit per acre enough to adequately investigate the site?

R: Test pit locations were determined using information from a geophysical survey program and previous investigations. The test pits were not excavated across the entire area of the site, rather they were located at the perimeter of the waste mass and in the actual waste mass (approximately 23 acres).

*Additional test pits were constructed in May 1992 using the new information received.



Waste Disposal Sites as a "Class 2" site which poses a significant threat to human health and/or the environment. Although the RI/FS indicated that the contamination outside of the waste mass at the site today is minor, the site must be remediated to ensure the protection of the environment and the long-term health of nearby residents.

Issue #6: The DEC and the Town of Wallkill seem to be lacking basic information about the site hydrology, including the destination of Tributary 20.

R: The data collected at the site includes a detailed geologic profile of the Wallkill Landfill Site and other hydrogeologic information. The hydrology of the Wallkill Landfill has been studied with a remediation objective in mind. The study looked at surface water flow and has pictured that information on a detailed topographic site map. The flow in Tributary 20 is downgradient from the southwest corner where it enters the landfill, to a point near the northeast corner of the landfill, where it exits the landfill property.

Subsurface water flow directions were determined by the hydraulic gradients between monitoring wells installed for the study. Three subsurface flow components were noted: first, a water table groundwater flow direction to the northeast; second, an overburden/bedrock interface groundwater flow direction to the north; and third, a bedrock flow direction to the northeast.

The velocity of groundwater flow beneath the landfill is highly variable due to large differences in the permeabilities of five distinct overburden sediment units. The sedimentary units with high percentages of silt and clay greatly reduce the flow velocity and reduce the flow of water between more permeable zones.

Q: Are DEC and the Town aware of the dump, under the [illegible] a lake a mile

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Q: Are DEC and the Town aware of the part of the Tributary that runs from the dump, under the highway and into Stone School House Road? There is a lake a mile long at this location where the Tributary is running. Have you looked at that and tested it for toxics? Have you tested the water of the Shawangunk Kill?

R: It was not considered necessary to test these locations because of their distance downstream from the site. The procedure that is used for testing a stream at a site is to start at locations on-site. If contamination is detected on-site then testing is conducted downstream. At the Wallkill Site testing was done on site, at a tributary No. 20 location upstream of near where it crosses the Goshen Turnpike to establish background conditions and in the wetlands downstream of the site.

*In May 1992 the DOH sampled surface water and sediments in the vicinity of Route 17k and in ponds locate downstream of were Tributary No. 20 crosses Route 17k. As previously stated the remedial plan provides for additional study if found to be warranted.

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*Additional test pits were constructed in May 1992 using the new information received.

Q: Why were the test pits only eight feet deep when the waste mass could extend down as far as 100 feet? Have you considered doing test bores down to 75-100 feet?

R: Test borings were conducted at each well location, and at several locations, the borings went through into bedrock. The depth of garbage in many areas was determined to be less then ten feet. The deepest point found during the investigation was approximately 20 feet.

Q: Was there testing done in the lagoon where the sludge and septic material was deposited?

R: To address concerns about the lagoons, a monitoring well was installed in the area thought to be most likely affected by the lagoon.

Q: If Senator Schermerhorn identified the landfill as a hazardous toxic waste site in 1984, how can it be a "minor" concern now? How can it be less toxic?

R: DEC agrees that the landfill is an inactive hazardous waste site. The landfill is listed on the New York State Registry of Inactive Hazardous