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ISLIP RESOURCE RECOVERY AGENCY

REMEDIAL INVESTIGATION / FEASIBILITY STUDY

REMEDIAL INVESTIGATION REPORT

SONIA ROAD LANDFILL
WEST BRENTWOOD, NEW YORK
SITE REGISTRY NO. 152013

Remediation

Dvirka and Bartilucci
Consulting Engineers

APRIL 1998

REMEDIAL INVESTIGATION REPORT
SONIA ROAD LANDFILL
WEST BRENTWOOD, NEW YORK

(SITE REGISTRY No. 152013)

PREPARED FOR

ISLIP RESOURCE RECOVERY AGENCY

BY

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APRIL 1998

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION REPORT

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S.0 EXECUTIVE SUMMARY

Introduction

As part of the New York State's Superfund Program to investigate and remediate hazardous waste sites, the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent with the Town of Islip (Town) to conduct a remedial investigation and feasibility study (RI/FS) at the Sonia Road Landfill located in West Brentwood, Suffolk County, New York.

The Sonia Road Landfill, which is owned by the Town, is a 42-acre inactive municipal solid waste landfill which received municipal solid waste from 1965 until 1974. According to the NYSDEC, in addition to municipal solid waste, the landfill allegedly received 400 cubic yards of hazardous materials from Hooker Chemical Corporation in 1973 and 1974. As a result, the landfill was listed as a Class 2 site in the NYSDEC registry of inactive hazardous waste sites (Site No. 152103), which is defined by the State as posing a significant threat to the public or environment. However, a review of NYSDEC records as part of the RI/FS did not reveal the source of this allegation. There have also been unconfirmed allegations that solvents and plating sludges may have been received at the landfill.

Following cessation of solid waste disposal, the eastern portion of the landfill was converted into recreational sports fields and the western portion was to be developed as an industrial subdivision. The sports fields have since been closed due to differential settling of waste and some refuse, in particular tires, rising to the surface, and the western portion was never developed. Currently, the site is vacant and is zoned for industrial use. In the future, the Town plans to utilize the site for industrial purposes, with outdoor activities and storage permitted.

The purpose of the RI/FS for the Sonia Road Landfill in the following:

- Determine the nature, extent and source(s) of contamination;
- Define the limits of waste disposal;

- Determine the risk to human health and the environment;
- Prepare a Presumptive Remedy Engineering Design Report for a final cover;
- Prepare a feasibility study to identify and evaluate additional remedial alternatives, if required; and
- Recommend a cost-effective, environmentally sound, long-term remediation plan.

In addition to the investigation of the Sonia Road Landfill, the purpose of the remedial investigation is to characterize groundwater quality in the study area and identify other sources of contamination in the vicinity of the landfill. The identification of other sources of contamination will allow for a more comprehensive understanding of the potential threat to human health and the environment created by the Sonia Road Landfill independent of other contributing sites in the area of concern.

This document, entitled "Remedial Investigation Report for the Sonia Road Landfill," presents a detailed description of the activities and results of a remedial investigation field program conducted in accordance with the Federal Comprehensive Emergency Response, Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA), and the NYSDEC Superfund Program, including NYSDEC Technical and Administrative Guidance Memoranda, "Guidelines for Remedial Investigation/Feasibility Studies."

The remedial investigation field program for the Sonia Road Landfill comprised the following activities:

- Site grid network survey;
- Soil vapor/explosive gas survey and sampling;
- Surface soil sampling;
- Test pit and test trench construction;
- On-site soil borings and subsurface soil sampling;

- Hydropunch/groundwater screening and sampling;
- Monitoring well installation and sampling;
- Groundwater level measurement;
- Wildlife habitat survey;
- Air monitoring; and
- Surveying.

In addition to the field activities, a survey was performed to determine areas provided with public water supply; locations of public water supply and commercial/industrial wells; and properties that are not provided with public water and may obtain water from private well that could possibly be impacted by the landfill. Also, a review was conducted to identify other sources of groundwater contamination in the study, in particular in the industrial areas upgradient (north and northwest) of the landfill.

The following is a summary of the findings, conclusions and recommendations resulting from the remedial investigation as a function of the media investigated.

Findings and Conclusions

Soil Vapor/Explosive Gas

Soil vapor screening for total organic vapors and the analytical results of the soil vapor samples did not indicate elevated levels of volatile organic compounds (VOCs). Therefore, the release of VOCs from the landfill into ambient air is not a concern at the Sonia Road Landfill. However, based on methane measurements obtained during this investigation and previous monitoring results, the potential for off-site migration of methane gas exists and the potential is expected to become greater after implementation of the selected Presumptive Remedy for the landfill, which is placement of a low permeability geomembrane over the landfill site. As a result, soil vapor/methane gas is a medium of concern.

Surface Soil

The concentrations of contaminants detected in surface soil, exclusive of iron and zinc found in a limited area of stressed vegetation in the central portion of the landfill, are not significant and are consistent with background levels. Although the surface soil in the area of stressed vegetation could possibly be considered a medium of concern if there was frequent and long-term exposure to this soil, which does not appear to have occurred in the past, the Presumptive Remedy (capping) selected for the site will mitigate future potential migration of and contact with this soil. Therefore, surface soil is not a medium of concern relative to past, present and planned use of the site.

Waste and Subsurface Soil

Elevated concentrations of contaminants, typical of municipal solid waste, were detected in samples collected from waste buried in the landfill. However, significant levels of VOCs were not detected in the waste samples, and only low levels of contaminants were detected in soil immediately below the waste material. Although waste could be considered a medium of concern, the landfill is currently provided with a soil cover which mitigates the potential for contact with the buried material. In addition, the landfill is planned to be capped, which will further reduce concern relative to potential direct contact with the waste material and will mitigate leaching of contaminants to groundwater.

Groundwater

Samples of shallow groundwater collected immediately downgradient of the landfill indicated the presence of elevated concentrations of leachate parameters. However, no VOCs were detected, except for low levels of chloroethane (less than 10 ug/l). The presence of leachate parameters extends downgradient from the landfill and into deeper groundwater in the Upper Glacial aquifer. However, it appears that leachate impacts on groundwater are being naturally

attenuated at the landfill site based on the finding of lower levels of leachate parameters in groundwater immediately contiguous to the site as compared to downgradient. This attenuation is likely attributable to the aging of waste material in the landfill which last received waste nearly 25 years ago.

Although the presence of leachate parameters in groundwater could be considered a medium of concern, this groundwater is not expected to impact human health as a result of 1) all properties (except possibly for one abandoned house) supplied with public water within 1.5 miles downgradient of the landfill; 2) the landfill site and downgradient areas being underlain by the Gardiners Clay, which is a low permeability barrier to prevent migration of contaminants; 3) the distance of the closest public water supply wells being over 2 miles downgradient of the landfill; and 4) the depth of the public water supply wells downgradient of the landfill being greater than 400 feet. Based upon the above-referenced factors, there is little concern for this medium. In addition, implementation of the selected Presumptive Remedy (capping) for the Sonia Road Landfill will significantly mitigate the generation of leachate in the future and further lessen this concern.

With regard to samples of deep groundwater collected in the vicinity of the Sonia Road Landfill, significant levels of volatile organic compounds were detected in a few deep monitoring wells immediately downgradient of the landfill; however, elevated levels were also detected upgradient of the landfill, including deep monitoring immediately upgradient of the landfill. There are a number of potential sources of VOC contamination upgradient of the Sonia Road Landfill, in particular the Baron Blakeslee site which is a documented significant source of the same contaminants detected in groundwater at the landfill. A plume of highly contaminated groundwater has previously been determined as migrating from the Baron Blakeslee site and potentially beneath the northeast corner of the landfill where the highest VOC concentrations were detected during this investigation. In addition, the finding of VOC contamination in the deep upgradient well on the western boundary of the landfill indicates other sources of groundwater contamination in the industrial area northwest of the landfill.

Based on documented sources of contamination upgradient of the landfill, and the finding of significant VOC contamination only in the deep wells at the landfill site and the lack of correlation of leachate parameters with the VOCs detected in the deep wells, it is unlikely that the Sonia Road Landfill is the cause of volatile organic chemical contamination. Therefore, although deep VOC-contaminated groundwater is a medium of concern in the study area, since it does not appear to be related to the landfill, it is not a medium of concern relative to the Sonia Road Landfill.

Recommendations

Based on the findings and conclusions of the remedial investigation, the following is recommended for the Sonia Road Landfill and study area.

- Implement the selected Presumptive Remedy which will provide for a low permeability cap over the landfill. The cap will mitigate the generation of landfill leachate and impacts on groundwater. In addition, the cap will also provide closure of the waste mass and underlying soils;

- As a result of the landfill capping, provide for landfill perimeter gas control to prevent off-site subsurface migration of methane;

- Since the Presumptive Remedy will mitigate future impacts to groundwater resulting from leachate generation, remediation of groundwater, relative to the Sonia Road Landfill, is not recommended;

- Provide for long-term landfill gas and groundwater monitoring to evaluate the effectiveness of the Presumptive Remedy and landfill gas control; and

- Relative to groundwater contaminated by volatile organic compounds in the Sonia Road Landfill study area, it is recommended that the New York State Department of Environmental Conservation determine and remediate the source or sources of this contamination.

The above are preliminary recommendations based on comparison to standards, criteria and guidelines selected for the Sonia Road Landfill and may be modified based on the results of the Qualitative Risk Assessment.

1.0 INTRODUCTION

1.1 Project Objective

As part of the State of New York's Superfund Program to investigate and remediate hazardous waste sites, the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent with the Town of Islip (the Town) to conduct a remedial investigation and feasibility study (RI/FS) at the Sonia Road Landfill located in West Brentwood, Suffolk County, New York. The Sonia Road Landfill is presently listed as a Class 2 site on the NYSDEC registry of inactive hazardous waste sites (Site No. 152103). A Class 2 site is defined by the State as posing a significant threat to the public or environment.

The purpose of this RI/FS is the following:

- Determine the nature, extent and source(s) of contamination;
- Define the limits of waste disposal;
- Determine the risk to human health and the environment;
- Prepare a Presumptive Remedy Engineering Design Report for a final cover;
- Prepare a feasibility study to identify and evaluate additional remedial alternatives, if required; and
- Recommend a cost-effective, environmentally sound, long-term remediation plan.

Although the focus of the investigation is the Sonia Road Landfill, the purpose of the remedial investigation is to also obtain information with regard to groundwater quality upgradient and downgradient of the site in order to characterize groundwater quality in the study area and identify other sources of contamination in the vicinity of the landfill. The identification of other sources of contamination will allow for a more comprehensive understanding of the potential threat to human health and the environment created by all contributing sites.

This study has been conducted in accordance with the federal Comprehensive Emergency Response Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA) and the NYSDEC Superfund Program, including NYSDEC Technical and Administrative Guidance Memoranda: "Guidelines for Remedial Investigation/ Feasibility Studies," "Selection of Remedial Actions at Inactive Hazardous Waste Sites" and "Accelerated Remedial Actions at Class 2, Non-RCRA Regulated Landfills."

Other documents prepared as part of the RI/FS, including the Baseline Risk Assessment, Feasibility Study and Presumptive Remedy Engineering Design Report, are presented as separate reports.

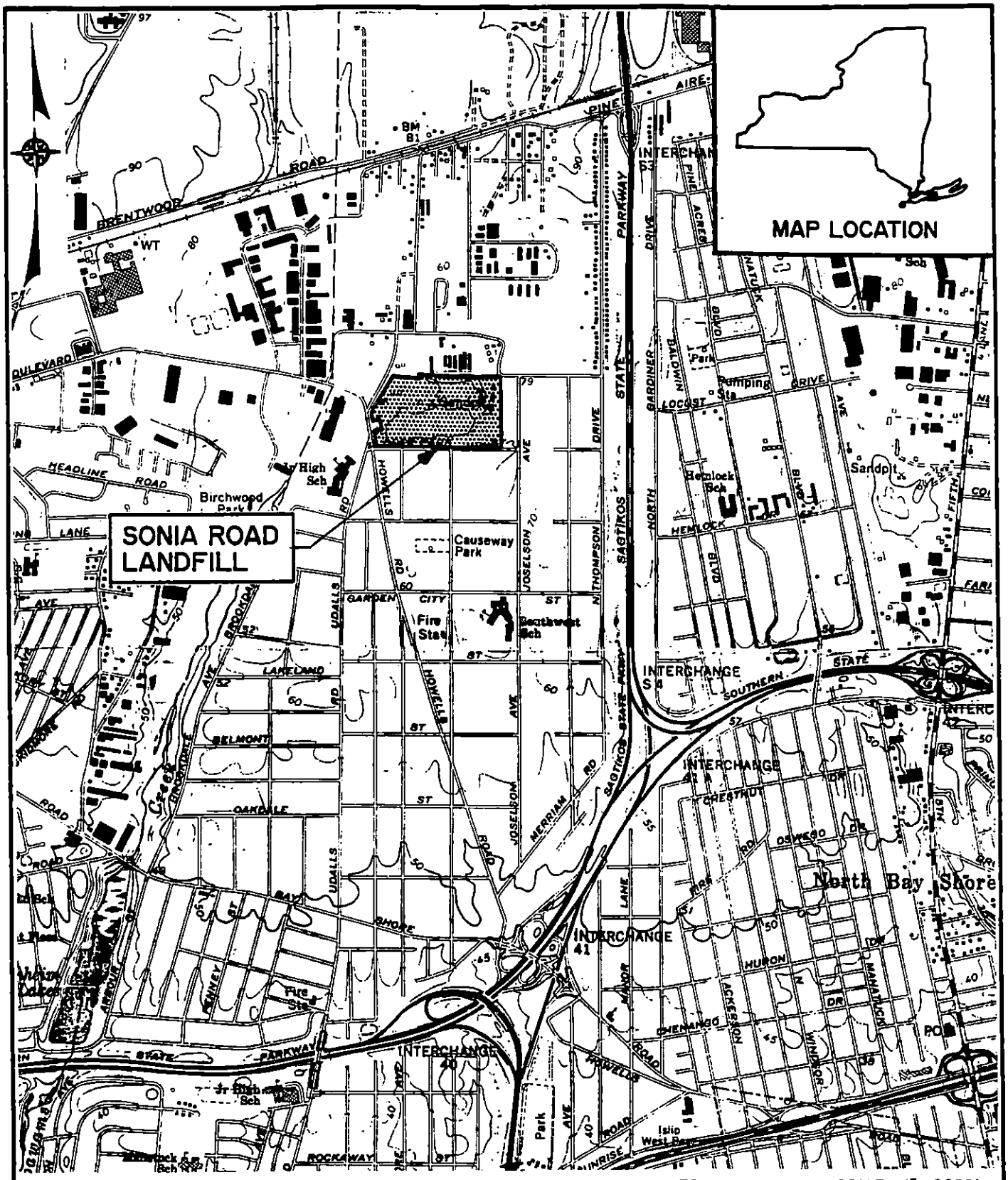
1.2 Site Location, Ownership and Access

The Sonia Road Landfill is an inactive municipal solid waste landfill located in West Brentwood in the Town of Islip, Suffolk County, New York (see Figure 1-1). The site is bordered on the south by Deer Park Street, on the west by Corbin Avenue, on the north by industrial properties and on the east by residential properties.

The site is owned by the Town of Islip and is currently vacant. The entire landfill is fenced and main access is through a gate along Corbin Avenue. Another access gate is located along Deer Park Street toward the southeast corner of the site.

1.3 Site Description

The Sonia Road Landfill is generally rectangular in shape and comprises approximately 42 acres. The landfill is divided into two sections by an earthern berm which runs north and south through the approximate center of the site (see Figure 1-2). The eastern section comprises approximately 19 acres, and the western section comprises about 23 acres.



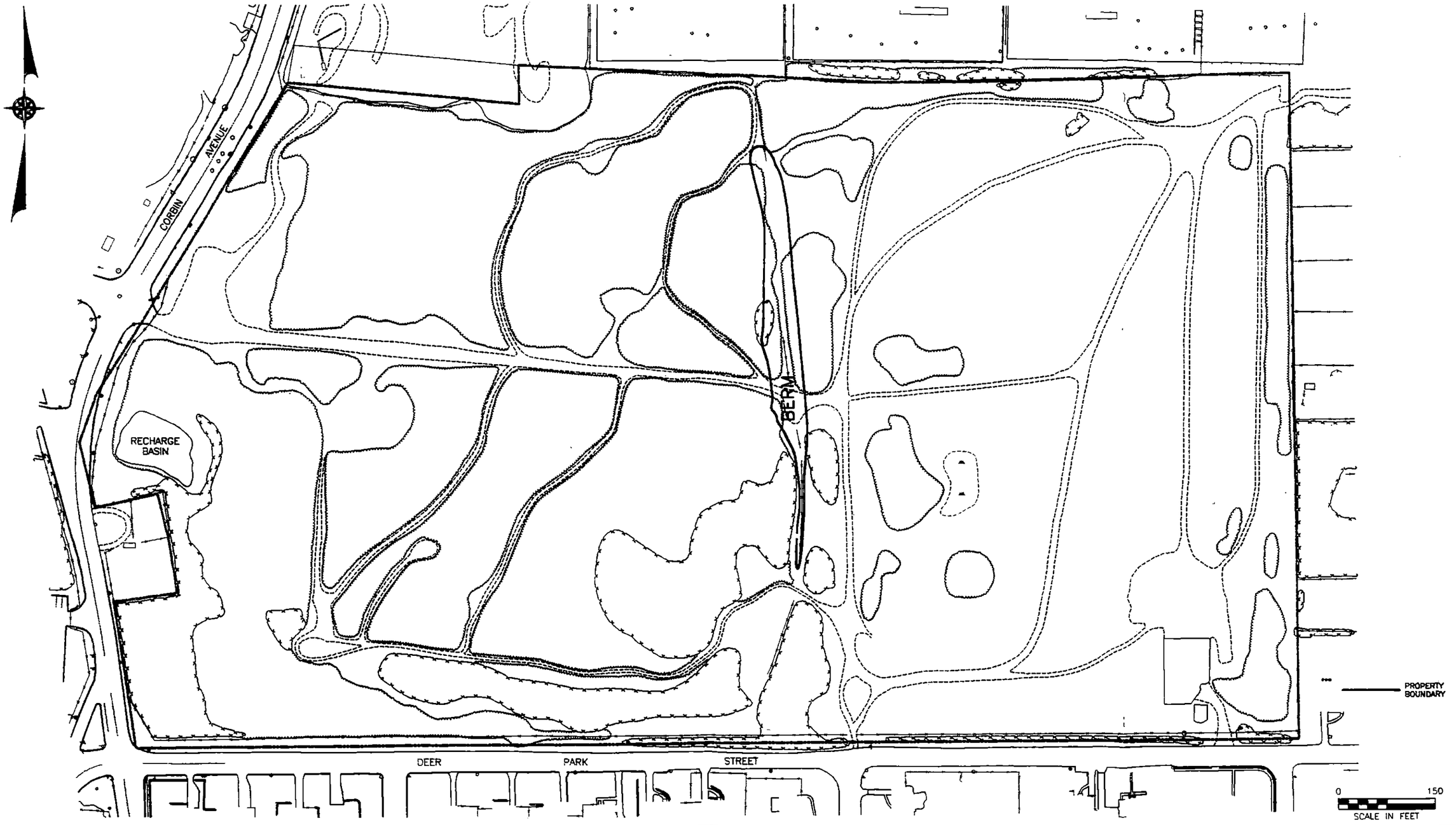
SOURCE: U.S.G.S. GREENLAWN, N.Y. AND BAY SHORE WEST, N.Y. QUADRANGLES SCALE: 1"=2000'

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1-1



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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SITE PLAN

Dvirka and Bartilucci
Consulting Engineers
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FIGURE 1-2

Subsequent to the cessation of waste disposal, the eastern section was converted into sport fields; however, these fields have since been closed due to differential settling of waste and some refuse, in particular tires, rising to the surface. An east-west roadbed was constructed of crushed stone in the western section of the landfill to allow this section to be subdivided and sold after it was rezoned for industrial use; however, the western section was never developed.

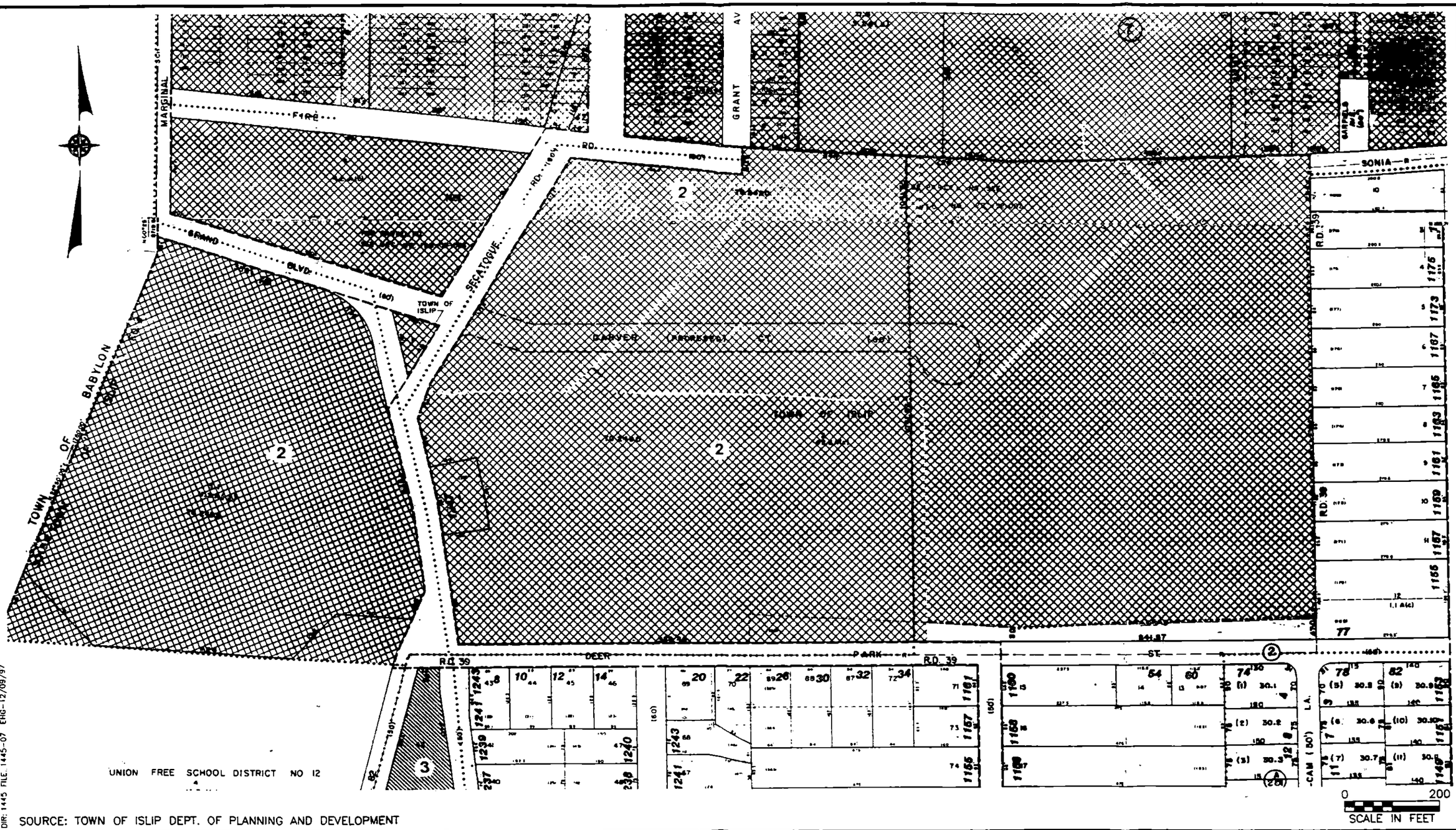
Several dirt paths exist throughout the landfill. Tall weeds, fragmites and young trees cover most portions of the western section of the site, with more mature trees lining the southern border of the site. The flatter grade and less sparse eastern section of the site contains lower vegetative growth and young trees.

1.3.1 Land Use

Based on the Town of Islip - Amended Zoning Map (Sections #198 and 221) (see Figure 1-3), as described above, the western section of the Sonia Road Landfill is currently zoned industrial use with outdoor activity and storage permitted (Zone I2), and the eastern section of the landfill is currently zoned for manufacture and wholesaling (limited to indoor activity), and designated as Zone I1, except for a small area located in the southeastern portion of the landfill property which is zoned residential. Previously, the eastern section was used for a sportsfield. The entire site is presently vacant.

With regard to future use, the Town is planning to lease a portion of the western section of the site for construction of a tower for cellular communications. The Town desires to rezone the eastern section to I2 and return this area to industrial usage.

The landfill is bordered to the north and west by industrial areas, and to the east and south by residential areas. One residential property is located adjacent to the site on Corbin Avenue and the landfill surrounds this property on the northern, eastern and southern sides (see Figure 1-2). Immediately to the southwest of the site along Udalls Road is the Brentwood West Middle School.



DIR: 1445 FILE: 1445-07 EHG-12/09/97

SOURCE: TOWN OF ISLIP DEPT. OF PLANNING AND DEVELOPMENT

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

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ZONING MAP OF SITE

FIGURE 1-3

1.3.2 Climate

The climate of the Sonia Road Landfill study area (Long Island) is considered temperate. Air masses and weather systems mostly originate in the humid continental climate of North America and are tempered by the maritime influences within the region. As a result of these influences, daily and annual temperatures have a reduced range. Precipitation is fairly uniform, but generally heavier in the winter and spring.

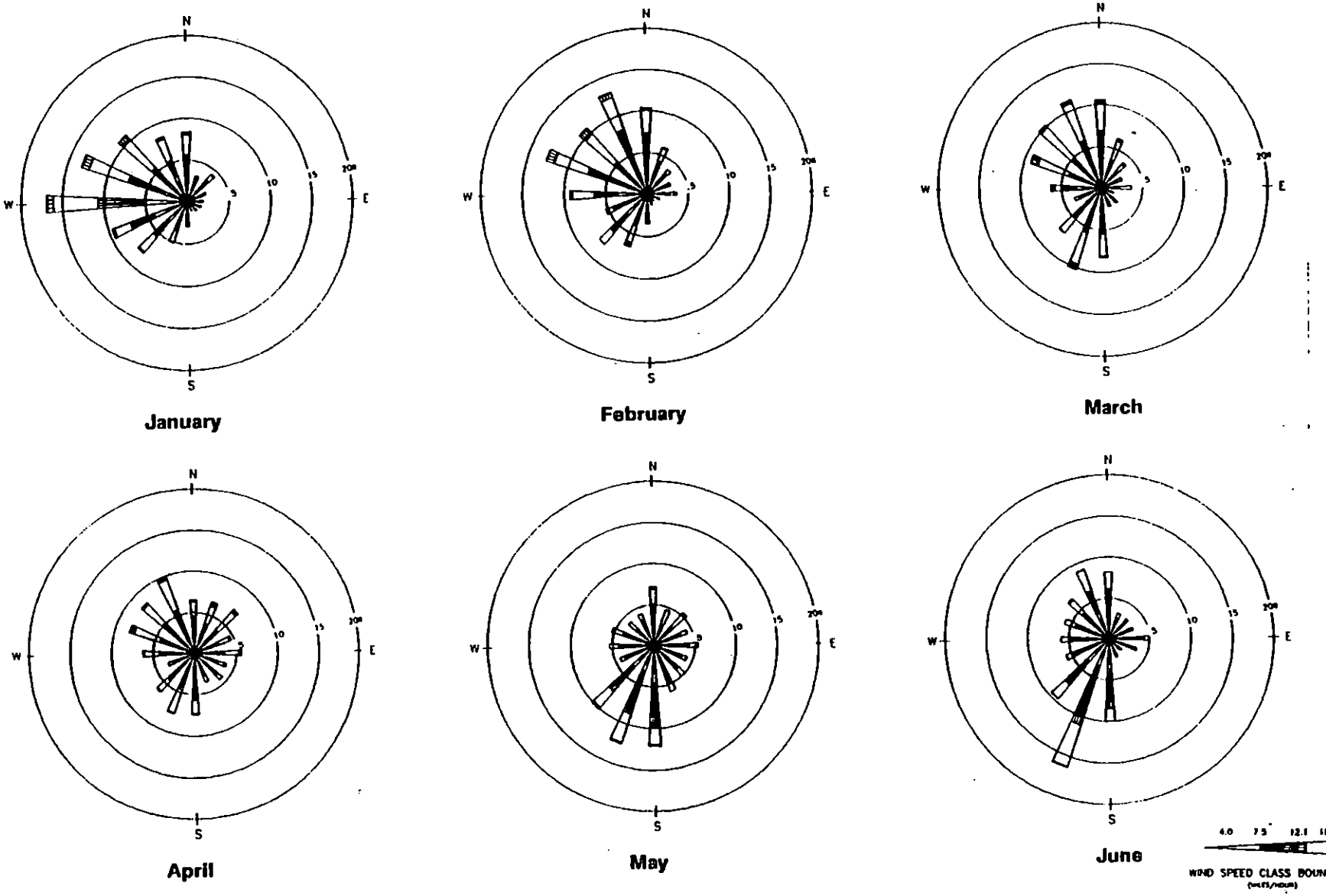
Monthly precipitation data for the 30-year period between 1961 and 1990 were collected at Islip MacArthur Airport. This data is compiled by the National Climatic Data Center (NCDC). According to NCDC, the average annual precipitation for Islip MacArthur Airport was 46.07 inches for the 30-year period. The weather station at Islip MacArthur Airport is located approximately 9 miles to the east of the Sonia Road Landfill.

The normal daily mean temperature for the 30-year period from 1961 to 1990 was reported at 51.3°F. The normal daily minimum temperature for this 30-year period was reported at 43.4°F. The normal daily maximum temperature for this 30-year period was reported at 53.9°F.

The prevailing wind is direction from the west-northwest. The strength of the wind generally increases in the winter and decreases in the summer. Significant gusts occur during winter; however, significant gusts related to thunderstorms or squall lines also occur in the summer. Wind speeds and direction by month for the five-year period from 1985 through 1989 from Islip MacArthur Airport are presented by the windrose diagrams shown in Figure 1-4.

1.3.3 Topography

The Sonia Road Landfill study area is situated on a south-sloping glacial outwash plain approximately four miles south of the Ronkonkoma Moraine. The landfill is located in the upper portion of a south-southwest trending valley in which Sampawams Creek flows. The head waters



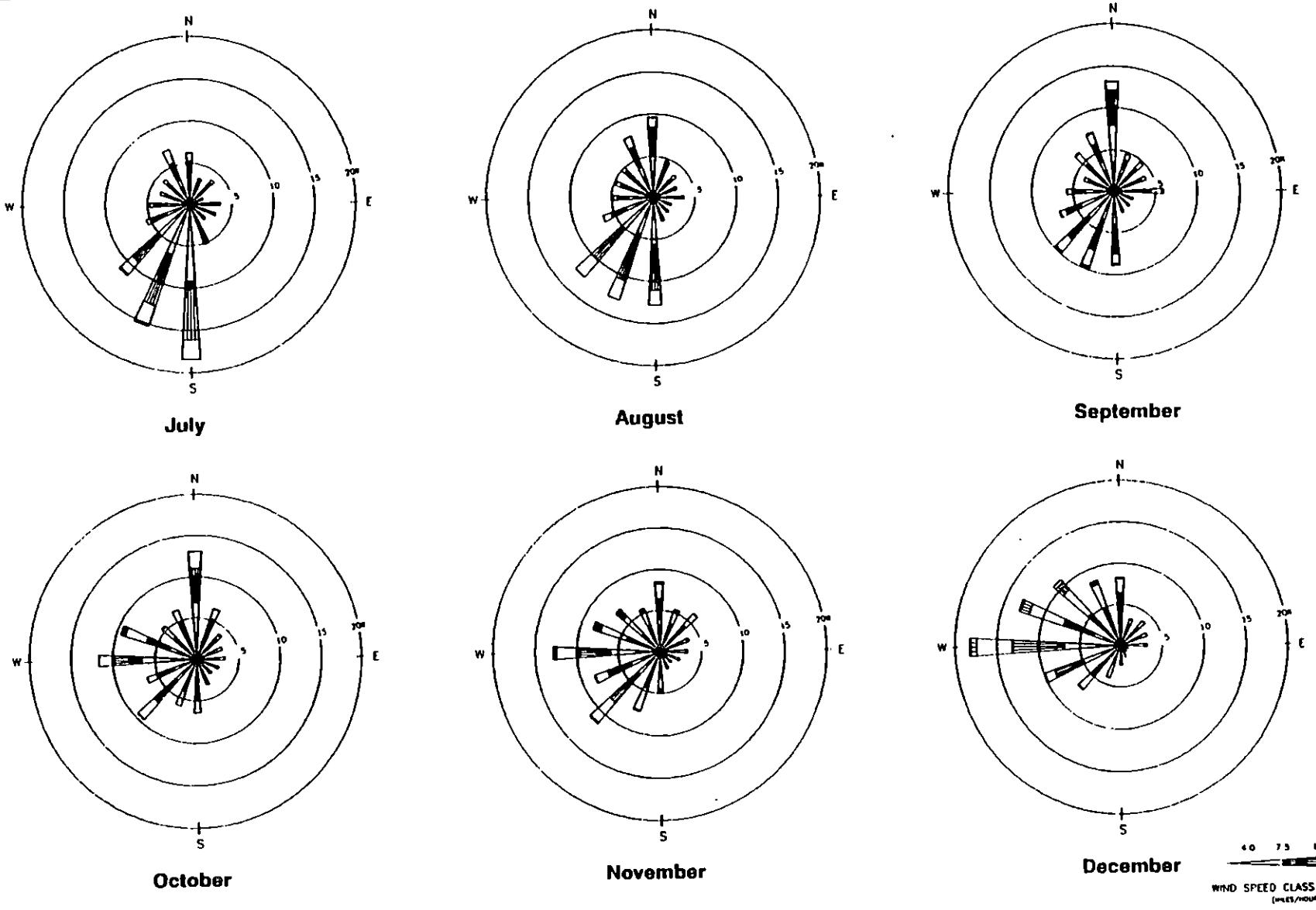
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SONIA ROAD LANDFILL
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ISLIP MacARTHUR AIRPORT
5 YEAR WIND ROSE BY MONTH
1985 THROUGH 1989

FIGURE 1-4

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DIR: 1445 FILE: 1445-10 EHG-12/09/97

SONIA ROAD LANDFILL
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ISLIP MacARTHUR AIRPORT
5 YEAR WIND ROSE BY MONTH
1985 THROUGH 1989

FIGURE 1-4 (Cont.)

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of the creek lie approximately 3,000 feet southwest of the site, however, the dry creek channel extends north to within approximately 800 feet southwest of the landfill (Sorenson, 1979). The land surrounding the site slopes gently to the south-southwest except in the area of the Sampawams Creek where land generally slopes toward the creek (see Figure 1-1). Elevations in the vicinity of the landfill (within about 1000 feet) range from approximately 50 feet above mean sea level (AMSL) at the head of the Sampawams dry creek channel to approximately 85 feet AMSL to the north-northeast of the site, although a few isolated bermed areas on the landfill are over 90 feet AMSL.

The surface of the eastern section of the landfill slopes gently toward the interior of the landfill (except for the surrounding berms) where several shallow depressions are located. The land slopes more steeply on the western section of the landfill towards the west and Corbin Avenue. The topography of the western section of the landfill is also more variable with the greatest relief ranging from approximately 50 feet AMSL at the lowland basin area to almost 90 feet AMSL only 400 feet to the southeast at a bermed area. Topographic features of the site are illustrated in Figure 3-1.

1.3.4 Soils

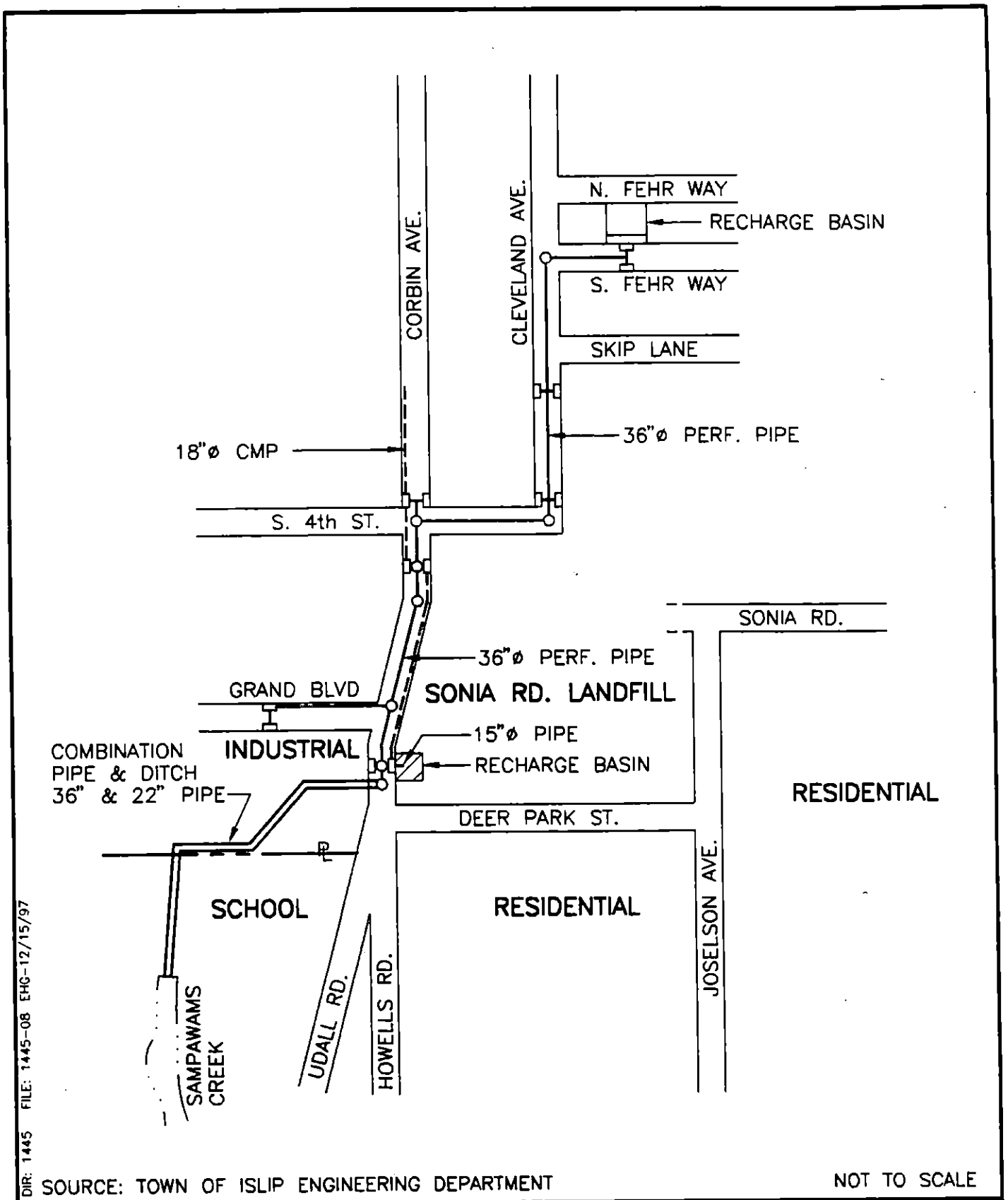
Soils in the Sonia Road Landfill study area are predominantly glacial outwash consisting of highly permeable sands with some areas of locally gravelly sands. According to the Soil Survey of Suffolk County, New York, prepared by the United States Soil Conservation Service, the predominant soil type designated for the area surrounding the landfill is the Haven loam (with 0-2% slopes). The Riverhead and Haven soils (with 0-8% slopes) are also found to the southeast and southwest of the site. Also according to the Soil Survey of Suffolk County, the actual soil types designated for the Sonia Road Landfill are Gp (Gravel Pits) for the northern half of the landfill and Ma (Made Land) for the southern half of the landfill. These classifications were obviously made after the native cover soils at the site were removed and/or reworked.

1.3.5 Storm Water/Surface Drainage

In the eastern portion of the Sonia Road Landfill, the surface slopes gently towards the shallow interior depressions. During periods of heavy precipitation, water moves into these shallow depressions where ponding occurs. The surface of the western side of the landfill slopes steeper towards the west and Corbin Avenue. During periods of heavy precipitation, water moves into shallow depressions and also into the recharge basin of lowest elevation (approximately 50 feet AMSL) located in the western portion of the site. According to the Town of Islip, this recharge basin was constructed by the Town in the late 1960s/early 1970s for draining the intermittent flooding occurring at the intersection of Grand Boulevard and Corbin Avenue.

As described previously in Section 1.3.3, the Sonia Road Landfill is located in the upper portion of a south-southwest trending valley in which Sampawams Creek is located. The northern end of this creek is located approximately 800 feet to the southwest of the site. The northern extent of this creek consisted of a dry channel bed prior to the recent addition of a storm water drainage system in the study area described below. Streamflow in the creek is principally groundwater outflow since its streambed elevation is lower than the water table. The average discharge of the Sampawams Creek measured during the Flow Augmentation Needs Study (FANS) (from 1945 to present) is 9.8 cubic feet per second (cfs) (Camp Dresser and McKee, 1997). The slope of the land between the west portion of the landfill and the northern extent of the Sampawams Creek is negligible.

According to the Town, the storm water drainage system for the residential areas to the east and south of the Sonia Road Landfill consists of independent leaching pools. In 1993, a storm water drainage system was installed north and west of the landfill primarily to alleviate high groundwater in the industrial area north of the landfill. The drainage/groundwater management system consists of 36-inch diameter perforated pipe (similar to a French-drain) to mitigate the groundwater table from rising above the piping and causing flooding during periods of heavy precipitation. This drainage system, as shown in Figure 1-5, originates near a recharge basin north of the landfill on South Fehr Way, continues south along Cleveland Avenue, west



SONIA ROAD LANDFILL
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STORMWATER DRAINAGE SYSTEM DIAGRAM IN VICINITY OF SITE

FIGURE 1-5

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along South 4th Street, south along Corbin Avenue, crosses west over an industrial property north of the Brentwood West Middle School and eventually discharges to the northern extent of the Sampawams Creek.

The drainage system also connects to and drains individual catch basins which are connected to leaching pool systems, with as many as 8 leaching pools per catch basin. According to the Town, the recharge basin located on the Sonia Road Landfill, although not directly connected to the drainage system, is connected to the same catch basins and functions as a backup to receive overflow from the drainage system. The recharge basin also functions as a separate system. The Town does not have information regarding the current condition of the pipe from the drainage system into the recharge basin. This basin does not have a spillway and the pipe may be buried. A regional map depicting the entire drainage system in the study area is not available. Industrial and commercial facilities are required by the Town to have individual leaching pools for storm water drainage.

1.3.6 Flood Plains

The Flood Insurance Rate Map No. 365337 0005C includes the Sonia Road Landfill in Zone C which is designated as an area of minimal flooding. A narrow area surrounding Sampawams Creek lies in Zone A which is designated as an area of a 100-year flood.

1.3.7 Surface Water

As previously discussed, the closest surface water is the headwater of Sampawams Creek located approximately 3,000 feet to the southwest of the landfill, however, due to the recent installation of a storm water drainage system, intermittent discharges may vary the extent of the headwater of this creek. A recharge basin located in the southwestern area of the Sonia Road Landfill is generally ponded. During heavy precipitation (typically during the winter and spring), ponding occurs in several depressions on the eastern side of the landfill. The next closest surface water to the landfill is Belmont Lake and Elda Lake located approximately three miles to the

southwest. Other than these two lakes and several associated creeks, including the Carls River and Lawrence Creek, the next closest surface water is the Great South Bay which is located approximately 4-1/2 miles to the south of the site.

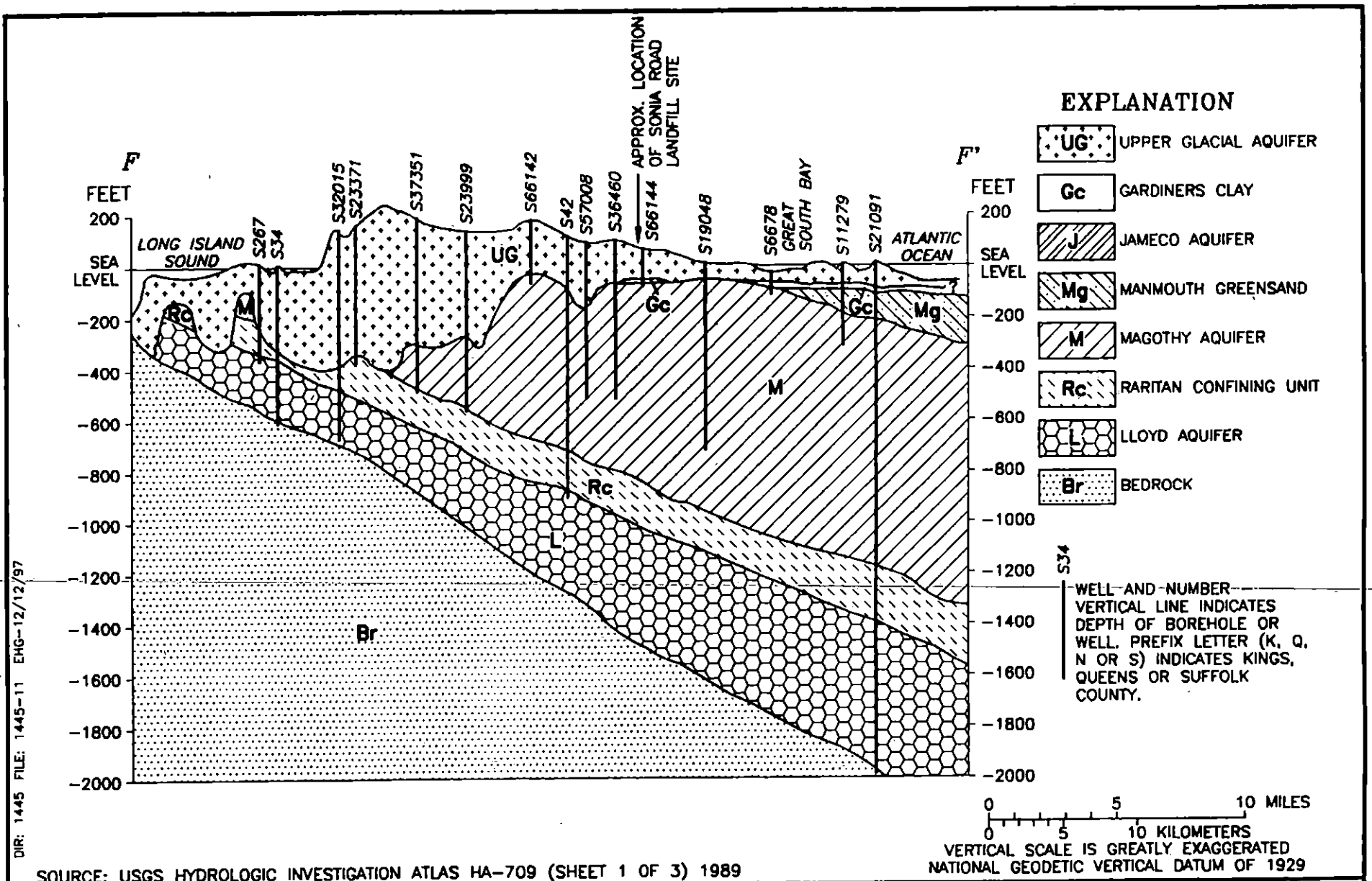
1.3.8 Regional Geology

Long Island is composed of a thick succession of unconsolidated sediments of Upper Cretaceous and Pleistocene age which forms Long Island's principal aquifers and confining units. These unconsolidated sediments overlie a southeasterly sloping crystalline bedrock basement of Precambrian age. The geologic history of this region exceeds 575 million years. However, long periods of nondeposition and/or periods of large-scale erosion are responsible for limiting the rock record to the older Precambrian bedrock and younger overlying Upper Cretaceous and Pleistocene sands, gravels and clays which are thought to have been deposited during the last 125 million years.

The geologic formations associated with the Sonia Road Landfill study area, from shallow to deep are: (1) the Upper Glacial aquifer; (2) the Gardiners Clay confining unit; (3) the Magothy aquifer; (4) the Raritan Clay confining unit; (5) the Lloyd aquifer; and (6) bedrock. A generalized north-south geologic cross section depicting the stratigraphy of the study area is illustrated in Figure 1-6. For the purpose of this remedial investigation of the Sonia Road Landfill, only the Upper Glacial aquifer, the Gardiners Clay unit and the Magothy aquifer will be discussed, since these units comprise the stratigraphy of interest for this study.

1.3.9 Regional Hydrogeology

The two major water-bearing units in the region of the Sonia Road Landfill are the Upper Glacial and the Magothy aquifers. The Magothy aquifer has been reported to be confined in areas where the Gardiners Clay unit is present and semi-confined where this clay unit is non-continuous.



SOURCE: USGS HYDROLOGIC INVESTIGATION ATLAS HA-709 (SHEET 1 OF 3) 1989

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GEOLOGICAL CROSS SECTION OF STUDY AREA

FIGURE 1-6

The Upper Glacial aquifer, consisting of highly permeable sand and gravel with occasional thin clay beds, is more commonly used for drinking water in eastern Suffolk County than in the more densely populated western Suffolk County in which the landfill is located. The Upper Glacial aquifer is approximately 100 feet thick in the study area.

The Upper Pleistocene deposits lie unconformably above the Gardiners Clay, where present, or otherwise directly upon the Magothy formation and are generally believed to represent the basal Pleistocene deposit where present throughout Long Island. The Gardiners Clay, which consists of clay interbedded with sand, silt and gravel, has been reported to be approximately 9 feet thick in the study area (Sorensen, 1979). The Gardiners Clay is an extensive clay layer which is reported at an elevation of approximately 50 feet below mean sea level in the vicinity of the site.

The Magothy aquifer is the principal water supply aquifer underlying Suffolk County. It consists primarily of lenticular beds of very fine to medium sand that are interbedded with clay and sandy clay, silt, and some gravel and sand. Discontinuous layers of gray lignitic clay are common in the upper zones of this aquifer. The Magothy reaches a thickness of approximately 750 feet beneath the site (Franke and McClymonds, 1972).

1.3.9.1 - Groundwater Flow Patterns

The depths to groundwater measured in the site and study area monitoring wells during this remedial investigation ranged from approximately 7 to 28 feet below ground surface. Based on the latest Suffolk County Department of Health Services (SCDHS) groundwater contour map, entitled "Water Table Contours and Locations of Observation Wells in Suffolk County, NY - March 1997", the regional groundwater flow direction in the vicinity of the Sonia Road Landfill is southeast; however, groundwater flow changes to a south-southeast direction south of the site. The local groundwater flow direction as determined by the results of this investigation is to the southeast.

1.3.10 Water Supply

Potable water in the vicinity of the Sonia Road Landfill is supplied by the Suffolk County Water Authority (SCWA). Private wells also exist in the study area which are typically used for industrial and commercial purposes. The results of a detailed private/public water supply well survey for the study area is presented in Section 2.10 of this report.

1.4 Site History

According to the Town of Islip report dated June 1982, prior to 1965, the site of the Sonia Road Landfill was a sand and gravel mining facility. Based on this report and historical aerial photographs, sand and gravel was excavated below the water table, which created a groundwater lake at the site. The Town operated the site as a municipal solid waste landfill from 1965 to 1977, with the most active period of landfilling occurring between 1965 and 1974. During most of its operational period, the landfill accepted all types of municipal solid waste, however, during the last few years of operation, the landfill accepted only refuse, rubbish, demolition material and yard waste, particularly leaves. In the early years of operation, this site was used for disposal of junk automobiles. Based upon the final property grade, the Town report estimated that buried refuse averages 50 feet deep over 60% of the site.

In addition to municipal solid waste, according to a memorandum prepared in October 1980 by Suffolk County Department of Health Services, a Hooker Chemical Corporation document dated August 21, 1978 indicated a landfill in the Brentwood area allegedly received 400 cubic yards of hazardous materials from Hooker Chemical Corporation. These wastes reportedly consisted of gravel containing polyvinyl chloride, trimellitate plasticizers, 2 ethylhexanol and other alcohols. The wastes were allegedly disposed at the Brentwood landfill from 1973 to 1974. The memorandum further explains that although attempts were made to identify the "Brentwood site" the disposal location was never confirmed. In fact, the memorandum indicated that the site referred to could be one of four sites in the area. According

to the NYSDEC Immediate Investigation Work Assignment (IIWA) Work Plan dated July 1994, there have been unconfirmed allegations that trichloroethene and plating sludge may have been received at the landfill. Provided below is a historical description of waste filling activities at the Sonia Road Landfill.

1.4.1 Historical Photograph Review

Historical aerial photographs of the Sonia Road Landfill from 1962 through 1996 were reviewed in order to evaluate past filling activities and the extent of waste disposal. A discussion of this review is provided below.

1962 Aerial Photograph

An aerial photograph obtained for 1962 showed active sand mining on-site. A large portion on the site had been excavated to the water table which was identified by the existence of a large groundwater "lake" on-site. The site had been cleared to what appears to be the property line to the north and south. The extreme eastern portion of the site was not cleared to the property line. A tree line between the residences and the site remained. A portion of the western side of the site remained uncleared. This area extended from just north of the existing residence on Corbin Avenue to the southern property line along Deer Park Street.

1966 Aerial Photograph

By 1966, filling activities began on-site. This photograph indicated that the western portion of the site was filled first. Water was no longer present in the extreme western portion of the large excavation; however, water was still noted in the excavation on the eastern portion of the site. Almost the entire site has been cleared with the exception of the area surrounding the residence on the western side of the site and the northeast and southeast corners.

1969 Aerial Photograph

Sand and gravel mining equipment was still noted to be on-site in the 1969 aerial photograph. Mining activities may have continued in the northwestern portion of the site as noted by a pond in this area of the site. Filling activities had increased and the large excavation previously noted as a "lake" was no longer present on the site. The northeast and southeast corners of the site, as well as the area surrounding the residence on the west, remained undisturbed.

1972 Aerial Photograph

The 1972 aerial photograph indicates that the entire site is cleared and scarred with the exception of the southwestern portion. Previous existence of trees along the southern border and northeast and southeast corners are no longer present. A dirt road leads through the center of the site from the Sonia Road entrance to the Corbin Avenue entrance. Trucks appear to enter through the Sonia Road entrance and dispose of waste on the extreme eastern portion of the site midway between Sonia Road and Deer Park Street. Apparent waste material is noted along the eastern property line and possibly beyond the property line. Piles of debris are noted throughout the site with filling activities noted in the northwestern portion of the site. Although it is difficult to discern accurately because the property line cannot be clearly defined, waste may have been disposed beyond the property line in this area.

1977 Aerial Photograph

By 1977, the eastern portion of landfill has been made into a sports field. Disposal activities appear to continue on the western portion of the site. The large berm extending through the center of the site is present for the first time.

1984 Aerial Photograph

The sports fields are not as clearly discernible in the 1984 photograph and therefore may no longer be in use. Dirt roads are noted on-site indicating some on-site activities.

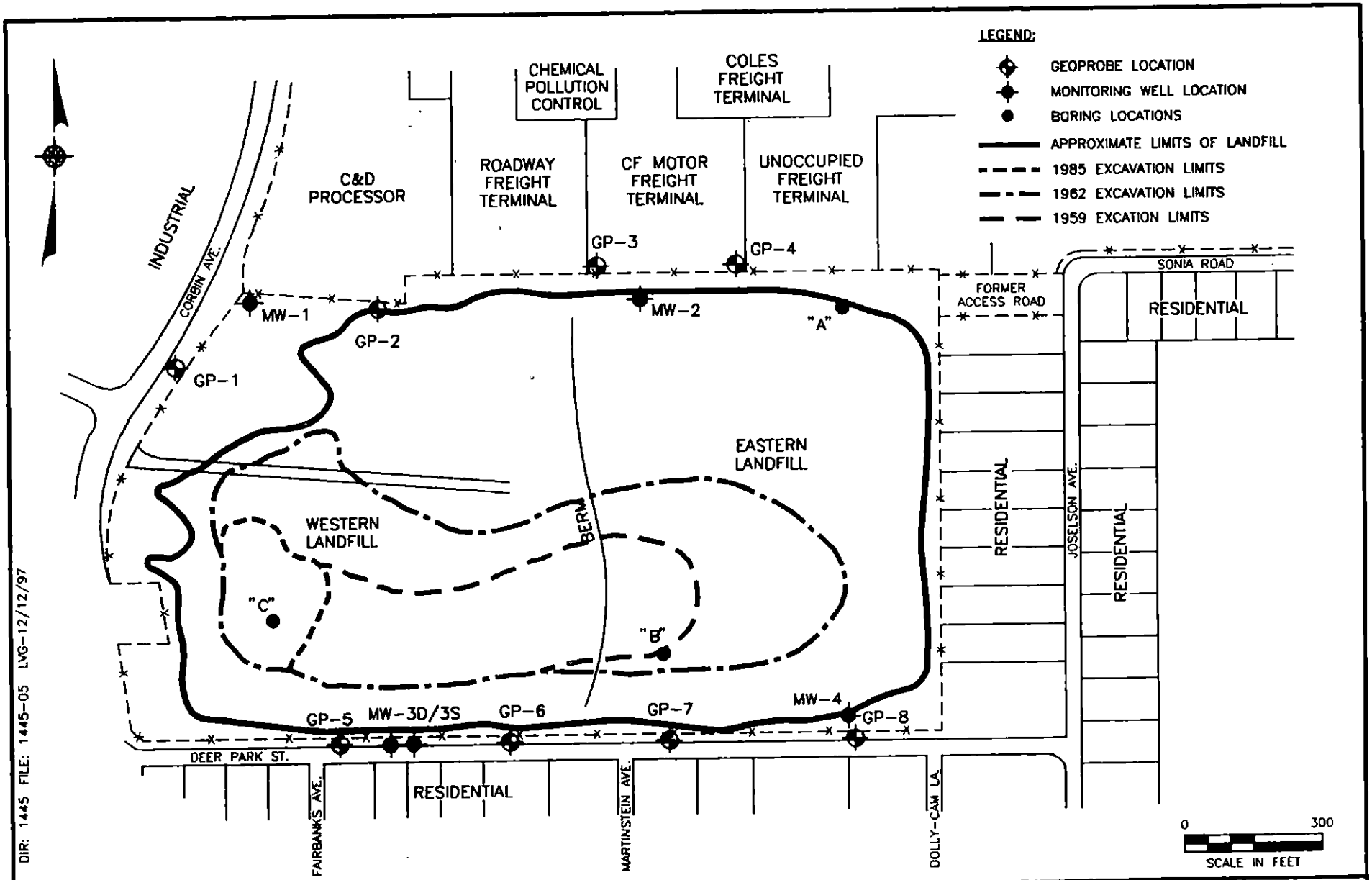
1.5 Findings of Previous Investigations

A number of studies were conducted on and in the vicinity of the Sonia Road Landfill prior to this remedial investigation. Provided below is a summary description of these previous studies. Information from these studies was used in the development of the remedial investigation field program.

1.5.1 1975 Holzmacher, McLendon and Murrell Study

In 1975 Holzmacher, McLendon and Murrell, P.E. Consulting Engineers (H2M) prepared a report, entitled "A Study of Leachate at Landfill Sites." As part of this study, three test borings were constructed within the Sonia Road Landfill. One test boring was constructed in the western portion of the landfill and two borings were constructed in the eastern portion of the landfill (see Figure 1-7). Boring "A," constructed in the northeastern portion of the landfill, indicated the presence of at least 29 feet of refuse. Boring "B," constructed in the southwestern corner of the eastern portion of the landfill, also indicated the presence of 29 feet of refuse, with refuse noted 6 feet below the water table. Boring "C," constructed in the southwestern portion of the landfill, indicated the presence of refuse at least 35 feet below ground surface of which at least 11 feet was below the water table.

Refuse in the eastern portion of the site was described as consisting of wood, roots, glass, plastic, metal and general rubbish. The refuse in the western portion of the landfill was described as containing wood, glass, plastic, metal, cardboard, concrete and household wastes.



SONIA ROAD LANDFILL
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PREVIOUS SAMPLING LOCATIONS

FIGURE 1-7

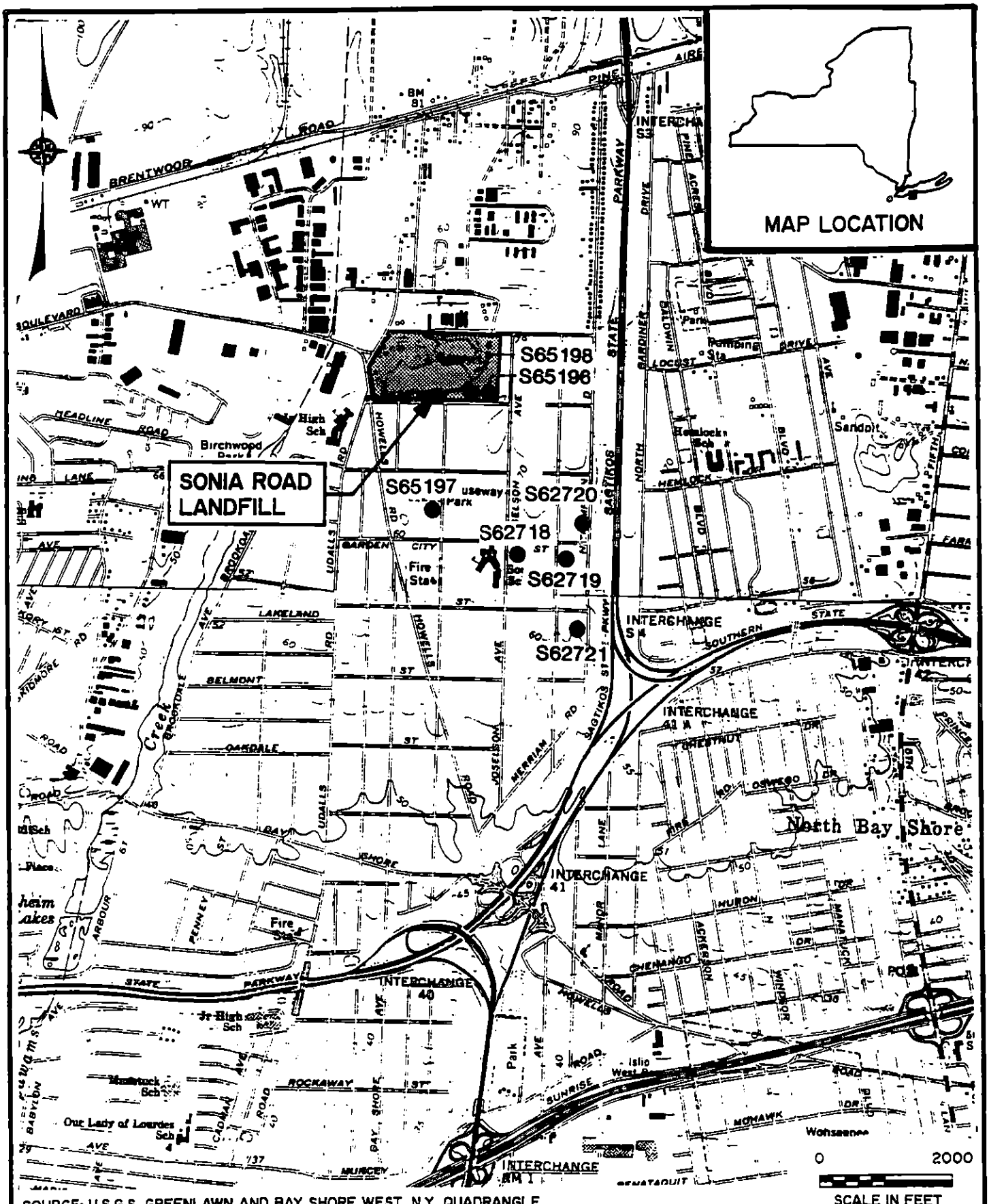
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1.5.2 1979 Suffolk County Department of Health Services Study

In 1979, the SCDHS prepared a report entitled "Leachate Pollution Plume at the Sonia Road Landfill." As part of the investigation of the landfill, 19 temporary leachate exploration wells were installed at various locations southeast and downgradient of the site, and one well was installed on the southeast edge of the site. All of the downgradient wells were installed to a depth of approximately 80 feet below ground surface. The one well installed on the landfill was installed deeper to a depth of 108 feet to determine the stratigraphy at the site and to obtain deep groundwater samples for analysis.

For the 19 downgradient wells, sampling of the groundwater was conducted by initially placing the well screens to approximately 80 feet below ground surface. Water was pumped from the well, and after "sufficient" pumping, a sample was collected and tested for temperature and specific conductivity. The well screen was then raised 10 feet by raising the entire casing and the well was pumped again and another sample was collected. This procedure continued until the final screen setting was immediately below the water table.

Based on the distribution of wells and the conductivity measurements, a leachate plume was delineated. The plume was reported to extend from the landfill for a distance of 3,800 feet toward the southeast. The plume's maximum width was determined to be 2,300 feet and its thickness was determined to be approximately 90 feet limited in depth by the Gardiners Clay. The report indicated that four of these screening wells were left as permanent wells to be used for future monitoring of the leaching edge of the plume. These wells were designated S62718, S62719, S62720 and S62721 (see Figure 1-8). According to an interoffice memorandum from SCDHS dated May 8, 1979, the four wells were screened at the depth of the "worst" leachate encountered as determined by conductivity measurement. Conductivity levels ranged from 78 umhos to 2000 umhos in this zone.



SOURCE: U.S.G.S. GREENLAWN AND BAY SHORE WEST, N.Y. QUADRANGLE

SONIA ROAD LANDFILL
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SCDHS MONITORING WELL LOCATIONS

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FIGURE 1-8

1.5.3 1982 Suffolk County Department of Health Services Study

According to a SCDHS news release dated August 1982, six SCDHS wells were sampled near the Sonia Road Landfill to detect the possible presence of vinyl chloride. Additionally, eight public water supply wells in the area operated by Suffolk County Water Authority and four private wells were also sampled. The news release indicated that one well on the outer edge of the "plume" detected vinyl chloride exceeding the detection limit of 0.7 ug/l. None of the other wells indicated the presence of vinyl chloride above the detection limit. Based on these results, the news release indicated that it would be difficult to attribute the vinyl chloride to the landfill. The news release further indicated there is no evidence to prove that the vinyl chloride did come from the landfill. The results from the private and public water supply wells were not specifically addressed; however, a statement from the Suffolk County Health Commissioner recommended all private well owners connect to public water supply.

1.5.4 1981-1983 Suffolk County Department of Health Services Monitoring Program

In addition to the sampling discussed in the 1982 study above, SCDHS collected several groundwater samples from the six downgradient wells between 1981 and 1983. (The locations of these wells are shown in Figure 1-8.) SCDHS also collected one sample from a residential well located approximately 1,000 feet south of the landfill. A summary of the results was provided in the report prepared by Golder Associates for the Islip Resource Recovery Agency in June 1995.

The results of one sample collected from the residential well located at 112 Brentwood Street indicated the presence of 1,1,1-trichloroethane at 3 ug/l. This level is less than the New York State Department of Health (NYSDOH) drinking water standard for this compound which is 5 ug/l. No other volatile organics analyzed for were detected. Well S62721 was sampled in August 1982 and indicated the presence of vinyl chloride at 9 ug/l. This well was resampled two weeks later and indicated the presence of vinyl chloride at 6 ug/l. Both levels are greater than the NYSDOH drinking water standard for vinyl chloride which is 2 ug/l. This well is approximately

3,700 feet southeast of the landfill and was reported to be within the vicinity of the area of impacted groundwater as defined by 1979 SCDHS investigation.

1,1-Dichloroethane and 1,1-dichloroethene were detected at concentrations of 36 ug/l and 9 ug/l, respectively, in well S62718 in November 1983. Well S62720 indicated the presence of 1,1-dichloroethene at 5 ppb during this sampling event, and levels of cis-dichloroethene, benzene and chlorobenzene were detected in S62721 at 20 ug/l, 5 ug/l and 7 ug/l, respectively. All of these levels are equal to or greater than the drinking water standards.

1.5.5 1983 NYSDEC Phase I Investigation

In June 1983, Woodward-Clyde Consultants, under contract to NYSDEC, prepared a Phase I Preliminary Investigation report for the Sonia Road Landfill. The investigation comprised compilation of pertinent background information on the site. Preliminary Hazard Ranking Score (HRS) Work Sheets were prepared and site history, site hydrogeology and past sampling and analysis were evaluated. Based on the results of this background information review, additional investigation, which included site specific sampling and analysis under a Phase II Investigation, was recommended; however, a Phase II Investigation was never performed for the site.

1.5.6 1993 NYSDEC Sampling Program

In a May 19, 1993 letter from NYSDEC to SCDHS, the NYSDEC indicated they sampled wells S62720 and S62721. These wells are one-half mile and three quarters of a mile downgradient from the landfill, respectively. Of the monitoring wells sampled between 1981 and 1983 by SCDHS, these were the only remaining usable wells. Both wells are 80 feet deep and screened between 75 and 80 feet. The NYSDEC reported that sample results from these wells indicated low levels of chlorinated hydrocarbons present in the groundwater. Specifically, the results indicated 25 ug/l of trichloroethene in S62720 and 350 ug/l in S62721. Other compounds, such as tetrachloroethene at 25 ug/l, 1,1,1-trichloroethane at 22 ug/l and 1,2-dichloroethene at 27

ug/l, were also detected in S62721. 1,1-Dichloroethane at 5 ug/l and 1,2-dichloroethene at 4 ug/l were detected in S62720. Vinyl chloride was not detected in either sample.

Although low levels of chlorinated hydrocarbons were detected, NYSDEC did not feel that these wells directly monitored the landfill. Specifically, NYSDEC indicated that there were several potential sources upgradient of the landfill which could be responsible for the volatile organic compounds detected. In particular, they identified the Baron Blakeslee site and the Chemical Pollution Control site. The NYSDEC further indicated that a sample from one of Chemical Pollution Control's monitoring wells was used as an upgradient well for the landfill. This well indicated that similar volatile organic compounds are present in the groundwater upgradient of the landfill as compared to downgradient. As a result, NYSDEC requested assistance from SCDHS to install five water table wells and one deep monitoring well in the immediate vicinity of the landfill. These monitoring wells were never installed.

1.5.7 1994 NYSDEC Immediate Investigation Study

In response to correspondence exchanged between the Town of Islip and NYSDEC addressing delisting of the Sonia Road Landfill and/or reassessment of the basis for the original designation of the landfill as a Class 2 site, NYSDEC developed an Immediate Investigation Work Assignment Work Plan (IIWA) for the installation of eight Geoprobes along the perimeter of the landfill (see Figure 1-7).

The eight Geoprobes were installed in August 1994. Based on NYSDEC interpretation of groundwater flow in the south-southeast to southeast direction, eight Geoprobes were installed in August 1994. Four Geoprobes were located upgradient of the landfill and four located downgradient. Two groundwater samples were collected from each Geoprobe location, one just below the water table (13 to 29 feet below ground surface) and one approximately 30 feet below the shallow samples (43 to 59 feet below ground surface). The depth for the deeper samples was determined by field screening of the groundwater at 30 feet below the water table, 40 feet below

the water table and 50 feet below the water table for alkalinity, specific conductivity and temperature at a downgradient Geoprobe location.

The Geoprobe screening depths were selected based upon information contained in the 1979 SCDHS report, which indicated that groundwater at 43 feet below the water table had the highest specific conductivity, while groundwater at 53 feet below the water table had the highest temperature. The inability to drive the Geoprobes to deep depths was also a factor in the selection of the screening depths. As discussed in the IIWA Work Plan, NYSDEC surmised that the selected sampling depths would be the most likely depth to intercept any of the alleged chemical wastes disposed at the landfill moving with groundwater.

All groundwater samples were analyzed for Target Compound List (TCL) +10 volatile organic compounds (VOCs) and TCL metals. In addition, TCL +20 semivolatile organic compounds were analyzed for each of the shallow samples. TCL pesticides/PCBs and cyanide were only analyzed for the shallow sample obtained at location GP-6. Preliminary, unvalidated results of these samples are provided in Table 1-1. As shown in this table, the results of the sampling indicate the presence of several VOCs above Class GA groundwater and NYSDOH drinking water standards. The shallow samples (ranging in depth from between 13 to 29 feet below ground surface) are designated as S1 through S8 (S1-S4 are upgradient and S5-S8 are downgradient). The deep samples (ranging in depth from between 43 to 59 feet below ground surface) are designated as D1 through D8 (D1-D4 are upgradient and D5-D8 are downgradient).

Low levels (levels below or slightly above the standards) of 1,1-dichloroethane were detected in all of the upgradient samples, except D3 and D4. Low levels of 1,1,1-trichloroethane were also detected in D1, S2, D2 and S4. All of the shallow Geoprobe locations, and 5 of 8 of the deep locations, indicated low levels of VOCs less than 33 ug/l.

The sample collected from D4 exhibited the highest level of VOCs in any of the upgradient samples (total VOCs of 359 ug/l). The compounds detected were primarily tetrachloroethene, trichloroethene, 1,2-dichloroethene and vinyl chloride.

TABLE 1-1
SONIA ROAD LANDFILL
PRELIMINARY GROUNDWATER SAMPLING RESULTS
VOLATILE ORGANICS
AUGUST 1994

SAMPLE IDENTIFICATION	S1	D1	S2	D2	S3	D3	S4	D4	NYSDOH/SCDHS DRINKINGWATER STANDARDS	NYSDEC CLASS GA GROUNWATER STANDARDS
VOLATILE ORGANICS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Vinyl Chloride	U	U	U	U	U	U	U	33	2 ST	2 ST
Chloroethane	U	U	U	U	U	U	5 J	U	5 ST	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5 ST	5 ST
1,1-Dichloroethane	2 J	7 J	4 J	13	4 J	U	5 J	U	5 ST	5 ST
1,2-Dichloroethene	U	U	U	U	U	U	6 J	170	5 ST	5 ST
1,1,1-Trichloroethane	U	6 J	1 J	9	U	U	3 J	U	5 ST	5 ST
Trichloroethene	U	U	U	U	U	U	9 J	46	5 ST	5 ST
Benzene	U	U	U	U	U	U	U	U	5 ST	0.7 ST
Tetrachloroethene	U	U	3 J	U	U	2 J	5 J	110 BD	5 ST	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5 ST	5 ST
Xylene(total)	U	U	U	U	U	U	U	U	5 ST*	5 ST*
TOTAL VOCs	2	13	8	22	4	2	33	359		

SAMPLE IDENTIFICATION	S5	D5	S6	D6	S7	D7	S8	D8	NYSDOH/SCDHS DRINKINGWATER STANDARDS	NYSDEC CLASS GA GROUNWATER STANDARDS
VOLATILE ORGANICS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Vinyl Chloride	U	U	U	U	U	63	U	U	2 ST	2 ST
Chloroethane	5 J	190	16	U	12	U	8 J	10 J	5 ST	5 ST
1,1-Dichloroethene	U	140	U	U	U	U	U	U	5 ST	5 ST
1,1-Dichloroethane	U	670 D	U	4 J	U	1 J	U	U	5 ST	5 ST
1,2-Dichloroethene	U	U	U	2 J	U	140	U	U	5 ST	5 ST
1,1,1-Trichloroethane	U	1400 D	U	U	U	U	U	U	5 ST	5 ST
Trichloroethene	U	11	U	U	U	U	U	U	5 ST	5 ST
Benzene	U	U	U	U	9 J	U	4 J	U	5 ST	0.7 ST
Tetrachloroethene	U	U	U	U	U	7 JB	2 JB	2 JB	5 ST	5 ST
Chlorobenzene	U	U	2 J	U	11	U	3 J	3 J	5 ST	5 ST
Xylene(total)	U	U	U	U	2100 D	1 J	U	U	5 ST*	5 ST*
TOTAL VOCs	5	2411	18	6	32	211	17	15		

QUALIFIERS
B: Compound found in the method blank as well as the sample
D: Result taken from the diluted analysis
J: Compound found at a concntration below the CRDL, value estimated
U: Compound analyzed for but not detected

NOTES
ST: Standard
ST*: Standard is for each isomer
[ ]: Exceeds drinking water or groundwater standards

Based on review of data in the SCDHS files, it appears that the likely source of contamination at Geoprobe location D4 is from the former Baron-Blakeslee (Aircraft Turbine Services) facility, where investigations conducted on-site and off-site detected similar VOCs. In fact, a 1986 Hydrogeologic Investigation and Evaluation of Off-Site Recovery Systems, prepared for Aircraft Turbine Services, showed a projected contaminant plume from the site crossing the northeast corner of the Sonia Road Landfill in the area of D4. This potential source of contamination is discussed further in the next section.)

Based on the results from D4, similar contaminant levels would be anticipated immediately downgradient of this location. The sample collected from D8 would be the expected downgradient sample based upon a south-southeast groundwater flow direction interpretation. However, the results of the analysis of sample D8 only indicated a trace level of tetrachloroethene (in addition to 10 ug/l of chloroethane). None of the other compounds detected at elevated levels in D4 were detected in D8.

The results of the analysis for sample D7 are, however, similar to the results of D4. Elevated levels of 1,2-dichloroethene and vinyl chloride, as well as tetrachloroethene, were detected at this location. This could be a result of an error in sample labeling or handling either in the field or in the laboratory where samples D7 and D8 were inadvertently switched, or the result of possible "channeling" of groundwater due to the heterogeneity of waste material below the water table. This "channeling" could affect groundwater flow direction in the immediate vicinity of the landfill.

Sample D5 collected on the southwestern portion of the landfill exhibited the highest levels of contamination (total VOCs of 2,411 ug/l). 1,1,1-trichloroethane was detected at 1,400 ug/l. Elevated levels of 1,1-dichloroethane and chloroethane, which are breakdown products of 1,1,1-trichloroethane, as well as 1,1-dichloroethene, were also detected in this sample. In addition, a lower level of trichloroethene was detected. Based on measured groundwater flow direction, a Geoprobe sample may not have been collected directly upgradient of this location. Therefore, although other samples collected upgradient of the landfill (other than D4) do not indicate the presence of these compounds at elevated levels, there is not conclusive evidence that this

contamination is emanating from the landfill, and there could be an upgradient source of contamination originating from the industrial area located northwest of the landfill.

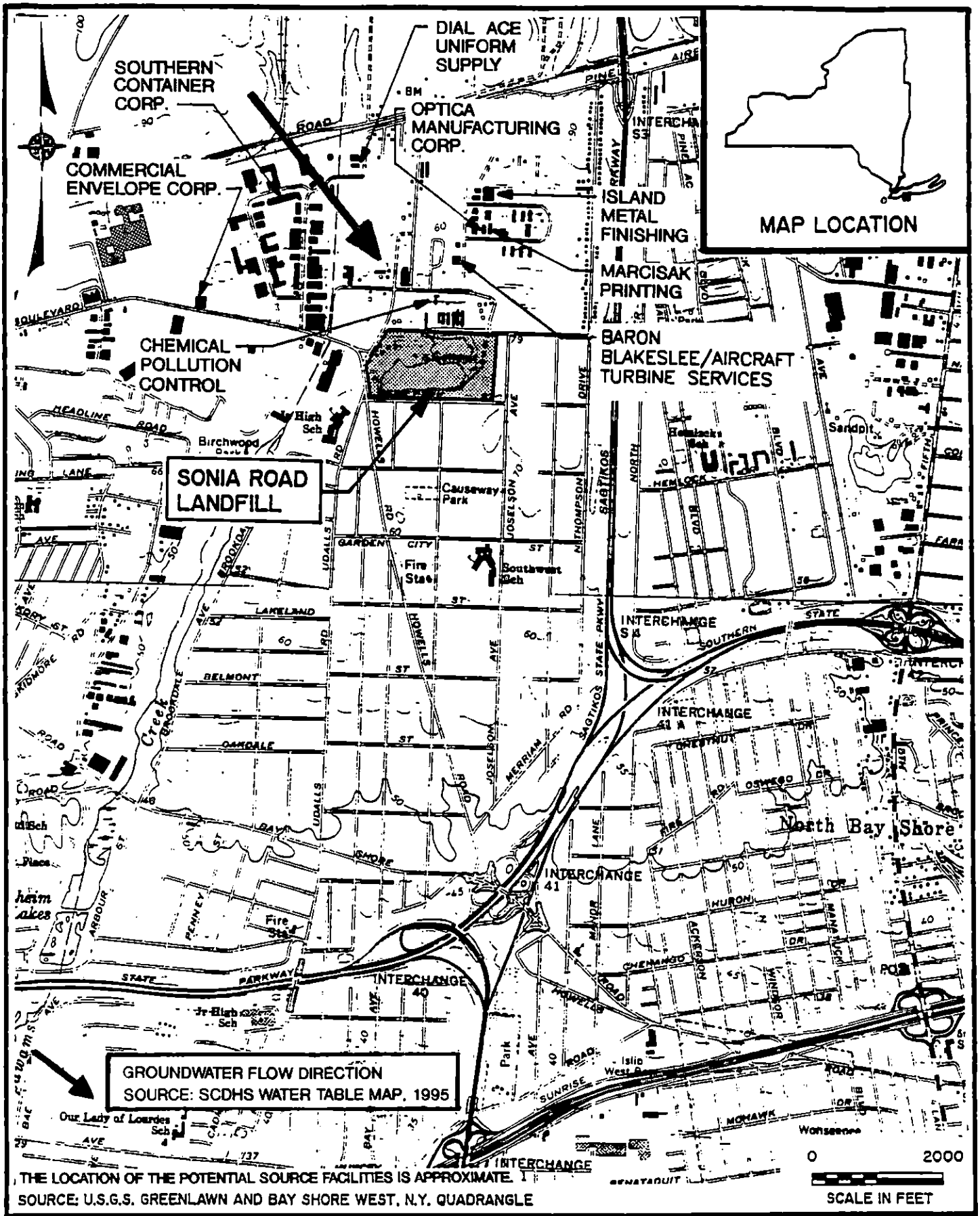
During the review of the preliminary data, it was also noted that all of the deep samples exhibited elevated levels of chromium with seven of eight locations exceeding the groundwater standard of 50 ug/l. Elevated levels were detected both upgradient and downgradient of the landfill. Although this would indicate that the contamination results from an upgradient source, (or perhaps from turbid samples, although based on a preliminary review, it appears that the samples were filtered), since plating waste was allegedly disposed at the Sonia Road Landfill, the landfill could be the source of this contamination. Based on the results of this study, the Class 2 designation for the Sonia Road Landfill was not changed.

1.5.8 1995 Golder Associates Study

As discussed above, Golder Associates prepared a Hydrogeologic Assessment Report for the Sonia Road Landfill for the Islip Resource Recovery Agency dated June 1995. The report provides a brief hydrogeologic assessment of existing data, including utilization of data from wells installed upgradient and downgradient of the landfill in 1995. The report also contains a description of groundwater quality and site history, as well as recommendations for future actions at the site. The report concluded that groundwater at the site flows in a southeast direction and that there is significant evidence that groundwater at and downgradient from the site is being impacted by upgradient sources. The report recommended that additional information be collected, both upgradient and downgradient of the site, to better define the impact of upgradient sources of contamination.

1.6 Information on Potential Upgradient Sources

As part of the remedial investigation, a windshield survey and an information search was conducted to identify potential sources of contamination upgradient of the Sonia Road Landfill that could cause groundwater contamination in the vicinity of the landfill. The area of interest focused on the industrial facilities located north and northwest of the landfill (see Figure 1-9).



THE LOCATION OF THE POTENTIAL SOURCE FACILITIES IS APPROXIMATE.

SOURCE: U.S.G.S. GREENLAWN AND BAY SHORE WEST, N.Y. QUADRANGLE

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

POTENTIAL UPGRADIENT SOURCE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1-9

The windshield survey identified the current names of the industrial facilities. Under a Freedom of Information Act (FOIA) request, the list of industries was provided to both NYSDEC and SCDHS to review any files on these industries that the agencies may have. Upon receipt of approval, the files provided by the NYSDEC and SCDHS were reviewed at the agencies' offices.

In addition to the above windshield survey and review of NYSDEC and SCDHS files, a review of the NYSDEC Registry of Inactive Hazardous Waste Sites was undertaken to identify any other sites that were not identified as a result of the industrial area survey. These sites could have occupied facilities under different ownership and name. File information on these sites was also requested from NYSDEC under FOIA and any information provided was reviewed at the Department's office. The results of this information regarding potential upgradient sources of contamination is provided below. The locations of these potential sources are shown on Figure 1-9.

1.6.1 Baron-Blakeslee

The former Baron-Blakeslee facility is located at 86 Cleveland Street. This site is on the United States Environmental Protection Agency (USEPA) Region II CERCLIS 3 Report. The site is also known as the Aircraft Turbine Services (ATS) Site. Currently, the facility name is UNC Accessory Services. Based on a review of SCDHS files, the County has been involved in investigating this site since 1978. Samples collected from on-site storm drains by Suffolk County Department of Environmental Control in October 1978 indicated elevated levels of tetrachloroethene (as high as 1,600 ug/l), trichloroethene (as high as 10,000 ug/l) and trichloroethane (as high as 14,000 ug/l). Baron Blakeslee entered into an Order on Consent with NYSDEC in July 1979 to address the on-site contamination. Several reports have been prepared by Woodward-Clyde Consultants for Baron-Blakeslee and by ERM-Northeast for ATS. The reports that were reviewed at the office of SCDHS include the following:

1. Baron-Blakeslee, Inc. Engineering Report, Woodward-Clyde, 1982;

2. Remedial Action Groundwater Studies, Baron-Blakeslee, Inc., Woodward-Clyde, February 1984;

3. Status Report, Baron-Blakeslee, Inc., Woodward-Clyde, January 24, 1985;

4. Installation and Sampling of Monitoring Wells - Aircraft Turbine Services, Inc. Bay Shore, New York, ERM-Northeast, September 1985;

5. Hydrogeologic Site Assessment - Aircraft Turbine Services, Inc., ERM-Northeast, November 1985; and

6. Hydrogeologic Investigation and Evaluation of Off-site Recovery Systems - Aircraft Turbine Systems, ERM-Northeast, February 1986.

Based on the results of sampling sediment from an on-site catch basin (dry well) by Woodward-Clyde in 1984, elevated levels of trichloroethene (410,000 ug/kg), 1,1,1-trichloroethane (2,700,000 ug/kg) and tetrachloroethene (66,000 ug/kg) were detected. Elevated levels (greater than 10,000 ug/kg) of 1,1-dichloroethane and 1,1-dichloroethene were also detected in this sediment sample.

Based on the results of these dry well samples, several groundwater monitoring wells were installed. Based on the results of the groundwater samples collected from the on-site wells, a groundwater recovery and treatment system was installed in late 1984 and became operational in January 1985. This system consisted of an extraction well, two air stripping towers and three recharge wells. On-site pumping and treatment of the contaminated groundwater occurred from 1985 to January 1989. Pumping was discontinued as a result of the terms and conditions of the consent order being met.

An evaluation was also conducted by ERM-Northeast to determine the need for installation of an off-site groundwater remediation system, and several wells were installed off-site. Results of the analysis of a sample collected from off-site well ATS-1 in January 1986 indicated the presence of 1,1-dichloroethane at 290 ug/l, 1,2-dichloroethene at 4,200 ug/l, 1,1,1-trichloroethane at 950 ug/l, trichloroethene at 110 ug/l and tetrachloroethene at 140 ug/l. Based on these results, an off-site plume of contaminated groundwater was defined by ERM-Northeast

which crosses the northeast corner of the Sonia Road Landfill (see Figure 1-10). Although these significantly elevated levels of volatile organic compounds were detected in off-site wells, ERM-Northeast recommended not to install an off-site groundwater remediation system, and a remediation system was never installed.

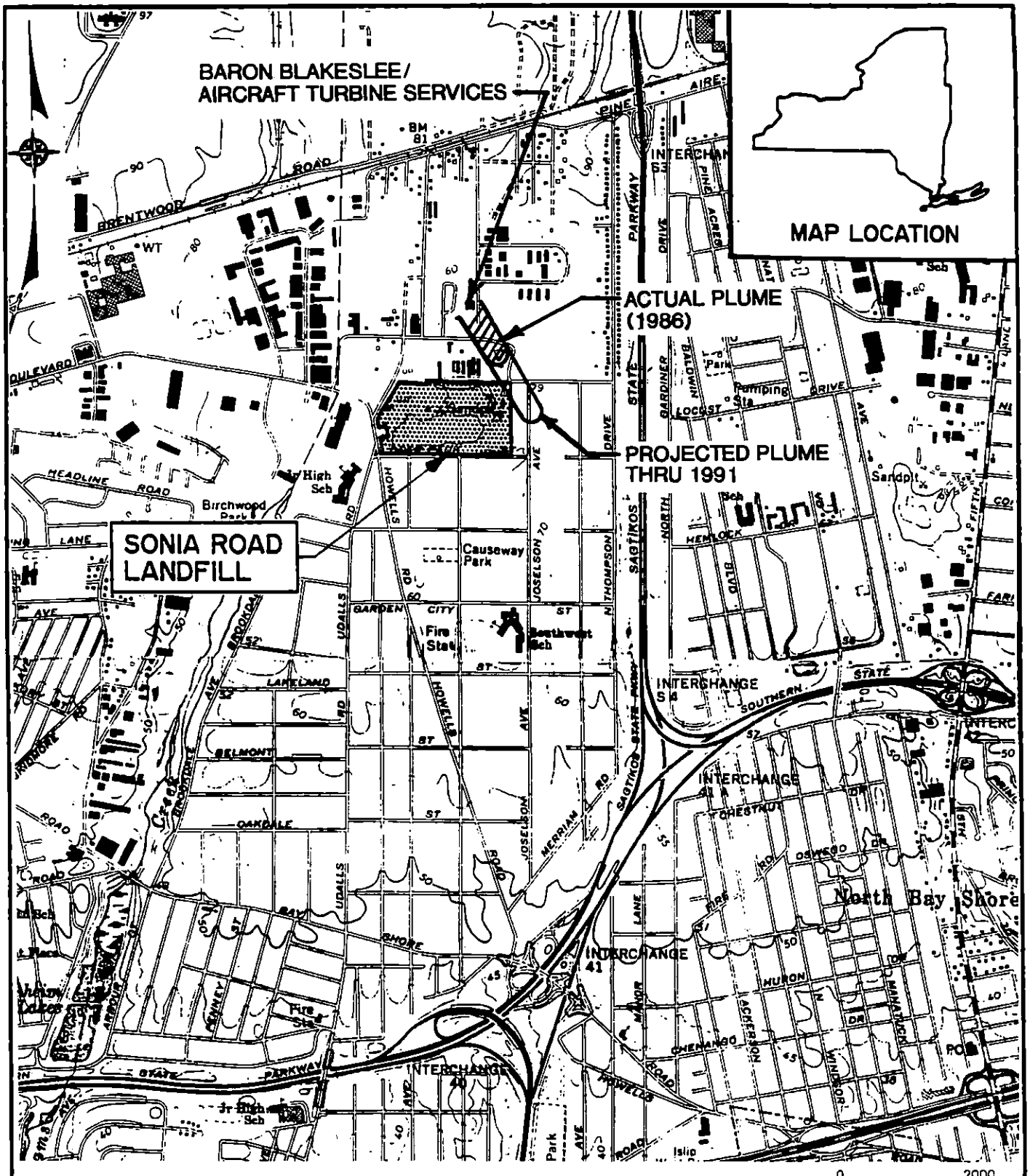
1.6.2 Dial Ace Uniform Supply

Dial Ace Uniform Supply, Inc. is located at 30 Dunton Avenue. According to SCDHS files, samples were collected from on-site cesspools in 1981 and 1982. Results of these samples indicated the presence of elevated levels of volatile organic compounds, including tetrachloroethene as high as 2,900 ug/l, 1,1,2-trichloroethene as high as 1,200 ug/l and 1,2,4-trimethylbenzene as high as 37,000 ug/l. As a result of these samples, nine groundwater monitoring wells were installed in March 1984. Results from the analysis of samples collected from these wells indicated the presence of VOCs, including vinyl chloride as high as 9 ug/l, 1,1,1-trichloroethane as high as 110 ug/l, 1,1,2-trichloroethene as high as 130 ug/l and cis-dichloroethene as high as 92 ug/l.

1.6.3 Chemical Pollution Control

According to the NYSDEC Inactive Hazardous Waste Report dated October 1997, Chemical Pollution Control, Inc., (CPC) is a NYSDEC Class 2a site (#152015) located at 120 South 4th Street. Chemical Pollution Control operates a commercial storage, treatment and transfer facility. Eight tanks are located on site to store and treat hazardous waste including oils, non-halogenated solvents, other ignitable hazardous wastes, organic wastewater and acids.

According to NYSDEC records, CPC began operations at the site in late 1976 as an industrial waste transfer station. The property formerly housed a milk bottling and distribution company, and a truck tire sales and service company. CPC accepts waste from schools, industrial and manufacturing facilities, and small quantity generators, including but not limited to, doctors,



SOURCE: U.S.G.S. GREENLAWN, N.Y. AND BAY SHORE WEST, N.Y. QUADRANGLE AND ERM NORTHEAST FEBRUARY 1986

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

BARON BLAKESLEE/AIRCRAFT TURBINE PLUME

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1-10

dentists, chiropractors, photo processors, printers, auto body shops, dry cleaners and homeowners. The waste is accepted for shipment to final disposal sites off Long Island.

A review of the SCDHS files indicated that in 1979, wastewater samples were collected three times between May and June by SCDHS from the "rear storm drain." The results of the analysis indicated that pH, dissolved solids, copper, iron, nickel, lead, cadmium, zinc, hexavalent chromium and total chromium were detected at levels above New York State Groundwater Standards. In July 1979, CPC signed an order on consent with the NYSDEC stipulating that they would clean out the storm drain and berm all remaining storm drains on-site.

In 1981, the Suffolk County Department of Health identified ten spills of toxic and hazardous materials at CPC which may pose a threat to the groundwater.

A Phase I Investigation was completed in 1988, and a Phase II Investigation Report was obtained from a review of NYSDEC files. This report was identified as the results for the Groundwater Study Period from May 1987 through May 1988, and was prepared by Chemical Pollution Control, Inc., Volumetric Techniques, Ltd., and American Consulting and Educational Services. Five groundwater monitoring wells were sampled as part of this investigation and analyzed for volatile organic compounds. Levels of VOCs including trichloroethane (2.03 to 188.76 ug/l); trichloroethene (1.09 to 304 ug/l); 1,1-dichloroethene (7.47 ug/l); 1,1-dichloroethane (2.53 to 116.43 ug/l); trans-1,2-dichloroethene (2.72 to 6.4 ug/l); chloroform (18.1 ug/l); 1,1,2,2-tetrachloroethane (4.96 to 17.7 ug/l); and benzene (187.25 to 216 ug/l) were detected.

Five surface soil samples were also collected from the site. The report indicated that the surface soil sample data "shows no significant contamination." Two borings were installed adjacent to two storm drains on-site to a depth of 8 feet. The report indicated that the soil sample data showed that "no significant contamination was found except for iron." The analytical results for the soil samples were not available for review.

In February 1990, NYSDEC provided CPC with a letter which included a review of the Phase II report. The letter provided several comments on the report including inconsistencies in the results of the groundwater analysis. Split samples collected by NYSDEC from wells MW-1, MW-3 and MW-4 on July 21, 1987, indicated that the results for MW-3 were higher for 1,1,1-trichloroethane and trichloroethene as compared to the results presented in the Phase II report. As a result, the NYSDEC recommended that all of the monitoring wells be resampled, additional surface and subsurface soil samples be collected and the Phase II report be rewritten. In April 1990, CPC's consultant provided a letter to NYSDEC indicating they would comply with the recommendations provided in their comment letter of February 1990.

In December 1991, a sample was collected from a dry well at the CPC facility by the SCDHS. The sample indicated the presence of cis 1,2-dichloroethene, 1,2,4-trimethylbenzene, aluminum, barium, copper, iron, lead, manganese and zinc above New York State and Suffolk County discharge standards. According to the correspondence available in the file, the contamination was a result of activities by a previous tenant in this portion of the building, F&B Trucking. According to information provided in SCDHS files, this dry well was cleaned out.

A revised Phase II report was prepared for the facility. NYSDEC is planning additional off-site assessment work for the spring of 1998.

1.6.4 Commercial Envelope Manufacturing Co., Inc.

Commercial Envelope Manufacturing Co., Inc. (CEM) is located at 900 Grand Boulevard and has been located at this site since 1976. According to the NYSDEC Inactive Hazardous Waste Disposal Report dated October 1997, the facility is a Class 2a site (#152103). Waste generated from the photograph and printing operations as part of envelope manufacturing was disposed into on-site sanitary systems. According to SCDHS sample results, three areas have been identified that contain elevated levels of solvents and heavy metals. These areas include on-site leaching pools, waste storage tanks and an area adjacent to a trash compactor. Liquid and sediment samples collected from the leaching pools detected methylene chloride (180-

2,100 ppb), tetrachloroethene (11-73 ppb), trichloroethane (4-150 ppb), toluene (93-970 ppb), xylene (55-500 ppb), cis-dichloroethene (160 ppb), 1,3,5-trimethylbenzene (12-190 ppb), copper (0.08-865 ppm), lead (0.4-166 ppm) and zinc (170 ppm).

A Phase I Investigation for this site was completed by EA Science and Technology for NYSDEC in June 1987. A Phase II Investigation work plan was prepared by the NYSDEC in July 1991. The objective of the Phase II Investigation was to collect information required to classify the site. The NYSDEC has provided Commercial Envelope with a generic consent order to perform a Preliminary Site Assessment for the site.

According to NYSDEC, a removal action has been performed at the facility, including removal of contamination associated with the leaching pools and waste storage tanks. A subsequent investigation showed only minor impacts to on-site groundwater. According to NYSDEC, groundwater monitoring will be implemented and the site will likely be reclassified to Class 4 (site properly closed - requires continued management).

1.6.5 Southern Container Corporation

Southern Container Corporation is located at 140 Industry Court. The facility manufacturers corrugated boxes. According to NYSDEC, in the Spring of 1986, a remediation effort was initiated and two on-site monitoring wells were installed and sampled, the results of which indicated the presence of 1,2-dichloroethene at 610 ug/l and 120 ug/l. Based upon these results, a third monitoring well was installed at an upgradient location. Results of samples collected from the upgradient well and one downgradient well in February 1987 did not indicate the presence of 1,2-dichloroethene.

In October 1985, an oil spill inventory form was prepared to address a spill of starch and ink at the facility. As a result of the spill, approximately 47 cubic yards of soil was contaminated. The report indicated that this soil was excavated and removed off-site.

In 1984, a spill was reported to NYSDEC. The spill was to a recharge basin and was reported to be an oil of unknown amount. At the request of the Town of Babylon, the New York State Department of Transportation (NYSDOT) performed an investigation of the site. Sixteen samples were collected by the NYSDOT from several locations on-site. Based upon the results of the analysis, the NYSDOT determined that "there is extensive metal contamination and there appears to be extensive PCB contamination in the area." NYSDOT referred the site to NYSDEC.

In June 1992, SCDHS collected a sample from a leaching pool on site. The results of the analysis indicated the presence of aluminum at 990 ppm, copper at 240 ppm, iron at 4500 ppm, manganese at 30 ppm, zinc at 180 ppm, 1,4 dichlorobenzene at 590 ppb and 1,2-dichlorobenzene at 2,700 ppb. Southern Container was notified by SCDHS to clean out the leaching pool.

In October 1992, material was removed from the leaching pool and an endpoint sample was collected. The results of the endpoint sample still indicated the presence of elevated levels of 1,4 dichlorobenzene and metals.

In November 1993, NYSDEC provided Southern Container Corporation with a letter indicating that the site has been properly remediated and that no further action at the site is required and the site is delisted.

1.6.6 Optica Manufacturing Corporation

According to SCDHS files, Optica Manufacturing Corporation was located at 210 South Fehr Way. The facility performed lens casting manufacturing. As part of this process, methylene chloride and 1,1,1-trichloroethane were used. In July 1986, the SCDHS issued a notice of violation to the facility. Samples collected from a sanitary cesspool indicated the presence of 180 ppb of methylene chloride and 65 ppb of toluene. Lens grinding wastes were also disposed of in a dumpster.

1.6.7 Marcisak Printing

Marcisak Printing was an offset printing facility located at 240 South Fehr Way. Review of SCDHS files indicated that this facility was issued several notices of violation between 1984 and 1985, indicating they were discharging waste photochemicals to a cesspool. A sample collected from the cesspool indicated the presence of phenols, iron, cadmium and silver. By 1986, discharge to the cesspool ceased. No additional information on this site was available at SCDHS.

1.6.8 Island Metal Finishing

Island Metal Finishing was located at 211 B North Fehr Way. According to SCDHS files, in 1983, a sample was collected from a sanitary pool on the property. This sample indicated the presence of copper, iron and lead. By November 1983, the facility had moved to a new location.

1.6.9 Documented Spills

NYSDEC spill files were reviewed to identify any spills that may have occurred in the vicinity of the Sonia Road Landfill. Based upon a review of the files, over 65 spills have occurred in the vicinity of the landfill since February 1978. Of the 65 spills, 13 identified to be in close proximity and upgradient of the site were reviewed. A summary of these spills is provided in Table 1-2.

1.7 Overview of the Remedial Investigation and Report Organization

The Sonia Road Landfill Remedial Investigation was designed as a single phase field program for the characterization of the nature and extent of the contamination at the site, as well as for the identification of other potential sources of contamination in the vicinity of the landfill. In conjunction with the NYSDEC and the Town of Islip, the objectives of the remedial

Table 1-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
DOCUMENTED SPILLS SITES
UPGRADIENT OF SONIA ROAD LANDFILL

Spill No.	Date	Location	Comments
90-06480	9/13/90	Precision Manufacturing 121 E. Industry Court and Grand Boulevard	Unknown petroleum, machine fluids - employees at machine shop dumping waste fluids down storm drain.
90-10172	12/19/90	49 E. Industry Court	Oil ran down driveway.
90-13060	3/22/91	195 N. Fehr Way	1200+ gallons of oil and water recovered with vacuum truck from sanitary system and parking area.
90-06598	9/18/91	Advance Structure Corp. 235 W. Industry Court	Hydraulic oil - had fire in oil pit under machine.
92-01272	4/30/92	161 E. Industry Court	Unknown oil dumped along property fence line - spillage cleaned up. Approximately 2 yards soil removed.
92-11466	1/6/93	Industry Court and Grand Boulevard	Sampawams Creek contaminated (deep olive green color) after fire at company.
93-15177	3/25/94	Synergy Gas Co. Corbin Avenue	Paint routinely dumped into storm drainage system.
94-00482	4/1/94	Preferred Trucking 120 E. Industry Court	One of three drums under pile of debris leaked - numerous 5-gallon containers with residual oil - oil stained pavement.
95-04855	7/21/95	221 W. Industry Court	Dumping of unknown chemicals on-site.
95-07654	9/18/95	Islip Business Corp. 45 S. 4th Street	Unknown petroleum oil stain discovered on-site during facility inspection.
90-02637	6/6/90	65 N. Industry Court	One 10,000-gallon #2 fuel oil tank.
96-10465	11/12/96	General Tire 111 W. Industry Court	Tank line failure - diesel or gas.
91-01237	4/30/91	Rte. 25 near Indian Neck Lane	Waste oil spilled from drums behind Pindar garage.

investigation were developed and the approach designed to meet the needs of the sampling and data analysis programs. The approach of the remedial investigation was to utilize the existing data obtained from previous investigations as the basis for its design. This approach enabled the investigation to focus on the need for additional assessment of soil, groundwater and soil vapor quality data to determine the need for remediation of the landfill site.

The Remedial Investigation Report is presented in a fashion which allows for a logical and ordered progression of the descriptions and findings of the investigation. Section 1.0 discusses the project's objectives and background, as well as a review of the site history and potential sources of contamination in the study area, including a discussion of previous investigations and a summary of their results. Section 2.0 provides a description of the activities conducted during the field program. Section 3.0 describes the results of the physical and environmental characteristics of the study area, including surface features, geology, hydrogeology and ecology. Section 4.0 presents the analytical data and data validation, and discusses the nature and extent of the contamination, including a discussion of the standards, guidelines and criteria for the various sampling media used to evaluate the significance of the data, as well as contaminants, media and areas of concern. Section 5.0 describes the fate and transport of the contaminants of concern detected.

Section 6.0 presents the conclusions and recommendations of the remedial investigation, including discussions on surface soil, subsurface soil and fill material, soil vapor and groundwater, and recommendations for long-term remedial actions based on the overall findings of the investigation.

2.0 STUDY AREA INVESTIGATION

2.1 Site Facilities

Due to the Sonia Road Landfill's proximity to Dvirka and Bartilucci Consulting Engineers' (D&B) Woodbury office and Fenley & Nicol Environmental, Inc.'s (F&N) Deer Park facility, no on-site facilities (office trailers, equipment trailers, etc.), in general, were established at the landfill for D&B or F&N, since equipment, materials and supplies could be readily transported to the site as needed. Fenley & Nicol Environmental, Inc. utilized a semi-trailer for temporary storage of monitoring well supplies for a short period of time between mid-September and mid-October, 1997. This trailer was located near the main west gate entrance to the landfill on Corbin Avenue.

A temporary decontamination pad was constructed between the main west gate entrance and the recharge basin to the south. The pad was constructed of heavy plastic sheeting as a liner, clean sand, and a wooden frame and platform to support equipment. Soil cuttings generated during the drilling activities were placed on the north side of the recharge basin. Decontamination water was drained into the recharge basin. A portion of equipment decontamination was performed immediately adjacent to the recharge basin to expedite drilling and decontamination activities during the period when multiple drill rigs were used for Hydropunch sampling and monitoring well installation.

2.2 Field Activities

The remedial investigation field program for the Sonia Road Landfill comprised the following activities:

- Grid Network Survey
- Soil Vapor/Explosive Gas Survey and Sampling
- Surface Soil Sampling

- Test Pit and Test Trench Construction
- On-Site Soil Borings and Subsurface Soil Sampling
- Hydropunch/Groundwater Screening and Sampling
- Monitoring Well Installation
- Groundwater Sampling
- Water Level Measurements
- Wildlife Habitat Survey
- Surveying

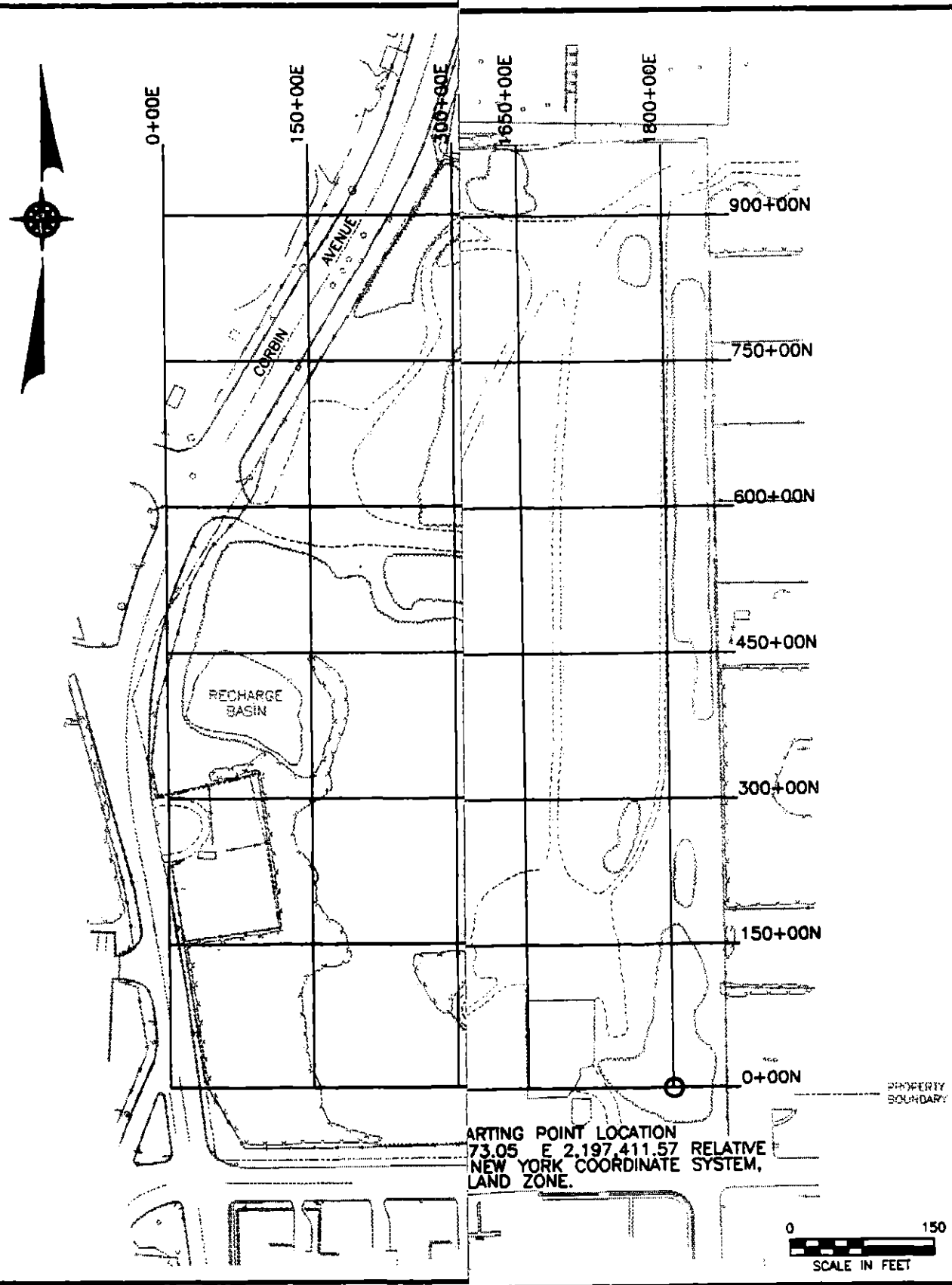
A detailed discussion of these activities is provided below. The results of the field program are presented in Sections 3.0 and 4.0.

2.3 Grid Network Survey

A site-wide grid system was established by YEC, Inc., of Valley Cottage, New York (a New York State Licensed Surveyor) based on a 300-foot grid spacing network referenced from an arbitrary starting point on the site (see Figure 2-1). The grid network was established as a basis to conduct the soil vapor/explosive gas survey and to locate soil borings, test pits and test trenches. The grid network stakeout was measured and staked by YEC between February 25 and 27, 1997, and is tied into the New York State coordinate system, Long Island zone (see Figure 2-1).

2.4 Soil Vapor/Explosive Gas Survey and Sampling

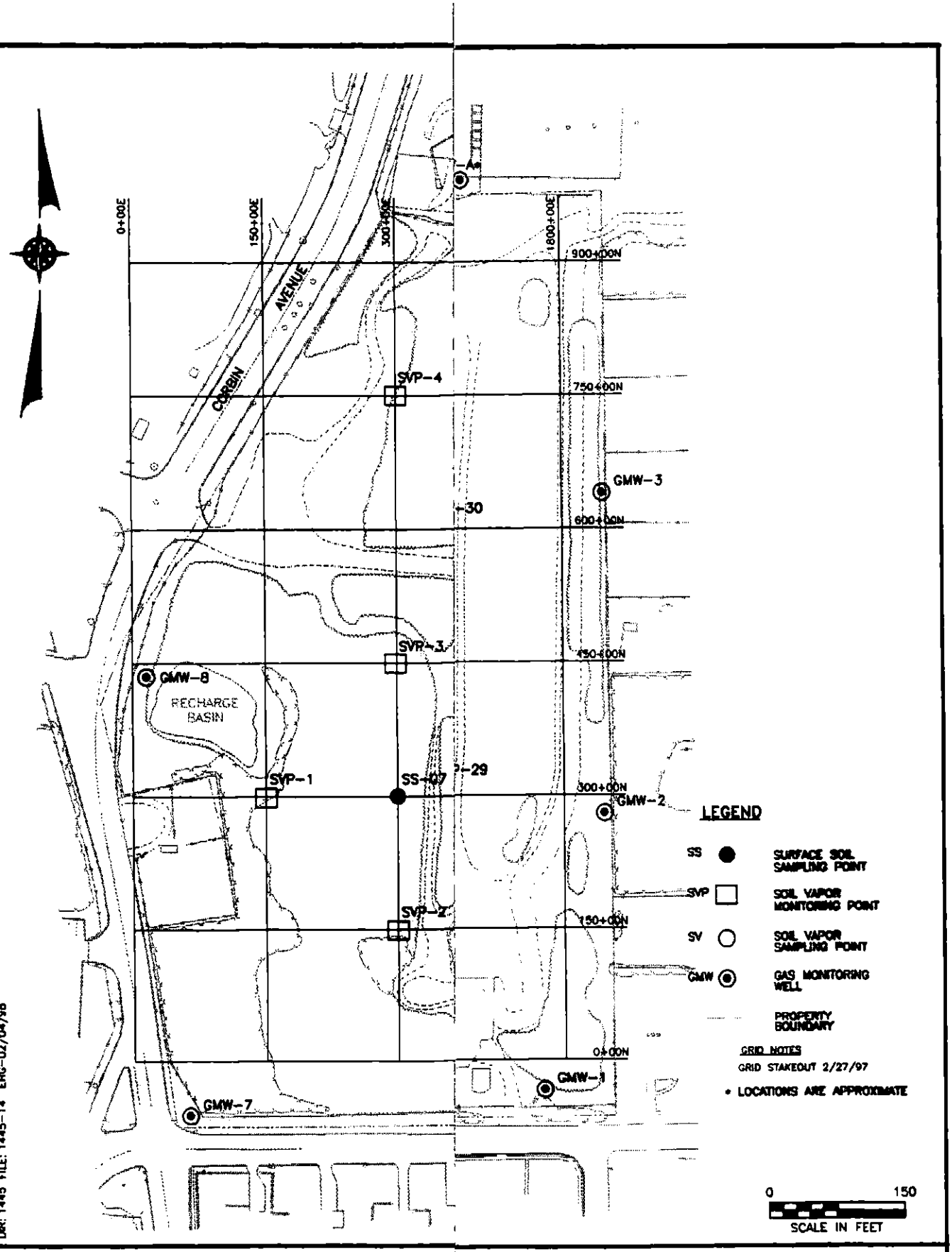
Due to historical data indicating elevated levels of methane in several perimeter gas monitoring wells on the landfill (see Figure 2-2), and the need to obtain current information on landfill gas emissions for on-site field activities and future landfill gas venting, a soil gas survey was conducted on-site to monitor for the presence of volatile organic compounds (VOCs) and explosive gas between March 4 and 6, 1997. Upon initial evaluation of the soil vapor screening results obtained between March 4 and 6, 1997, which detected elevated levels of explosive gas in



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FIGURE 2-1



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FIGURE 2-2

a number of areas of the landfill, a second round of soil vapor screening was performed by the Town on March 19, 1997.

According to the Town, the gas monitoring wells consist of 2-inch PVC casing and screen, and were installed to a total depth of 30 feet below ground surface (bgs) and screened from approximately 20 to 30 feet bgs. The Town monitored these wells periodically from September 1992 to September 1996, and the results are summarized in Section 4.2.1. The soil vapor/methane gas survey data will aid in design of the capping system and emission control system, if necessary.

Thirty soil vapor screening points (SVP-1 through SVP-30) were installed at grid node locations (see Figure 2-2) and screened for soil vapors. At each node point, a stainless steel probe was driven into the ground to a depth of 3 feet using a slide hammer. Soil vapor measurements were obtained from a depth of 3 feet to reduce the effect of surface contamination, changes in barometric pressure, temperature and precipitation. During the initial survey, total VOC and percent lower explosive limit (LEL) gas measurements were obtained with a photoionization detector (PID) and an EXOTOX multi-gas meter, respectively. During soil vapor measurements, site-specific information regarding temperature, wind direction, wind speed, barometric pressure and humidity were recorded. During the second survey, a PID and two explosive gas meters (an EXOTOX multi-gas meter and a Lantec ISC H5267 meter owned by the Town) were used to detect total VOCs, percent LEL, percent methane, percent carbon dioxide and hydrogen sulfide in parts per million (ppm). The results of the soil vapor/explosive gas survey are presented in Section 4.2.1.

Six soil vapor samples were collected from the probes on March 6, 1997, using a vacuum pump and sorbent tubes, and analyzed for VOCs in accordance with United States Environmental Protection Agency (USEPA) Method T01/T02. Since all of the initial PID measurements were zero, locations for soil vapor sample collection were based on providing broad aerial coverage of the landfill. Soil vapor sample SV-V-1 was collected at the SVP-9 soil vapor screening location; sample SV-V-2 from location SVP-7; sample SV-V-3 from location SVP-16; sample SV-V-4

from location SVP-28; sample SV-V-5 from location SVP-26; and sample SV-V-6 from location SVP-21 (see Figure 2-2). On May 28, 1997, sample location SVP-21 (sample SV-V-6) was resampled after the initial sample was lost at the laboratory. Sample Information Records are included in Appendix A. The analytical results of the soil vapor samples are presented in Section 4.2.1.

2.5 Surface Soil Sampling

To address concerns identified by the New York State Department of Health regarding potential surficial contamination, four surface soil samples (SS-S-4 [0-2"] through SS-S-7 [0-2"]) were collected on-site and three surface soil samples (SS-S-1 [0-2"] through SS-S-3 [0-2"]) were collected off-site on February 26 and 27, 1997. Figure 2-2 illustrates the on-site surface soil sample locations and Figure 2-5 shows the off-site sample locations. Two of the on-site samples (SS-S-4 [0-2"] and SS-S-5 [0-2"]) were collected in the vicinity of the former ballfields on the eastern portion of the site, and the other two samples (SS-S-6 [0-2"] and SS-S-7 [0-2"]) were collected on the western portion of the site. Of the three off-site surface soil samples collected, one sample (SS-S-1 [0-2"]) was collected to characterize the background surficial soil quality in the industrial area to the north of the site, and two samples (SS-S-2 [0-2"] and SS-S-3 [0-2"]) were collected to characterize the background surficial soil quality in the residential area to the south of the site. Sample Information Records and Location Sketches are included in Appendices A and B, respectively.

Each sample was collected from 0 to 2 inches below ground surface utilizing a dedicated, disposable polyethylene scoop. Each sample was analyzed for Target Compound List (TCL) +30 and Target Analyte List (TAL) parameters. The analytical results of the surface soil samples are discussed in Section 4.2.2.

2.6 Test Pit Construction

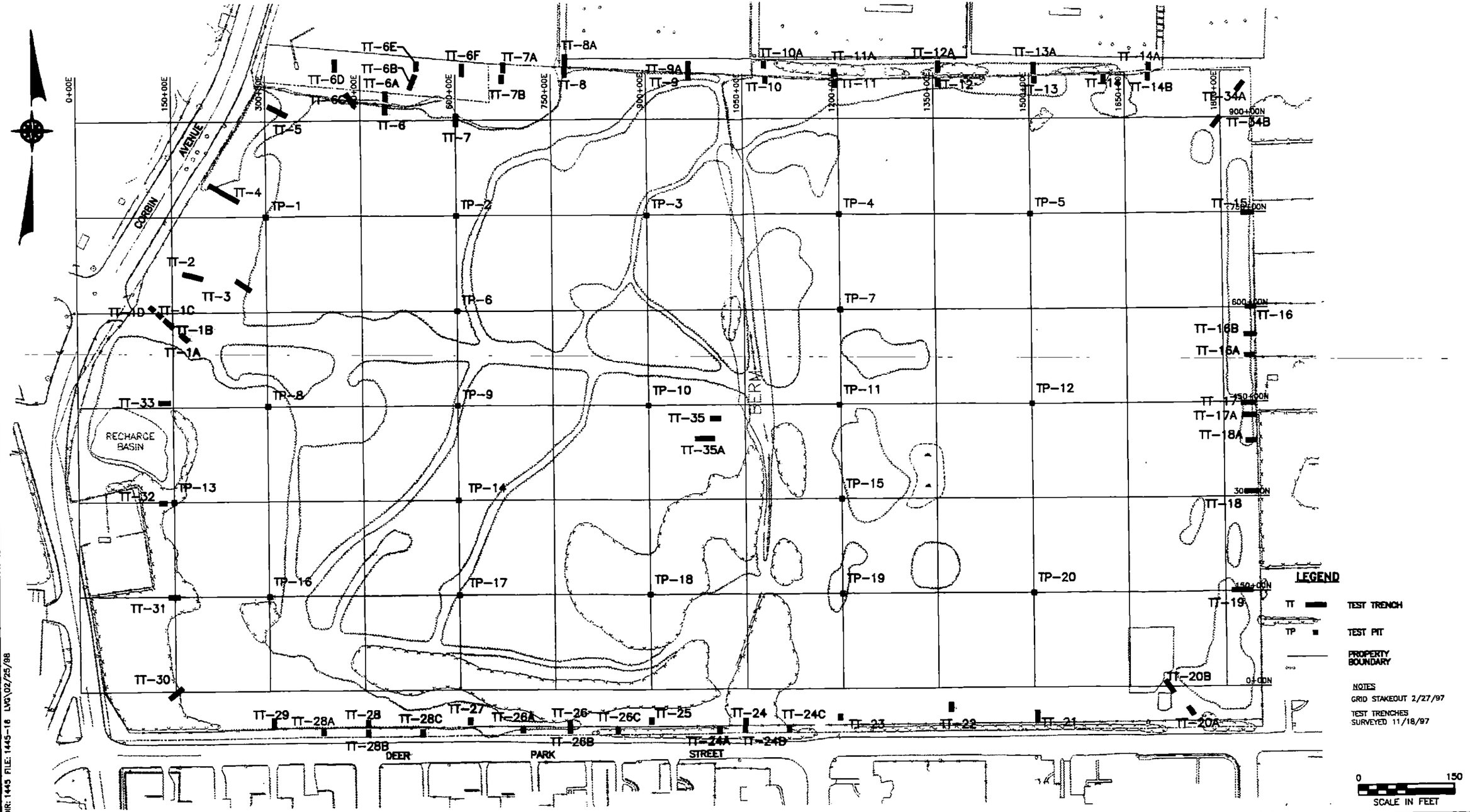
In order to provide information on the thickness of existing cover material, 20 test pits (TP-1 through TP-20) were constructed on-site (see Figure 2-3) between August 4 and 7, 1997. The test pits were constructed utilizing a Case 580E four-wheel drive backhoe with a bucket reach of approximately 18 feet. Observation of test pit construction was provided by a geologist. The entire backhoe was decontaminated upon arrival at and prior to departure from the Sonia Road Landfill, and not between use at each test pit location, since no samples were to be collected for chemical analysis.

The dimensions of the test pits were approximately 6 feet long, 6 feet wide and 6 feet deep. The test pits were logged for soil characteristics and waste contents, and recorded on Test Pit Logs and Test Pit Profiles, which are provided in Appendix C, and observations regarding color, odor and maximum PID/explosive gas measurements which were also recorded on the Test Pit Logs.

Air monitoring was performed during test pit excavation utilizing a PID and an explosive gas meter. Subsequent PID and explosive gas readings were measured up and downwind of the test pits to ensure that the ambient air did not exhibit elevated readings above background. All PID and explosive gas measurements were recorded on Air Monitoring Forms which are provided in Appendix D. The PID and explosive gas meters were calibrated daily, and calibration times and results are documented on Daily Equipment Calibration Logs which are provided in Appendix E. The results of the test pit program, including a discussion of soil cover thickness, is presented in Section 3.4.

2.7 Test Trench Construction

Between August 7 and 18, 1997, 39 test trenches were constructed at 34 locations (TT-1 through TT-34) approximately 150 feet apart around the perimeter of the landfill within the property boundary (see Figure 2-3). All of these trenches were constructed within the site fence



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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

TEST PIT AND TEST TRENCH LOCATIONS

FIGURE 2-3

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line. Where additional test trenches were constructed in the same general area, they were labeled TT-#A, B, C, etc. The objective of the test trenches was to determine the lateral extent and thickness of waste at the landfill perimeter.

On October 20 and 21, 1997, nine additional test trenches (TT-24A, 24B, 24C, TT-26A, 26B, 26C and TT-28A, 28B and 28C) were constructed outside the site fence on the southern portion of the site for additional waste delineation. On October 21 and 23, 1997, four additional test trenches (TT-16A, 16B, 17A and 18A) were constructed along the east side of the landfill, within the fence line for additional waste delineation. On October 24, 1997, one additional test trench (TT-6A) was constructed on the northwestern portion of the landfill, outside the fence, but, within the property boundary. All of the above test trenches were constructed utilizing the same backhoe used for construction of the test pits described in Section 2.6.

Between November 3 and 5, 1997, 11 additional test trenches (TT-6B, 6C, TT-7A, 7B, and TT-8A through 14A) were constructed outside the fence line and beyond the property boundary (except TT-6B, 6C, 7A and 7B) on the northern portion of the site for additional waste delineation. These test trenches were constructed with a Komatsu PC 3000 LC track-mounted excavator/backhoe with a bucket reach of over 25 feet. The backhoe was decontaminated upon arrival at and prior to departure from the site, and not between use at each test trench location.

On January 14, 1998, three additional test trenches (TT-6D, TT-6E and TT-6F) were constructed in the northwest corner of the Sonia Road Landfill to further define the limits of waste in this area. This area lies between the landfill's property boundary and the northern property boundary of the Town of Islip's "60-foot paper road" where soil and construction and demolition (C&D) debris piles resulting from a C&D processing facility north of the landfill have been covering a portion of the Town's property. At the time of these additional test trenches, the soil pile in the northwestern portion of the site was being removed by owner of the property north of the landfill. Test trench TT-6D was constructed at the base of the soil pile; however, at the time of test trench construction, the soil pile was still on Town property.

Test trenches TT-6D, TT-6E and TT-6F were constructed with a track-mounted excavator. These test trenches were excavated to approximately 13 feet below grade to native material or groundwater, whichever was encountered first.

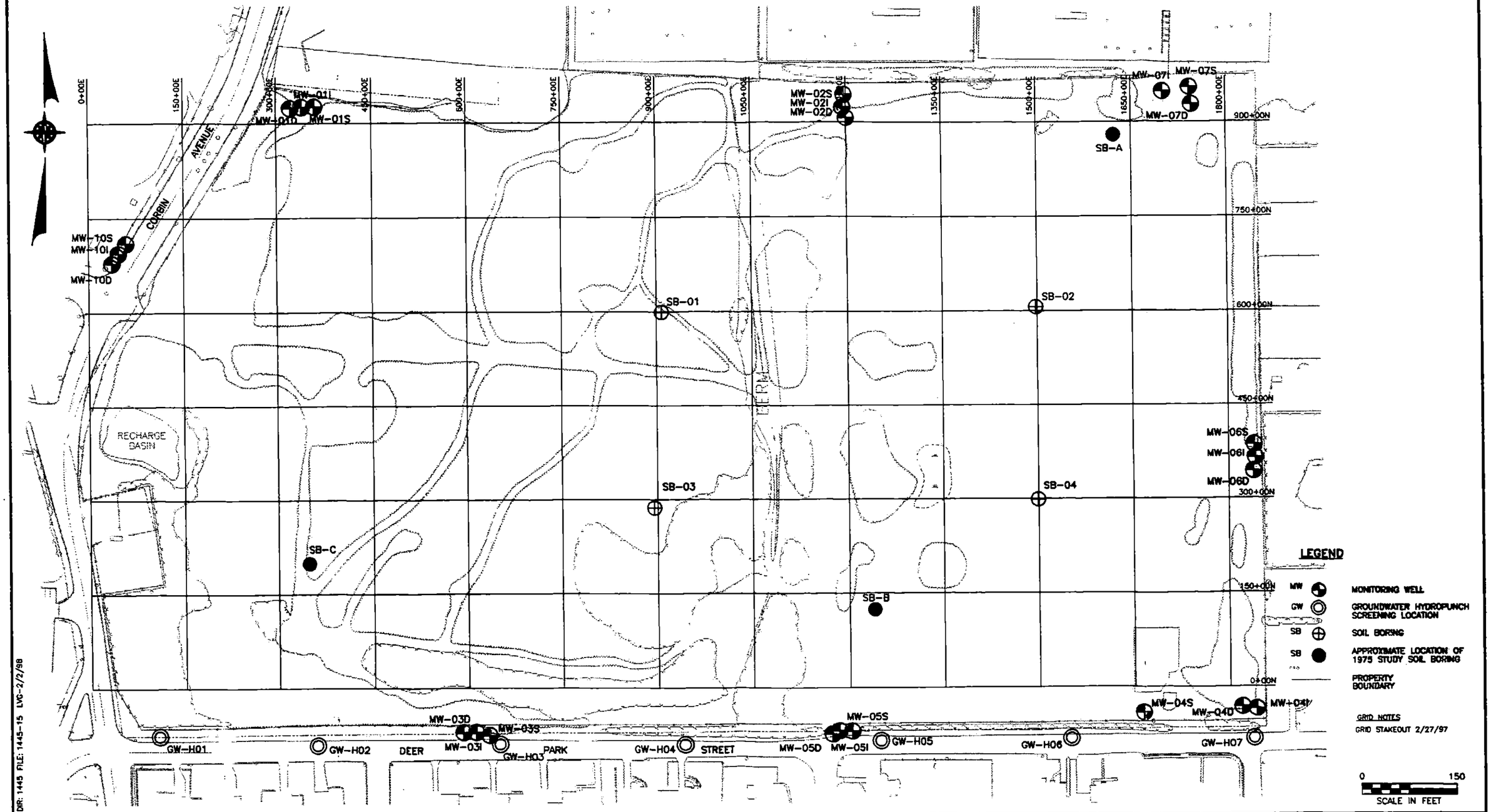
Test trenches were excavated typically to a depth of 10 feet and a width of 4-6 feet. Test trenches excavated by the larger track-mounted backhoe were constructed generally deeper (up to 20 feet below the ground surface). The length of the trenches varied, ranging from 10 feet to 55 feet. No samples were collected from these test trenches for chemical analysis. The trenches were logged for soil characteristics, waste content, observations regarding color and odor, and maximum PID/explosive gas measurements, and recorded on Test Trench Logs and Test Trench Profiles which are provided in Appendix F. Air monitoring was performed during the test trench program as described in Section 2.6. The results of the test trench program, including a discussion of waste delineation, is presented in Section 3.5.

2.8 Soil Boring, Hydropunch and Monitoring Well Program

2.8.1 Borehole Construction for On-Site Soil Borings

Two soil borings (SB-01 and SB-03) were constructed in the central portion of the landfill and two soil borings (SB-02 and SB-04) were constructed on the eastern portion of the landfill at 300-foot grid locations on August 1, August 4, August 5, August 15, and August 18 through August 21, 1997 (see Figure 2-4). The objective of the soil borings was to determine the thickness of waste in the landfill and depth below groundwater, and to characterize the waste at the water table and the soil below the waste.

The soil borings were constructed with 4 1/4-inch hollow stem augers (HSA). The total depths of the soil borings are as follows: SB-01 was constructed to 37 feet bgs, SB-02 to 42 feet bgs, SB-03 to 67 feet bgs and SB-04 to 46 feet bgs. Drill logs for the soil borings are contained in Appendix G. Soil boring results, including a discussion of the depth of waste and depth to groundwater, is presented in Section 4.2.3.



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SOIL BORING, HYDROPUNCH AND ON-SITE MONITORING WELL LOCATIONS

FIGURE 2-4

Two split spoon samples were collected at the water table interface and two split spoon samples were collected at the base of the borehole for waste and subsurface soil chemical characterization. One of the samples collected at the water table interface (SB-1-1 collected from 18-20 feet below ground surface [bgs]) was analyzed for TCL +30 and TAL parameters, and the other water table interface sample (SB-3-1 from 20-22 feet bgs) was analyzed for Toxicity Characteristic Leaching Procedure (TCLP) parameters. One of the samples collected from below the waste (SB-2-1 collected from 40-42 feet bgs) was analyzed for TCLP parameters and the other sample collected below the waste (SB-4-1 collected from 44-46 feet bgs) was analyzed for TCL +30 and TAL parameters. Sample Information Records are included in Appendix A. The results of these subsurface soil samples are presented in Section 4.2.3.

Samples obtained from the split spoons were observed and logged for physical/geologic characteristics, odors and staining, and screened with a PID. Drill logs for the soil borings are included in Appendix G. During soil boring construction, elevated levels of methane were typically encountered and methane suppressant was introduced down the borehole. The use of methane suppressant was successful in quickly lowering the methane levels to less than 1% LEL before continuing drilling. Continuous air monitoring was performed with a PID and an explosive gas meter, and the readings were recorded on Air Monitoring Forms which are included in Appendix D.

All drill cuttings resulting from construction of the soil borings were replaced into the borehole to the maximum extent possible and any remaining cuttings were disposed on-site in the designated area immediately north of the recharge basin in the western portion of the landfill.

2.8.2 Hydropunch Construction and Sampling

Seven Hydropunch screening points (GW-H01 through GW-H07) were installed immediately outside the southern property boundary along Deer Park Street at approximately 300-foot intervals (see Figure 2-4). Hydropunch screening points GW-H01 through GW-H07 were installed between August 22 and September 23, 1997. Nine groundwater samples were

collected from each screening point (except GW-H05 where ten groundwater samples were collected) for a total of 64 samples. Samples were collected every 10 feet beginning at the water table, which ranged from 20-23 feet bgs, and terminating close to or at the top of the Gardiners Clay, which ranged from 108 feet bgs at GW-H02 to 113 feet bgs at GW-H07.

The boring at Hydropunch screening point GW-H01 was constructed using 4 1/4-inch HSA. The shallow portion of the borings (from ground surface to approximately 60 feet bgs) at GW-H02 through GW-H07 were also constructed using 4 1/4-inch HSA. Due to difficulties in drilling deeper than approximately 60 feet bgs, a field change was made, and the remainder of the deeper Hydropunch screening points were constructed using 3 1/4-inch HSA. Split spoon samples were collected starting at approximately 100 feet bgs at 5-foot intervals to the Gardiners Clay; however, after the Gardiners Clay was encountered at depths shallower than expected, a field change was made and split spoon samples started at approximately 98 feet bgs and were collected continuously until the Gardiners Clay was encountered. Samples obtained from the split spoons were observed and logged for physical/geologic characteristics, odors and staining, and screened with a PID. Drill logs for the Hydropunch borings are included in Appendix H.

The Hydropunch boreholes were constructed using potable water obtained from nearby Suffolk County Water Authority hydrants (with prior approval by the Town) to the borehole during drilling to maintain a positive head inside the borehole and reduce running sands which were encountered in each borehole at varying amounts. The addition of water during drilling was approved by the NYSDEC Project Manager.

Discrete groundwater samples were collected with a Hydropunch sampler and the headspace of each sample was screened with a Photovac 10S Plus portable Gas Chromatograph (GC) in a designated area established at D&B's office. Each groundwater sample was screened for select volatile organic compounds based primarily on the results of the Geoprobe study conducted by NYSDEC in 1994, which is discussed in Section 1.5. These select VOCs included vinyl chloride, chloroethane, 1,1-dichloroethene, 1,1-dichloroethane, cis-1,2-dichloroethene and

trans-1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, benzene, chlorobenzene, and total xylenes.

The portable GC was calibrated to detect each of these selected (target) constituents. The portable GC was calibrated prior to each day's use. The results of the portable GC screening are presented in Section 4.2.7. Seven split samples (representing slightly greater than ten percent of the samples collected) were delivered to H2M Laboratory, Inc. for confirmatory TCL VOC analysis. These confirmatory samples are GW-H1-08 (collected at 93 feet bgs); GW-H2-03 (43 feet bgs); GW-H4-01 (26 feet bgs); GW-H4-07 (86 feet bgs); GW-H5-09 (106 feet bgs); GW-H6-05 (67 feet bgs); and GW-H7-03 (47 feet bgs). The results of the confirmatory analysis are discussed in Section 4.3. Sample Information Records for these groundwater samples are included in Appendix A.

Each groundwater sample was also measured for water quality, including pH, temperature, conductivity, dissolved oxygen and turbidity, utilizing portable equipment immediately after retrieval from the Hydropunch sampler. These water quality measurements are provided in Table 2-1. Based on the water quality and screening results, modifications were made to the monitoring well program as discussed below in Sections 2.8.3 and 2.8.7.

2.8.3 Borehole Construction for Monitoring Wells

Thirty-one groundwater monitoring wells were installed to complete twelve cluster locations (MW-01 through MW-07, and MW-10 through MW-14) during this investigation. Five monitoring wells preexisted on-site (MW-01S, MW-02S, MW-03S, MW-03I (formerly labeled MW-3D) and MW-04S. Figure 2-4 shows the locations of all newly installed and preexisting monitoring wells on-site and Figure 2-5 shows the locations of all wells on and off-site. Planned monitoring well cluster MW-08 was not installed, since the Hydropunch samples at this location (GW-H01) did not indicate significant groundwater contamination. Additionally, planned monitoring well cluster MW-09 was moved to the MW-01 cluster location after well MW-1S was located.

Table 2-1

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL GROUNDWATER (HYDROPUNCH)
WATER QUALITY MEASUREMENTS

Sample Depth (feet)	pH	Conductivity (mS/cm)	Temperature (°C)
Sample Location GW-H01			
23	5.16	0.598	18.7
33	5.87	0.286	17.8
43	5.91	0.341	18.1
53	6.1	0.104	19
63	4.52	0.097	20.1
73	5.65	0.225	19.7
83	5.23	0.209	19.7
93	5.81	0.210	19.2
103	6.92	0.094	20.4
Sample Location GW-H02			
23	6.1	--	--
33	6.82	0.193	23.2
43	6.62	0.464	18.9
53	6.76	0.099	19.9
63	6.9	0.138	18.8
73	6.48	0.110	18.3
83	6.63	0.220	17.3
93	7.55	0.083	17.6
103	--	--	--
Sample Location GW-H03			
25	6.58	0.501	22.1
35	6.87	0.561	21.3
45	6.82	0.556	20.1
55	6.77	0.538	18.6
64	6.79	0.496	19.8
75	5.78	0.185	18.9
85	7.7	0.112	19.9
95	6.73	0.138	18.8
105	6.87	0.146	19.5

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Table 2-1 (continued)

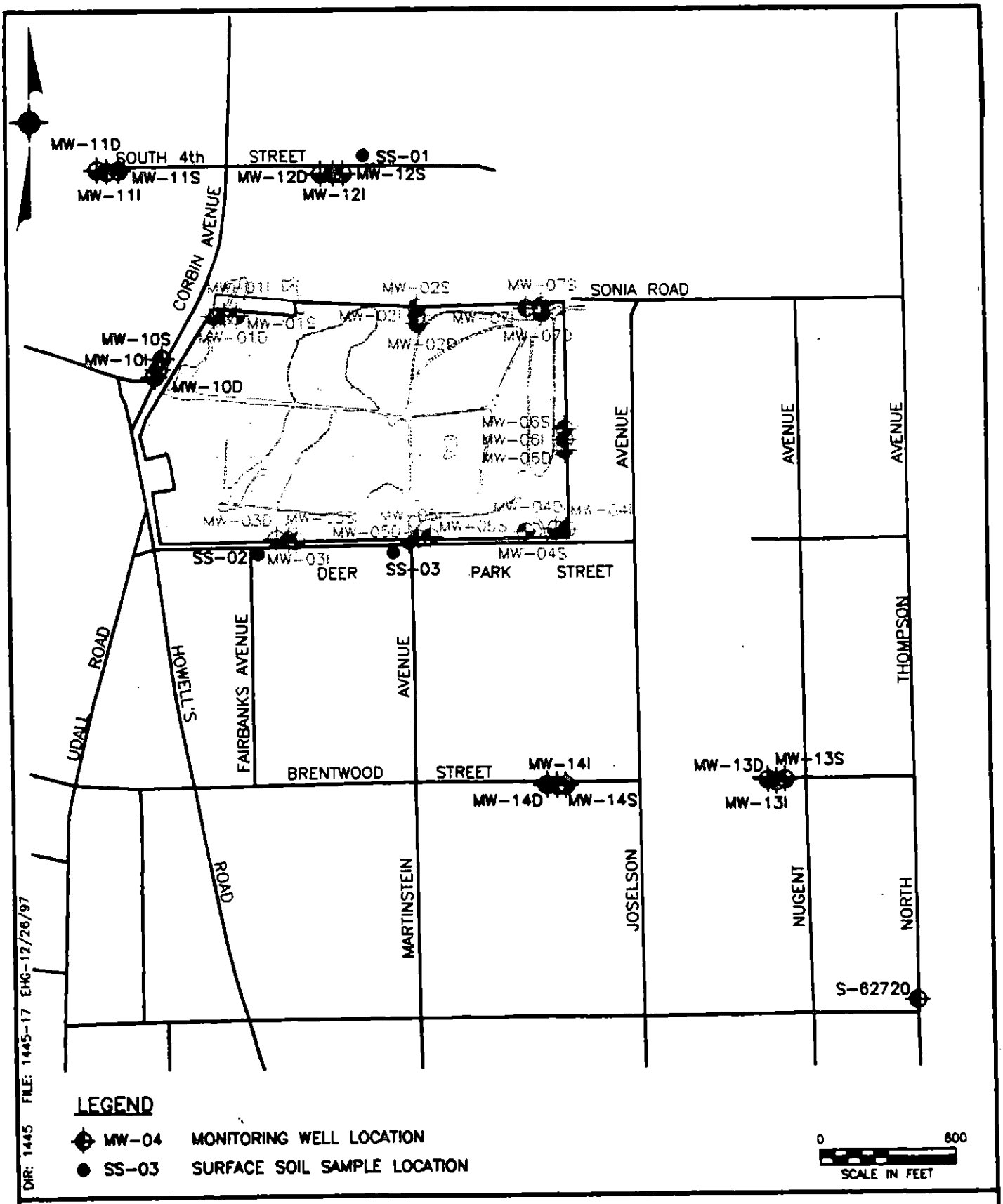
SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL GROUNDWATER (HYDROPUNCH)
WATER QUALITY MEASUREMENTS

Sample Depth (feet)	pH	Conductivity (mS/cm)	Temperature (°C)
Sample Location GW-H04			
26	6.39	0.980	19.2
36	6.53	0.741	18.5
46	6.79	0.605	19.9
56	6.74	0.476	17.6
66	6.53	0.352	17.5
76	6.56	0.192	18.4
86	6.69	0.176	19.2
96	6.75	0.215	18.6
104	6.61	0.097	18.6
Sample Location GW-H05			
27	6.45	1.230	11.9
37	6.53	0.715	16.2
47	6.7	0.646	17.5
57	6.55	1.000	17.3
67	6.61	0.150	20.6
77	6.82	0.170	21.2
87	6.36	0.277	17.7
97	6.88	0.145	18.2
106	7.09	0.073	19.8
Sample Location GW-H06			
27	6.28	1.480	16.4
37	6.23	1.350	15.1
47	6.36	1.430	16.1
57	6.39	1.420	15.9
67	5.6	0.308	14.3
77	6.23	0.497	14.9
87	6.61	0.660	15.8
97	6.39	0.433	16.8
104	6.29	0.281	18.3

Table 2-1 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL GROUNDWATER (HYDROPUNCH)
WATER QUALITY MEASUREMENTS

Sample Depth (feet)	pH	Conductivity (mS/cm)	Temperature (°C)
Sample Location GW-H07			
27	6.46	1.490	17.5
37	6.45	1.390	16.3
47	6.58	0.698	17.6
57	6.68	0.136	17.5
67	6.48	0.397	19.4
77	6.59	0.182	18.4
87	6.52	0.828	18.7
97	6.53	0.125	18.6
107	6.73	0.298	18.4



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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

OFF-SITE MONITORING WELL AND SURFACE SOIL SAMPLING LOCATIONS

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FIGURE 2-5

Monitoring wells were installed between September 24 and October 17, 1997. Each cluster includes one shallow, one intermediate and one deep well for a total of 36 wells. The shallow wells were installed at the water table and the depths of the well boreholes ranged from 20 feet bgs at MW-11S and MW-12S to 38 feet bgs at MW-13S depending on the depth to groundwater. The intermediate wells were installed to approximately 70 feet bgs and the deep wells were installed at the upper surface of the Gardiners Clay (which represents the base of the Upper Glacial aquifer). The total depths of the deep well boreholes ranged from 96 feet bgs at MW-11D to 130 feet bgs at MW-07D depending on the depth to the Gardiners Clay. The depths of the well boreholes are discussed in Section 2.8.8.

The deep monitoring well boreholes were drilled using 6 5/8-inch HSA. However, due to difficulties in drilling as a result of running sands, a field change was made to drill each of these boreholes first using smaller 3 1/4-inch HSA for split spoon sampling, followed by the use of 6 5/8-inch HSA for the subsequent well installations. The use of 3 1/4-inch HSA was approved by the Town, and in order to obtain additional geologic data, gamma logging was conducted for all remaining deep wells. As part of this change, the Town waived split spoon sampling performed at five-foot intervals from the water table and allowed the split spoon sampling to commence at approximately 100 feet bgs, and continuously thereafter to the Gardiners Clay. All shallow and intermediate well boreholes were drilled with 6 5/8-inch HSA as originally planned.

Potable water was added to the hollow stem augers to maintain a positive hydrostatic head reducing the amount of running sands in the augers. The use of 3 1/4-inch HSA reduced the amount of drill cuttings and water needed to maintain the hydrostatic head in the augers.

All drill cuttings resulting from the construction of the well boreholes were disposed in the designated area on-site, directly north of the recharge basin.

2.8.4 Monitoring Well Borehole Soil Sampling

Split spoon samples were collected every 5 feet in the saturated zone in the deep wells installed at each cluster down to the Gardiners Clay. However, based on the varying depth to the Gardiners Clay at each location, and based on changes approved by the Town (use of smaller 3 1/4-inch augers and gamma logging), split spoon samples were collected continuously, typically starting at approximately 98 feet bgs; however, as shallow as 94 feet bgs where ground surface elevations were lower. Each sample was screened with a PID. No split spoon samples were collected for chemical analysis.

2.8.5 Borehole and Monitoring Well Geologic Logging

All deep boreholes and monitoring wells were logged and documented by a geologist. Notes were kept in both bound field books and on Drill Logs (contained in Appendix I) and Well Construction Logs (contained in Appendix J). The Modified Burmeister Classification System was used in the field to describe the samples recovered from the borings. The soil descriptions were based on the equivalent soil descriptions according to the Unified Soil Classification System entered into the GIS/Key database as discussed in Sections 3.2 and 3.3.

2.8.6 Borehole and Monitoring Well Gamma Logging

As part of the change to use 3 1/4-inch HSA, all deep boreholes or deep monitoring wells were gamma logged for lithologic information in lieu of collecting split spoon samples at 5-foot intervals as per the Work Plan. Gamma logging was performed using a 2PGA-1000 Poly-Gamma probe for the deep boreholes. Gamma logging was conducted in the PVC and stainless steel casings of monitoring wells MW-03D and MW-06D, since these wells had been installed prior to the Work Plan change. Copies of the gamma logs are contained in Appendix K.

2.8.7 Monitoring Well Locations

Thirty-one groundwater monitoring wells were installed at twelve cluster locations during the remedial investigation to monitor upgradient, on-site and downgradient groundwater quality (see Figure 2-4 for on-site monitoring well locations and Figure 2-5 for off-site well locations).

Thirty-five wells were proposed; however, based on the Hydropunch/screening results at GW-H01, which indicated very little contamination at this location, MW-08 cluster wells were not installed (this omitted three wells from the proposed Work Plan). The last well omitted was MW-01S, since it was located and determined to be usable. Monitoring well cluster MW-09 was proposed; however, this cluster was moved and completed as the MW-01 cluster location. Monitoring wells MW-04I and MW-04D were moved 160 feet to the east of existing monitoring well MW-04S, and within close proximity to Hydropunch GW-H07, based on the Hydropunch/screening results at this location. Other modifications to the monitoring well program are documented in a letter provided by D&B to the NYSDEC dated September 24, 1997, contained in Appendix L.

The on-site monitoring wells (monitoring well clusters MW-01 through MW-07) were installed along the perimeter of the landfill (see Figure 2-4) to aid in providing on-site groundwater quality information.

Off-site monitoring well locations include MW-10 through MW-14 (see Figure 2-5). One upgradient monitoring well cluster (MW-10) was installed immediately to the west of the site across Corbin Avenue to better define upgradient groundwater quality and other sources of contamination to the northwest of the site, since the earlier NYSDEC Geoprobe investigation indicated the highest level of VOCs at the southwestern edge of the landfill. Two additional upgradient monitoring well clusters (MW-11 and MW-12) were installed to better define upgradient groundwater quality north of the landfill, since groundwater contamination was previously identified in the industrial park north of the landfill. In order to define downgradient groundwater quality, two monitoring well clusters (MW-13 and MW-14) were installed south and southeast of the landfill (see Figure 2-5).

2.8.8 Monitoring Well Installation and Construction

Upon completion of drilling and sampling each borehole, a groundwater monitoring well was installed. To be consistent with the preexisting on-site monitoring wells, the wells installed as part of this investigation were constructed with 4-inch diameter, flush joint, schedule 40 PVC riser pipe and 10-slot (0.010-inch) stainless steel, wire wrapped screens. A 15-foot screen was installed in each of the shallow wells to allow for fluctuation in the water table (approximately 5 feet of the screen was placed above the water table and the remaining 10 feet below the water table). The total depths of the shallow wells, which were screened at the water table, ranged from 19 feet at MW-11S and MW-12S to 37 feet at MW-13S depending on the depth to groundwater. A 10-foot screen was installed in each intermediate and deep well. The total depths of the intermediate wells, which were selected in part to intercept the deep portion of the leachate plume emanating from the landfill based on the Hydropunch results, ranged from 69 to 71 feet bgs. The total depths of the deep monitoring wells, which were screened just above the Gardiners Clay, ranged from 94 feet at MW-11D to 119 feet at MW-07D and MW-13D depending on the depth to the Gardiners Clay.

A clean Number 1 Grade sand pack was tremied around the well screen to a depth of 2 feet above the top of the screen and 6 inches below the bottom of the screen. A finer Number 00 Grade sand pack was tremied around the well screen above the Grade 1 sand pack to a minimum thickness of 6 inches. A bentonite slurry (PUREGOLD grout) was pumped above the finer sand pack around the well screen by the tremie method. PVC well caps with keyed-alike locks were used for securing the well casings. A 9-inch diameter flush mount protective well vault was cemented at the ground surface to complete the well construction. Table 2-2 summarizes the monitoring well construction details. Well Construction Logs for the deep wells are included in Appendix J.

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
MW-01D	99.00	100.00	57.06	56.71	4.00	89.00-99.00	Wire-Wrap	0.00-0.00	Backfill
							SCH 5 Type 304	2.00-86.50	Seal
								86.50-87.00	Filter
								87.00-99.50	Filter
MW-01I	70.00	70.50	57.57	57.25	4.00	60.00-70.00	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-57.50	Seal
								57.50-58.00	Filter
								58.00-70.50	Filter
MW-01S	21.00	21.00	57.74	57.36	4.00	1.00-11.00	Slotted	0.00-2.00	Backfill
							SCH 40 PVC	2.00-9.00	Seal
								9.00-21.00	Filter
MW-02D	114.30	115.50	76.97	76.63	4.00	104.30-114.30	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-101.50	Seal
								101.50-102.00	Filter
								102.00-115.00	Filter
MW-02I	70.00	70.50	76.83	76.35	4.00	60.00-70.00	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-57.50	Seal
								57.50-58.00	Filter
								58.00-70.50	Filter
MW-02S	42.00	42.00	76.94	76.32	4.00	32.00-42.00	Slotted	1.00-27.00	Backfill
							SCH 40 PVC	27.00-30.00	Seal
								30.00-42.00	Filter

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
MW-03D	106.70	107.50	70.71	70.50	4.00	96.70-106.70	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-93.00	Seal
								93.00-94.00	Filter
								94.00-107.50	Filter
MW-03I	84.00	84.00	70.77	70.51	4.00	79.00-84.00	Slotted	1.00-70.00	Backfill
							SCH 40 PVC	70.00-76.00	Seal
								76.00-84.00	Filter
MW-03S	32.00	34.00	70.76	70.49	4.00	22.00-32.00	Slotted	1.00-17.00	Backfill
							SCH 40 PVC	17.00-20.00	Seal
								20.00-32.00	Filter
MW-04D	113.20	116.00	68.20	67.90	4.00	103.20-113.20	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-100.00	Seal
								100.00-101.00	Filter
								101.00-114.00	Filter
MW-04I	70.10	70.50	68.44	68.06	4.00	60.10-70.10	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-70.50	Filter
MW-04S	32.00	33.00	69.56	69.18	4.00	0.00-32.00	Slotted	1.00-17.00	Backfill
							SCH 40 PVC	17.00-20.00	Seal
								20.00-32.00	Filter
MW-05D	116.00	117.00	71.14	71.04	4.00	106.00-116.00	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-103.50	Seal

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
MW-05D (cont.)								103.50-104.00	Filter
								104.00-116.50	Filter
MW-05I	70.40	71.00	70.71	70.55	4.00	60.40-70.40	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-71.00	Filter
MW-05S	33.60	34.00	70.78	70.58	4.00	18.60-33.60	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-15.00	Seal
								15.00-16.00	Filter
								16.00-34.00	Filter
MW-06D	111.80	112.50	69.90	69.65	4.00	101.80-111.80	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-98.00	Seal
								98.00-99.00	Filter
								99.00-112.50	Filter
MW-06I	71.00	71.50	69.55	69.21	4.00	61.00-71.00	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-58.00	Seal
								58.00-59.00	Filter
								59.00-71.50	Filter
MW-06S	32.35	33.60	69.52	69.06	4.00	17.35-32.35	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-15.00	Seal
								15.00-15.50	Filter
								15.50-33.00	Filter

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
MW-07D	118.80	130.00	72.35	72.16	4.00	108.80-118.80	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-106.00	Seal
								106.00-107.00	Filter
								107.00-119.50	Filter
MW-07I	70.15	71.50	69.48	69.25	4.00	60.15-70.15	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-71.00	Filter
MW-07S	32.75	34.00	72.26	71.72	4.00	17.75-32.75	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-15.00	Seal
								15.00-16.00	Filter
								16.00-33.50	Filter
MW-10D	96.20	98.00	56.83	56.34	4.00	86.20-96.20	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-83.00	Seal
								83.00-84.00	Filter
								84.00-97.00	Filter
MW-10I	69.50	70.00	56.74	56.16	4.00	59.50-69.50	Wire-Wrap SCH 5 Type 304	0.00-2.00	Backfill
								2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-70.00	Filter
MW-10S	18.95	19.50	56.82	56.65	4.00	3.95-18.95	Wire-Wrap SCH 5 Type 304	0.00-1.00	Backfill
								1.00-2.00	Seal
								2.00-2.50	Filter
								2.50-19.50	Filter

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
MW-11D	93.20	96.00	59.35	59.03	4.00	83.20-93.20	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-80.50	Seal
								80.50-81.50	Filter
								81.50-94.00	Filter
MW-11I	69.65	70.50	59.26	58.85	4.00	59.65-69.65	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-70.50	Filter
MW-11S	18.90	19.50	59.57	59.24	4.00	3.90-18.90	Wire-Wrap	0.00-1.00	Backfill
							SCH 5 Type 304	1.00-2.00	Seal
								2.00-19.50	Filter
MW-12D	98.20	100.00	59.00	58.68	4.00	88.20-98.20	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-85.00	Seal
								85.00-86.00	Filter
								86.00-99.00	Filter
MW-12I	69.90	70.50	59.16	58.95	4.00	59.90-69.90	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-70.50	Filter
MW-12S	18.85	19.50	59.07	58.81	4.00	3.85-18.85	Wire-Wrap	0.00-1.00	Backfill
							SCH 5 Type 304	1.00-2.00	Seal
								2.00-19.50	Filter

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
MW-13D	119.00	122.00	70.59	70.35	4.00	109.00-119.00	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-106.00	Seal
								106.00-107.00	Filter
								107.00-119.50	Filter
MW-13I	70.80	71.50	70.49	70.29	4.00	60.80-70.80	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-57.00	Seal
								57.00-58.00	Filter
								58.00-71.50	Filter
MW-13S	36.80	37.50	70.57	70.50	4.00	21.80-36.80	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-19.00	Seal
								19.00-20.00	Filter
								20.00-37.50	Filter
MW-14D	104.50	106.00	64.91	64.59	4.00	94.50-104.50	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-92.00	Seal
								92.00-93.00	Filter
								93.00-105.00	Filter
MW-14I	71.35	72.00	64.81	64.58	4.00	61.35-71.35	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-58.00	Seal
								58.00-59.00	Filter
								59.00-72.00	Filter
MW-14S	30.30	31.00	64.71	64.55	4.00	15.30-30.30	Wire-Wrap	0.00-2.00	Backfill
							SCH 5 Type 304	2.00-12.50	Seal
								12.50-13.50	Filter
								13.50-31.00	Filter

Table 2-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF WELL CONSTRUCTION DETAILS

SITE	WELL DEPTH (feet bgs)	TOTAL DEPTH (feet bgs)	GROUND SURFACE ELEVATION (feet)	MP ELEVATION (feet)	CASING DIAMETER (inches)	SCREENS (feet bgs)		ANNULAR FILLS (feet bgs)	
						INTERVAL	DESCRIPTION	INTERVAL	TYPE
S-62720	80.00	80.00	67.32	67.19	2.00	75.00-80.00	Slotted STEEL		

2.8.9 Monitoring Well Development

The monitoring wells installed as part of the remedial investigation were developed by pumping and surging to remove sediment from the well and assure the wells were in hydraulic connection with the surrounding formation. The pre-existing wells (MW-01S, MW-02S, MW-03S, MW-03I, and MW-04S) were also developed by the pumping and surging method. These wells were developed during this investigation since no record of initial well development exists. All wells were developed between September 9 and 23, 1997. A 4-inch diameter submersible pump with polyethylene tubing was used to develop the monitoring wells. The pump and tubing were decontaminated prior to and between use in each well by steam cleaning (including the inside of the tubing) followed by pumping approximately 10 gallons of potable water through the pump and tubing.

Water quality measurements, including pH, conductivity, temperature, dissolved oxygen and turbidity were collected at regular intervals during development. Well development continued until the turbidity values were below 50 Nephelometric Turbidity Units (NTUs) and the water quality measurements stabilized for three consecutive readings within 10% variation or less. Natural turbidities were relatively high in some of the wells (slightly below 50 NTUs) Final turbidities, as well as other water quality measurements for the wells, are provided in Table 2-3.

All development water was pumped directly into a water tank truck and disposed in the recharge basin on-site as approved by the Town and NYSDEC.

2.8.10 Groundwater Level Measurements

Groundwater level measurements were obtained from the 31 newly installed wells, the five pre-existing wells and also from an existing SCDHS downgradient well (S-62720) on November 4 and 18, 1997. Each round of water levels was collected within an 8-hour period. The static water levels were measured to the nearest hundredth (0.01) foot with a decontaminated electronic water level indicator. All static water levels were obtained from the top of the PVC

Table 2-3

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL MONITORING WELL DEVELOPMENT
WATER QUALITY MEASUREMENTS

Monitoring Well No.	pH	Conductivity (eV)	Dissolved Oxygen (mg/l)	Temperature (°C)	Turbidity (NTUs)
MW-01S	6.85	0.709	6.62	16.1	30.1
MW-01I	5.31	0.646	3.37	13.5	3.3
MW-01D	5.37	0.604	4.83	13.0	38.4
MW-02S	6.20	0.224	5.92	13.4	8.2
MW-02I	4.56	0.126	2.89	13.5	4.1
MW-02D	4.71	0.083	5.91	13.3	2.8
MW-03S	6.33	0.525	3.81	15.0	16.8
MW-03I	6.46	0.148	3.55	13.6	13.1
MW-03D	6.55	0.168	--	14.9	38.4
MW-04S	6.41	1.37	3.42	14.6	32.0
MW-04I	6.33	1.11	1.16	15.5	3.3
MW-04D	6.48	0.641	3.79	15.5	8.8
MW-05S	6.60	0.109	11.04	15.4	17.5
MW-05I	6.59	0.152	11.25	14.8	21.8
MW-05D	6.30	0.630	4.52	13.6	14.2
MW-06S	6.38	1.04	3.81	15.4	22.3
MW-06I	6.21	0.305	2.19	15.0	5.6
MW-06D	6.35	0.129	5.89	13.1	18.6

Table 2-3 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL MONITORING WELL DEVELOPMENT
WATER QUALITY MEASUREMENTS

Monitoring Well No.	pH	Conductivity (eV)	Dissolved Oxygen (mg/l)	Temperature (°C)	Turbidity (NTUs)
MW-07S	6.72	0.235	4.02	15.0	4.0
MW-07I	6.02	0.112	2.59	13.9	13.1
MW-07D	6.54	0.080	1.06	13.4	44.0
MW-10S	6.70	0.667	3.64	16.3	3.9
MW-10I	6.84	0.726	6.50	14.3	3.4
MW-10D	5.90	4.83	6.85	13.7	5.2
MW-11S	6.31	0.522	1.98	18.3	21.1
MW-11I	6.41	0.195	6.29	13.9	4.4
MW-11D	5.70	0.102	7.12	12.9	44.9
MW-12S	6.31	0.296	5.32	16.8	6.0
MW-12I	6.01	0.184	5.28	13.9	12.2
MW-12D	6.10	0.116	7.04	13.6	19.0
MW-13S	5.21	0.108	6.33	15.7	40.2
MW-13I	5.36	0.408	5.36	13.2	30.3
MW-13D	6.32	0.526	6.58	12.6	36.0
MW-14S	5.16	0.137	6.21	15.4	49.4
MW-14I	5.28	0.545	4.75	13.5	17.2
MW-14D	6.39	0.640	5.57	13.4	21.8

well casing (a surveyed reference point). The water level meter was decontaminated between use in each well. Table 2-4 presents the results of the two rounds of static water levels measurements.

2.8.11 Groundwater Sampling

Two rounds of groundwater samples were collected from a total of 36 monitoring wells (31 new and 5 existing); the first round between September 23 and November 3, 1997, and the second round between January 28 and February 3, 1998. The wells sampled were the on-site MW-01 through MW-07 cluster wells, and the off-site MW-10 through MW-14 cluster wells.

The wells were purged until a minimum of three to five well volumes were removed. The number of well volumes purged was a function of the stabilization of the pH, temperature, conductivity, dissolved oxygen and turbidity readings. These measurements are contained in the project field log books. Final water quality measurements are provided in Table 2-5. A 3-inch submersible pump and disposable tubing was used to purge each well. The pump was decontaminated prior to and between use in each well by manually scrubbing with a solution of potable water/alconox detergent, followed by pumping approximately 10 gallons of potable water/alconox detergent through the pump. Subsequently, an additional 10 gallons of potable water was pumped through the system followed by rinsing the pump with distilled water.

Once the well was sufficiently purged, groundwater samples were collected with disposable polyethylene bailers and disposable polypropylene rope. Samples collected during the first round were analyzed for TCL +30 and TAL parameters and leachate parameters as listed in the Part 360 Expanded Parameters List, and samples collected during the second round were analyzed for TCL VOCs only, which were identified as the contaminants of concern based on the initial results.

During the first round of sampling, turbidity levels greater than 50 NTUs were measured at wells MW-04D, MW-06S, MW-06I, MW-11S, MW-11D and MW-14D after completion of purging (and gently introducing the bailers into each well). Due to elevated levels of turbidity

TABLE 2-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WATER LEVEL MEASUREMENTS
NOVEMBER 4 AND 18, 1997

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	△ WATER ELEV.(1) (feet)	WATER ELEV. (feet)
MW-01D	11/04/97	56.710	00:00	7.29	NA	49.42
MW-01D	11/18/97	56.710	00:00	7.18	0.11	49.53
MW-01I	11/04/97	57.250	00:00	7.82	NA	49.43
MW-01I	11/18/97	57.250	00:00	7.73	0.09	49.52
MW-01S	11/04/97	57.360	00:00	7.96	NA	49.40
MW-01S	11/18/97	57.360	00:00	7.85	0.11	49.51
MW-02D	11/04/97	76.630	00:00	28.36	NA	48.27
MW-02D	11/18/97	76.630	00:00	28.21	0.15	48.42
MW-02I	11/04/97	76.350	00:00	28.05	NA	48.30
MW-02I	11/18/97	76.350	00:00	27.92	0.13	48.43
MW-02S	11/04/97	76.320	00:00	28.03	NA	48.29
MW-02S	11/18/97	76.320	00:00	27.88	0.15	48.44
MW-03D	11/04/97	70.500	00:00	23.35	NA	47.15
MW-03D	11/18/97	70.500	00:00	23.20	0.15	47.30
MW-03I	11/04/97	70.510	00:00	23.39	NA	47.12
MW-03I	11/18/97	70.510	00:00	23.23	0.16	47.28
MW-03S	11/04/97	70.490	00:00	23.39	NA	47.10
MW-03S	11/18/97	70.490	00:00	23.24	0.15	47.25
MW-04D	11/04/97	67.900	00:00	22.11	NA	45.79
MW-04D	11/18/97	67.900	00:00	21.96	0.15	45.94
MW-04I	11/04/97	68.060	00:00	22.30	NA	45.76
MW-04I	11/18/97	68.060	00:00	22.15	0.15	45.91
MW-04S	11/04/97	69.180	00:00	23.25	NA	45.93
MW-04S	11/18/97	69.180	00:00	23.11	0.14	46.07

(1) Change in Water Elevation since last reported measurement

D = Dry NA = Not Available

2)Measurements Based on MSL MP ELEVATION = CASING ELEVATION

Time of water level measurement was not recorded

TABLE 2-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WATER LEVEL MEASUREMENTS
NOVEMBER 4 AND 18, 1997

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	△ WATER ELEV.(1) (feet)	WATER ELEV. (feet)
MW-05D	11/04/97	71.040	00:00	24.68	NA	46.36
MW-05D	11/18/97	71.040	00:00	24.51	0.17	46.53
MW-05I	11/04/97	70.550	00:00	24.16	NA	46.39
MW-05I	11/18/97	70.550	00:00	24.00	0.16	46.55
MW-05S	11/04/97	70.580	00:00	24.22	NA	46.36
MW-05S	11/18/97	70.580	00:00	24.07	0.15	46.51
MW-06D	11/04/97	69.650	00:00	23.24	NA	46.41
MW-06D	11/18/97	69.650	00:00	23.08	0.16	46.57
MW-06I	11/04/97	69.210	00:00	22.82	NA	46.39
MW-06I	11/18/97	69.210	00:00	22.65	0.17	46.56
MW-06S	11/04/97	69.060	00:00	22.64	NA	46.42
MW-06S	11/18/97	69.060	00:00	22.48	0.16	46.58
MW-07D	11/04/97	72.160	00:00	24.73	NA	47.43
MW-07D	11/18/97	72.160	00:00	24.57	0.16	47.59
MW-07I	11/04/97	69.250	00:00	21.78	NA	47.47
MW-07I	11/18/97	69.250	00:00	21.63	0.15	47.62
MW-07S	11/04/97	71.720	00:00	24.22	NA	47.50
MW-07S	11/18/97	71.720	00:00	24.08	0.14	47.64
MW-10D	11/04/97	56.340	00:00	7.06	NA	49.28
MW-10D	11/18/97	56.340	00:00	6.93	0.13	49.41
MW-10I	11/04/97	56.160	00:00	6.75	NA	49.41
MW-10I	11/18/97	56.160	00:00	6.65	0.10	49.51
MW-10S	11/04/97	56.650	00:00	7.22	NA	49.43
MW-10S	11/18/97	56.650	00:00	7.15	0.07	49.50

(1) Change in Water Elevation since last reported measurement D = Dry NA = Not Available

2)Measurements Based on MSL MP ELEVATION = CASING ELEVATION

Time of water level measurement was not recorded

TABLE 2-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WATER LEVEL MEASUREMENTS
NOVEMBER 4 AND 18, 1997

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	△ WATER ELEV.(1) (feet)	WATER ELEV. (feet)
MW-11D	11/04/97	59.030	00:00	7.72	NA	51.31
MW-11D	11/18/97	59.030	00:00	7.65	0.07	51.38
MW-11I	11/04/97	58.850	00:00	7.56	NA	51.29
MW-11I	11/18/97	58.850	00:00	7.51	0.05	51.34
MW-11S	11/04/97	59.240	00:00	7.93	NA	51.31
MW-11S	11/18/97	59.240	00:00	7.89	0.04	51.35
MW-12D	11/04/97	58.680	00:00	8.81	NA	49.87
MW-12D	11/18/97	58.680	00:00	8.71	0.10	49.97
MW-12I	11/04/97	58.950	00:00	9.11	NA	49.84
MW-12I	11/18/97	58.950	00:00	9.02	0.09	49.93
MW-12S	11/04/97	58.810	00:00	8.97	NA	49.84
MW-12S	11/18/97	58.810	00:00	8.89	0.08	49.92
MW-13D	11/04/97	70.350	00:00	27.69	NA	42.66
MW-13D	11/18/97	70.350	00:00	27.67	0.02	42.68
MW-13I	11/04/97	70.290	00:00	27.63	NA	42.66
MW-13I	11/18/97	70.290	00:00	27.61	0.02	42.68
MW-13S	11/04/97	70.500	00:00	27.84	NA	42.66
MW-13S	11/18/97	70.500	00:00	27.82	0.02	42.68
MW-14D	11/04/97	64.590	00:00	20.84	NA	43.75
MW-14D	11/18/97	64.590	00:00	20.74	0.10	43.85
MW-14I	11/04/97	64.580	00:00	20.89	NA	43.69
MW-14I	11/18/97	64.580	00:00	20.80	0.09	43.78
MW-14S	11/04/97	64.550	00:00	20.85	NA	43.70
MW-14S	11/18/97	64.550	00:00	20.76	0.09	43.79

(1) Change in Water Elevation since last reported measurement D = Dry NA = Not Available

2)Measurements Based on MSL MP ELEVATION = CASING ELEVATION

Time of water level measurement was not recorded

TABLE 2-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WATER LEVEL MEASUREMENTS
NOVEMBER 4 AND 18, 1997

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	△ WATER ELEV.(1) (feet)	WATER ELEV. (feet)
S-62720	11/04/97	67.190	00:00	26.75	NA	40.44
S-62720	11/18/97	67.190	00:00	26.79	-0.04	40.40

(1) Change in Water Elevation since last reported measurement

D = Dry NA = Not Available

2)Measurements Based on MSL MP ELEVATION = CASING ELEVATION

Time of water level measurement was not recorded

Table 2-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL GROUNDWATER (MONITORING WELL)
WATER QUALITY MEASUREMENTS

Monitoring Well No.	pH	Conductivity (eV)	Dissolved Oxygen (mg/l)	Temperature (°C)	Turbidity (NTUs)
MW-01S	6.69	0.565	4.24	15.2	26
MW-01I	5.73	0.627	2.34	14.3	13
MW-01D	5.89	0.610	3.36	13.8	16
MW-02S	6.33	0.237	3.21	13.5	24
MW-02I	8.96	0.128	2.20	13.5	28
MW-02D	6.07	0.081	6.87	13.4	14
MW-03S	6.47	0.524	3.31	14.5	13.1
MW-03I	6.59	0.151	4.32	14.1	6
MW-03D	6.62	0.168	3.79	14.0	41
MW-04S	6.12	1.42	2.22	13.9	24
MW-04I	6.21	1.12	3.92	14.0	7
MW-04D	6.73	0.661	4.29	13.6	16
MW-05S	6.77	0.109	1.86	14.6	8
MW-05I	6.29	0.159	2.21	13.7	11
MW-05D	6.38	0.676	5.07	14.0	3
MW-06S	6.45	1.09	3.36	13.3	29
MW-06I	6.61	0.290	2.79	13.9	29
MW-06D	6.78	0.129	6.22	13.8	46

Table 2-5 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FINAL MONITORING WELL DEVELOPMENT
WATER QUALITY MEASUREMENTS

Monitoring Well No.	pH	Conductivity (eV)	Dissolved Oxygen (mg/l)	Temperature (°C)	Turbidity (NTUs)
MW-07S	6.53	0.232	5.06	15.7	22
MW-07I	6.09	0.112	2.06	13.6	33
MW-07D	6.54	0.083	6.74	13.4	37
MW-10S	6.91	0.623	2.32	16.1	32
MW-10I	6.19	0.712	2.01	13.9	8
MW-10D	6.28	4.68	7.12	14.1	7
MW-11S	6.74	0.465	0.95	17.0	42
MW-11I	6.18	0.188	0.00	15.8	22
MW-11D	6.03	0.112	8.11	13.7	6
MW-12S	6.45	0.297	2.53	16.5	4
MW-12I	5.51	0.188	1.75	14.6	9
MW-12D	6.29	0.109	6.72	14.4	8
MW-13S	5.24	0.104	7.60	13.0	3
MW-13I	6.45	0.410	6.20	13.2	10
MW-13D	6.48	0.526	1.92	12.8	6
MW-14S	5.45	0.135	6.50	14.4	22
MW-14I	6.56	0.599	6.27	13.4	31
MW-14D	6.52	0.633	1.88	14.5	14

above 50 NTUs, samples for metals analysis were collected after the standing water in these wells was allowed to rest for a few hours before the metals samples were collected (until the turbidity reading was less than 50 NTUs). Sample Information Records for the groundwater samples are included in Appendix A. The groundwater sampling results are discussed in Section 4.2.5.

All groundwater samples were stored on ice in laboratory supplied coolers immediately after collection. Trip blanks accompanied all laboratory sample coolers in which the VOC samples were placed. Seven trip blank samples were analyzed for TCL VOCs. Chain of custody forms were completed prior to each delivery and accompanied each shipment. The chain of custody forms are contained in Appendix M.

All purge water was contained in a tank truck, and transported and disposed in the designated recharge basin on-site.

2.9 Supplemental Soil Investigation

As a result of an area of stressed vegetation with the presence of a black, tar-like substance being identified during the field survey performed as part of the habitat-based assessment for the Sonia Road Landfill (see Figure 3-13), a supplemental soil investigation of this area was conducted on January 14, 1998. This investigation involved the construction of two test trenches, TT-35 and TT-35A. The location of these test trenches are shown in Figure 2-3.

Two areas adjacent to one another were identified as being void of vegetation. Test trench TT-35 was constructed through the stressed vegetation area which measured approximately 150 square feet. Test trench TT-35A was constructed through an adjacent stressed vegetation area which measured approximately 600 square feet.

In both locations, the surface soil (0-2") consisted of black sand with a trace tar-like substance on the surface. Both test trenches were excavated to 2 feet below grade. Municipal solid waste was encountered beneath the thin layer of the black soil and trace tar-like substance.

Soil samples were collected at test trenches TT-35 and TT-35A from 0-2 inches and 1-2 feet below grade. The samples were analyzed for TCL +30 organic compounds, TAL metals and cyanide. Appropriate QA/QC samples were collected. The samples were stored on ice and transported in a cooler to the laboratory for analysis for one-week turnaround in order to be incorporated into the remedial investigation report.

Upon completion of the test trenches, the bucket of the excavator was steam cleaned and the decontamination pad removed from the site. The results of the sample analyses are presented in Section 4.0.

2.10 Private/Public Water Supply Well Survey

A private and public water supply well survey was conducted in the vicinity of the Sonia Road Landfill to determine if there are any potential receptors that could be impacted by groundwater contamination that may be migrating from or across the landfill. A map showing the landfill site and surrounding area which were surveyed is presented on Figure 2-6.

The survey was conducted in three parts: 1) identification of public water supply wells located within a 2-mile radius of the site; 2) identification of residences and commercial/ industrial facilities located with 1/2 mile upgradient and 1 1/2 miles downgradient of the site that are not currently provided with public water service and could be utilizing private water supply wells; and 3) identification of commercial/industrial and irrigation wells located within a 1-mile radius of the site.

Provided below are the results of this survey.

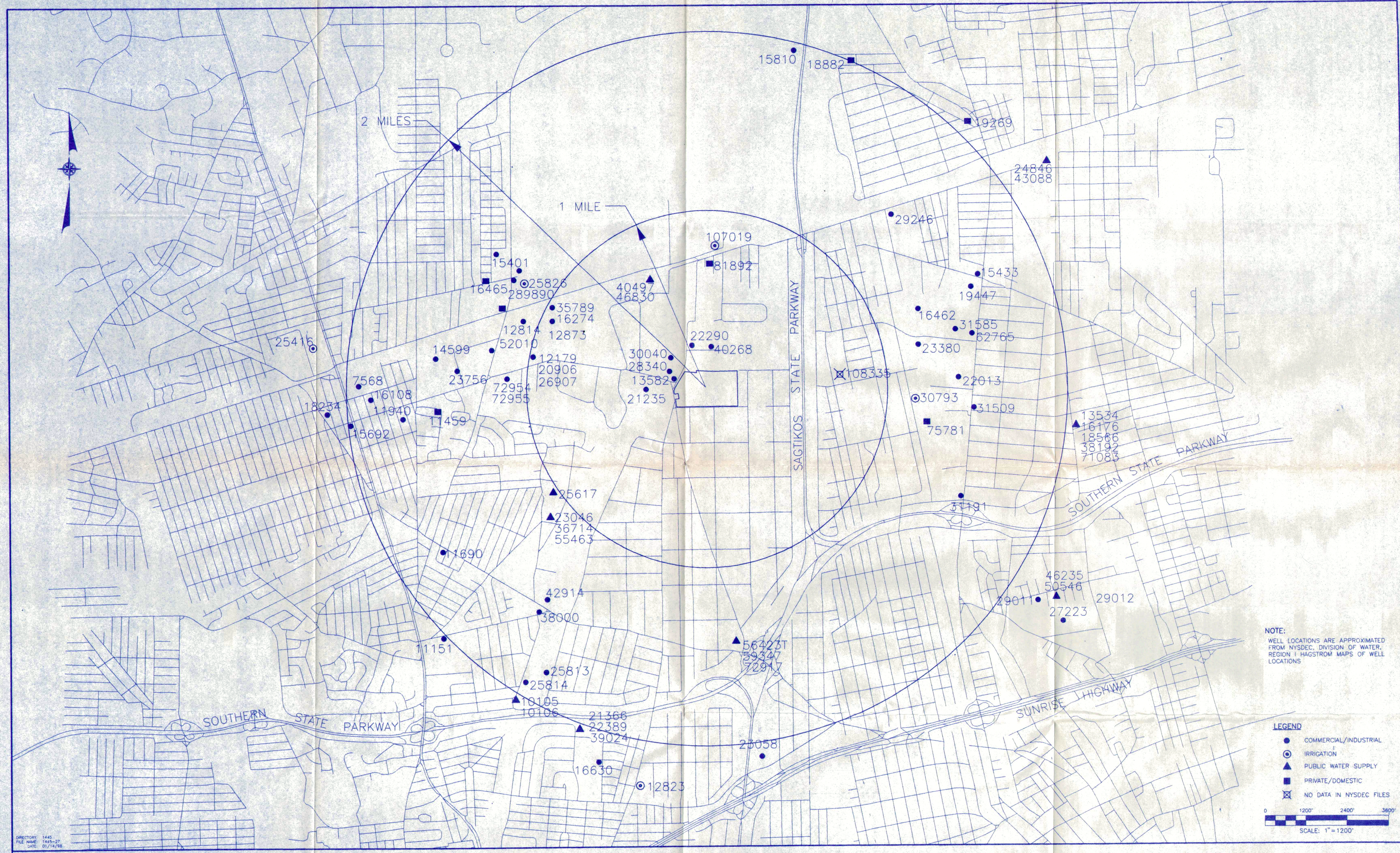
2.10.1 Public Water Supply Wells

The Sonia Road Landfill is located within the Suffolk County Water Authority (SCWA) service area. Information was obtained from the New York State Department of Environmental Conservation (NYSDEC), Suffolk County Department of Health Services (SCDHS) and SCWA to identify public water supply wells located within a 2-mile radius of the site. Figure 2-6 depicts the location of all public water supply wells within this radius. The operational status of the wells was provided by SCWA. A summary of the public water supply well information, including pumping capacity and ownership, is provided in Table 2-6. The public water supply wells which are located potentially downgradient of the Sonia Road Landfill are identified in Table 2-6 and Figure 2-6. The locations of these wells, as well as the industrial/commercial and irrigation wells shown on Figure 2-6 are approximate.

2.10.2 Private Water Supply Wells

Information on all residences and commercial/industrial facilities serviced by the SCWA was obtained. This information was used to conduct a survey to determine if residences and commercial/industrial facilities within the area of interest (1/2 mile upgradient and 1 1/2 miles downgradient of the site) are currently using public water and who may be serviced by private wells.

A Geographic Information System (GIS) coverage was obtained from the Town of Islip identifying all properties located within the area of interest. The GIS coverage included both a map depicting the location of each parcel and a database which included identifying information related to each parcel. The database fields included district, section, block, lot, property address, owner name, owner address and property classification code. The combination of district, section, block and lot provide a unique identifier for each parcel. The property classification codes contained in the database are based on the New York State Office or Real Property Services Assessors' Manuals Property Classification Codes. These codes are used to describe the primary use of each parcel of real property on an assessment roll.



NOTE:
WELL LOCATIONS ARE APPROXIMATED FROM NYSDEC, DIVISION OF WATER, REGION 1 HAGSTROM MAPS OF WELL LOCATIONS

LEGEND
- COMMERCIAL/INDUSTRIAL
- IRRIGATION
- PUBLIC WATER SUPPLY
- PRIVATE/DOMESTIC
- NO DATA IN NYSDEC FILES

0 1200' 2400' 3600'
SCALE: 1" = 1200'

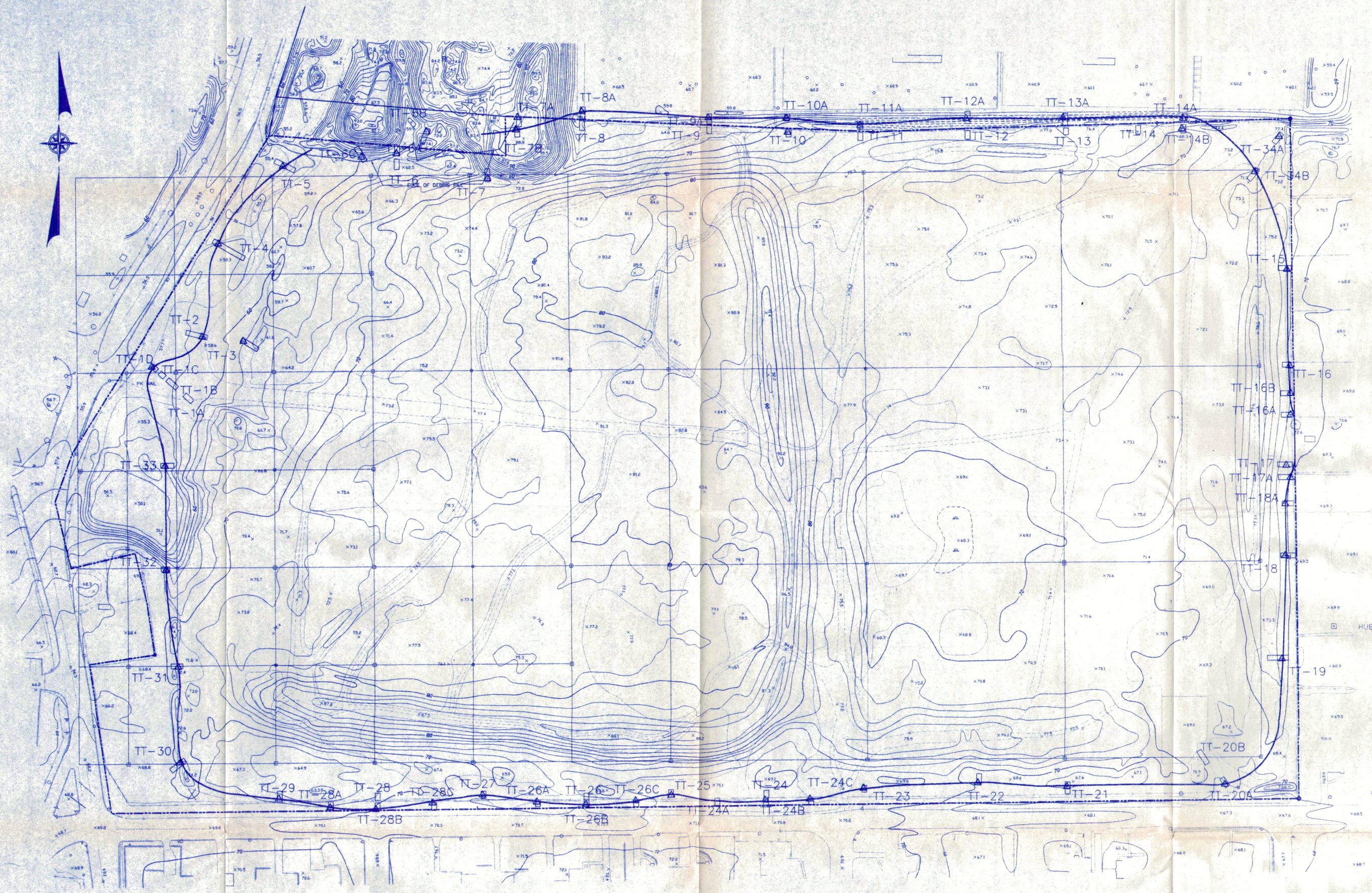
DIRECTORY: 1445
FILE NAME: 1445-27
DATE: 01/14/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

PRIVATE/PUBLIC WATER SUPPLY WELL SURVEY

FIGURE 2-6

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS
A DIVISION OF F. COSULICH ASSOCIATES, P.C.



LEGEND:

- LIMIT OF WASTE
- TEST TRENCH LOCATION
- SURVEYED LIMIT OF WASTE
- PROPERTY BOUNDARY

NOTES

GRID STAKEOUT 2/27/97

TEST TRENCHES SURVEYED 11/18/97

0 80' 160' 240'

SCALE: 1"=80'

DIRECTORY: 1445
FILE NAME: 1445-32
DATE: 01/28/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

WASTE DELINEATION MAP

FIGURE 3-12

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS
A DIVISION OF F. COSULICH ASSOCIATES, P.C.

Table 2-6

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PUBLIC WATER SUPPLY WELLS WITHIN 2 MILES OF SONIA ROAD LANDFILL

Well	Type	Depth	Pump Capacity	Owner	Wellfield	Status
10105	Public Supply	59	240	Deer Lake Water Co.	--	Inactive*
10106	Public Supply	59	240	Deer Lake Water Co.	--	Inactive*
13534	Public Supply	126	900	SCWA	East Forks Road	Inactive
16176	Public Supply	117	1000	SCWA	East Forks Road	Inactive
18566	Public Supply	383	1000	SCWA	East Forks Road	Inactive
23166	Public Supply	457	1500	SCWA	Harvest Lane	Inactive
22389	Public Supply	466	1200	SCWA	Harvest Lane	Active
23046	Public Supply	488	1200	SCWA	Brook Avenue	Inactive
23445	Public Supply	610	1200	SCWA	Emjay Avenue	Active
23617	Public Supply	440	1200	SCWA	Brook Avenue	Active
31104	Public Supply	658	1500	SCWA	Emjay Avenue	Active
36714	Public Supply	308	1200	SCWA	Brook Avenue	Active
38192	Public Supply	306	1200	SCWA	East Forks Road	Active
39024	Public Supply	622	1000	SCWA	Harvest Lane	Active
40497	Public Supply	284	1200	SCWA	Industry Court	Active
46235	Public Supply	713	1400	SCWA	Thomas Avenue	Active
46830	Public Supply	655	1200	SCWA	Industry Court	Active
50546	Public Supply	668	1400	SCWA	Thomas Avenue	Active
55463	Public Supply	363	1200	SCWA	Brook Avenue	Active
57008	Public Supply	635	1400	SCWA	Emjay Avenue	Active
59347	Public Supply	463	1400	SCWA	Bay Shore Road	Active
71083	Public Supply	801	1319 (test)	SCWA	East Forks Road	Active
72917	Public Supply	465	1300	SCWA	Bay Shore Road	Active

Notes:

SCWA: Suffolk County Water Authority
Depth is feet below grade.
*According to NYSDEC, well was probably abandoned prior to 1986.
Pump capacity is gallons per minute.
Test: Capacity determined during pump test.

The real property database provided by the Town of Islip was combined with a database of properties in the Town of Babylon located within the area of interest. Of particular interest is the industrial area north and northwest of the landfill. This combined database comprises a complete listing of over 1,200 properties located within the area of interest with the exception of public streets and highways, railroads and utility rights of way.

A listing of commercial and residential properties with public water service was obtained from the SCWA. This listing was provided as two separate databases. The first database contained over 1,600 records for properties within the area of interest serviced by the SCWA. The SCWA GIS database fields include SCWA account number, district, section, block, lot and property address. The second database, which is from the SCWA accounting system, contained over 3,500 records of SCWA customers organized by street address for those streets that fall either wholly or partly within the area of interest. The database fields included SCWA account number, owner name and address. Since SCWA databases include unique account identifiers used for billing purposes, and there were a considerable number of records common to both, the two databases were merged based on the SCWA account number to form a single database consisting of over 3,800 residential and commercial/industrial properties in the vicinity of the landfill that receive public water.

The combined SCWA database was compared to the combined property database to identify and eliminate those properties within the area of interest that receive public water. The comparison was performed first by district, section, block and lot number and then by street address. The resulting database consisted of over 100 properties that could not be positively identified as receiving public water.

A review of the property classification codes was performed on the remaining records to eliminate recorded vacant parcels of land. A total of 31 properties remained that require verification as to whether they are in fact not vacant and whether they receive public water or utilize a private well. Of the 31 properties identified above, the Town has confirmed that two

Brentwood School District #12 addresses (Middle School and Joselson Avenue School) are serviced by the SCWA under accounts SWA977-49010-1 (2030 Udall Road) and SWA977-502-009-1 (1095 Joselson Avenue). In addition, the Town identified that two properties are vacant industrial parcels and one property is a vacant residential parcel. In addition, the Town identified one residential parcel as containing an abandoned house. The remaining properties are provided in Table 2-7 and the locations illustrated on Figure 2-7. Based on this information, there does not appear to be any properties/potential receptors located downgradient of the Sonia Road Landfill which could be impacted if private wells are utilized, except for the property with the abandoned house (No. 12) should it be reoccupied.

2.10.3 Domestic, Industrial/Commercial and Irrigation Wells

Information was also obtained from the SCWA, SCDHS and NYSDEC to determine the locations of any domestic, industrial/commercial or irrigation wells within a 1-mile radius of the site. The Town confirmed that there is no record of industrial/commercial well 12136 listed as under ownership of Brentwood School District #12, which was identified in the initial survey. Figure 2-6 depicts the locations of these wells in the vicinity of the site which were obtained from these sources of information. The information obtained for the wells is summarized in Table 2-8. The wells which are located downgradient of the landfill are highlighted in Table 2-8 and on Figure 2-6.

2.11 Air Monitoring

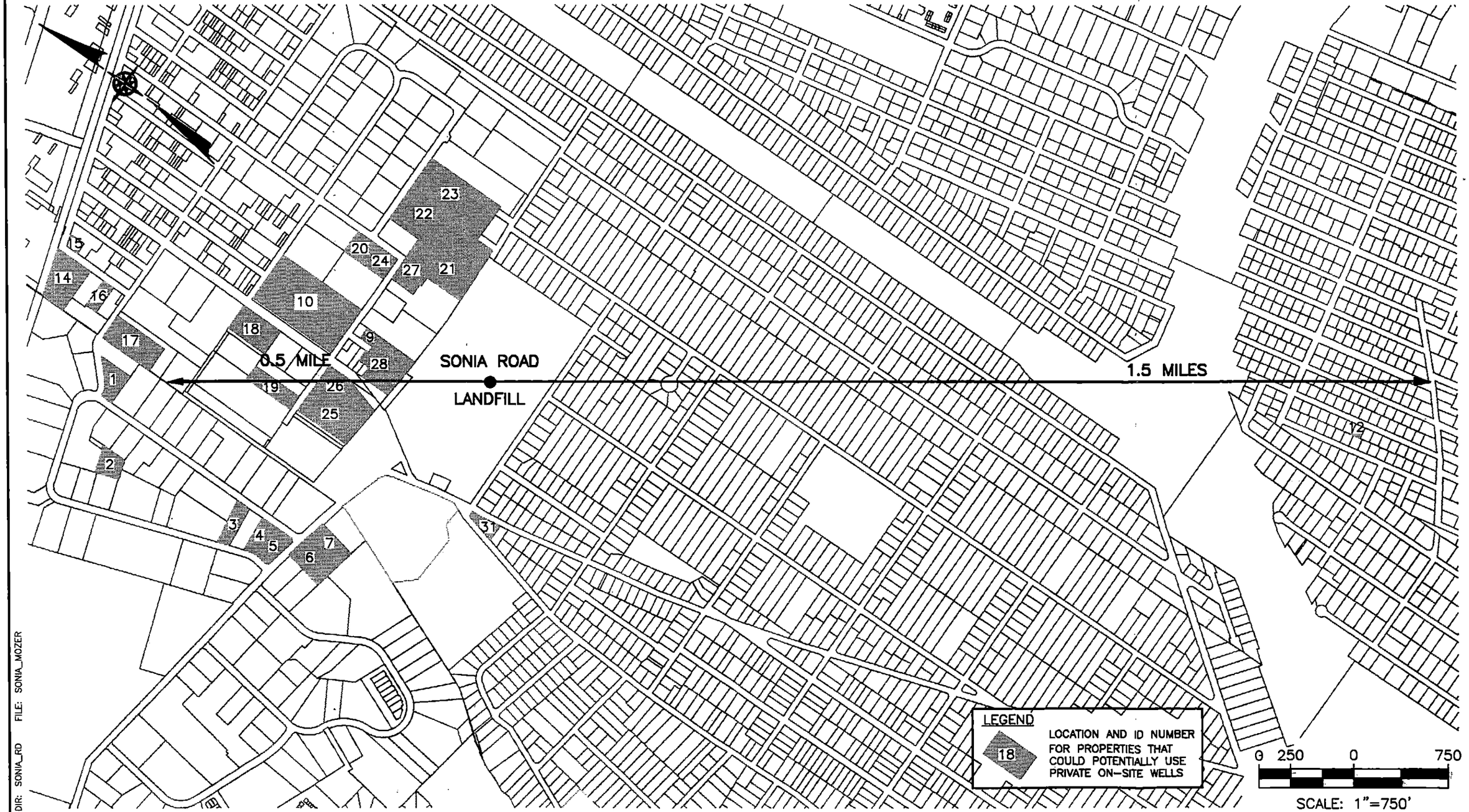
Ambient air monitoring was performed throughout the remedial investigation field program. Air monitoring was performed with a portable Photovac Microtip PID to detect total organic vapors in the work area, as well as up and downwind, at all sampling locations. A portable Neotronics EXOTOX multi-gas meter was also used to measure explosive gas levels, and a portable Miniram digital dust indicator was utilized to detect levels of respirable dust particulates in the air.

Air monitoring was performed during the field investigation to establish ambient air conditions and for protection of the workers' health and safety, and to collect information regarding

Table 2-7

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PROPERTIES IN THE VICINITY OF THE LANDFILL
POTENTIALLY UTILIZING PRIVATE WELLS

Site No.	District	Section	Block	Lot	Owner	Address	Land Use	Category
1	0100	068.00	0100	016.001	LUCON ASSOCIATES IN	10 SAXWOOD ST	710	Manufacturing and Processing
2	0100	068.00	0100	036.000	TOWN OF BABYLON	INDUSTRY CT	N/A	Not Available
3	0100	068.00	0100	026.002	INDUSTRY OFFICE ASSOCIATES C/O BROCK & YAVERS	60 E INDUSTRY CT	464	Office Building
4	0100	068.00	0100	026.005	BURTSON REALTY	20 E INDUSTRY CT	710	Manufacturing and Processing
5	0100	068.00	0100	026.006	BURTSON REALTY	1007-1013 GRAND BLVD	710	Manufacturing and Processing
6	0100	067.00	0100	025.003	FOUR L REALTY CORP	1014 GRAND BLVD	710	Manufacturing and Processing
7	0100	067.00	0100	026.000	GREAT AMERICAN REALTY OF DEER PARK CORP	1016 GRAND BLVD	710	Manufacturing and Processing
9	0500	198.00	0600	013.000	JOSEPH MARELLIA	GRANT AVE	270	Mobile Home
10	0500	198.00	0300	002.000	NAZZARENO F MONTALBINE	85 S FOURTH ST	700	Industrial
/12	0500	288.00	0200	074.000	PHILLIS SUDEROV-52	1432 ACKERSON BLVD	N/A	Not Available
13	0500	221.00	0100	042.000	JOYCE FLEMING & LYNN OWEN C/O GETTY PETROLEUM	2 DEER PARK ST	432	Service and Gas Stations
14	0500	179.00	0200	008.001	SANTO J RUISI	10 DUNTON AVE	N/A	Not Available
15	0500	179.00	0200	009.000	N BAY SHORE REALTY CO LTD	670 PINE AIRE DR	700	Industrial
16	0500	179.00	0200	005.000	EDWARD PICCOLA JR & ORS	30 DUNTON AVE	710	Manufacturing and Processing
17	0500	179.00	0200	003.010	SCIENTIFIC COMPONENTS CORP	S SECOND ST	N/A	Not Available
18	0500	198.00	0200	006.004	SYNERGY GAS CORP	185 CORBIN AVE	442	Bottled Gas, Natural Gas Facilities
19	0500	198.00	0200	004.000	ISLIP BUSINESS CORP	145 FOURTH ST	700	Industrial
20	0500	198.00	0400	004.003	BIAGIO CIARDULLO	90 CLEVELAND AVE	449	Other Storage, Warehouse and Distribution Facilities
21	0500	198.00	0700	011.028	HOLLOW PROPERTIES INC	220 SKIP LA	447	Trucking Terminals
22	0500	198.00	0700	011.026	HOLLOW PROPERTIES INC	240 SKIP LA	447	Trucking Terminals
23	0500	198.00	0700	011.027	HOLLOW PROPERTIES INC	270 SKIP LA	447	Trucking Terminals
24	0500	198.00	0400	004.004	BIAGIO CIARDULLO	CLEVELAND AVE	484	One Story Small Structure
25	0500	198.00	0500	002.000	Z & P REALTY OF L I INC	FIRE ROAD RD	710	Manufacturing and Processing
26	0500	198.00	0500	003.000	Z & P REALTY OF L I INC	CORBIN AVE	449	Other Storage, Warehouse and Distribution Facilities
27	0500	198.00	0700	011.024	HOLLOW PROPERTIES INC	140 S FOURTH ST	447	Trucking Terminals
28	0500	198.00	0600	012.001	GIAQUINTO MASONRY INC & AUGUSIEWICZ EXCAVATING CO	CORBIN AVE	710	Manufacturing and Processing



SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

RESIDENTIAL WELL SURVEY

FIGURE 2-7

Table 2-8

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
DOMESTIC, INDUSTRIAL/COMMERCIAL AND IRRIGATION
WELLS WITHIN 1 MILE OF SONIA ROAD LANDFILL

Well	Type	Depth	Pump Capacity	Owner
81892	Domestic	100	15	J.J. Mazzaro
12179	Ind./Comm.	41	40-50	Skyline Products
12873	Ind./Comm.	120	1000	Fairchild Eng. and Airplane Co.
13582	Ind./Comm.	44	41	Zara Asphalt Co.
16274	Ind./Comm.	63	200	REEO Park Realty Co.
20906	Ind./Comm.	110	600	Airborne Instrument Laboratory
20907	Ind./Comm.	110	600	Airborne Instrument Laboratory
21049	Ind./Comm.	60	200	Clearview Concrete Pipe Corp.
21235	Ind./Comm.	65	40	Garsite Products, Inc.
22290	Ind./Comm.	56.5	45	Roman Sand & Gravel Co.
28340	Ind./Comm.	80	40	Park Asphalt Corp.
30040	Ind./Comm.	52	25	Clearview Concrete Pipe Corp.
35789	Ind./Comm.	70	20	I.S. Hershwin
40268	Ind./Comm.	95	250	Certified Industries
107019	Irrigation	95	400	Heartland Golf Association

Notes:

Ind./Comm.: Industrial/Commercial.
Depth is feet below grade.
Pump capacity is gallons per minute.

the presence of organic vapors at the point of sample collection. Although total organic and explosive gas levels above background (defined as 0% LEL for explosive and 0 ppm for total VOCs) were detected during screening soil samples and boreholes while drilling, levels above background were not detected in the breathing zone. The air monitoring readings and observations are documented on Air Monitoring Forms which are included in Appendix D.

2.12 Survey and Mapping

Sampling points, including soil borings, test trenches, Hydropunch screening points and monitoring wells installed as part of the remedial investigation, were surveyed by YEC, Inc. of Valley Cottage, New York. The test trenches were surveyed for horizontal control for waste delineation purposes. Vertical and horizontal control of the monitoring well casings were surveyed to the nearest hundredth (0.01 foot) and the elevations were tied into the National Geodetic Vertical Datum (NGVD) of 1929, which is in relation to mean sea level (msl). The ground surface elevations at the monitoring wells, Hydropunch locations and soil borings were also surveyed for preparation of geologic cross sections. A property boundary survey was also performed and included a deed search for the site and adjoining sites, a search for existing property markers, surveying of existing fence lines, and installation of permanent property markers (monuments). The property boundary has been placed on all site maps prepared for this report. All surveying is completed in the New York State coordinate system, Long Island zone. The surveyor's report and map are provided in Appendix N.

An environmental data management system, GIS/Key, was utilized to organize and present analytical and geologic data. Analytical data for the surface soils, soil borings and groundwater (Hydropunch and monitoring well) has been entered into GIS/Key in a separate directory set up exclusively for the Sonia Road Landfill site. Analytic and geologic data entered into the GIS/Key database was subsequently utilized to generate groundwater contour maps and other maps to illustrate groundwater chemical data as shown in Sections 3.0 and 4.0.

2.13 Health and Safety Program

Prior to performance of the remedial investigation field program, and as part of the Work Plan, a Health and Safety Plan was prepared in order to establish occupational health and safety requirements, responsibilities and procedures to protect workers during the field investigation at the Sonia Road Landfill site. The requirements for worker health and safety were based on the following:

- The Standard Operating Safety Guides. US Environmental Protection Agency (EPA), Office of Emergency and Remedial Response;
- The Occupational Health and Safety Administration (OSHA) Regulations, 29 CFR Parts 1019.120 and 1926;
- NYSDEC Division of Hazardous Waste Remediations Technical and Administrative Memorandums 4016 and 4031;
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH, OSHA, USCG and EPA;
- Health and Safety Procedures for Hazardous Waste Sites. Dvirka and Bartilucci Consulting Engineers; and
- Superfund Amendments and Reauthorization Act (SARA), Title I, Section 126.

Activities associated with the remedial investigation were performed in accordance with the Health and Safety Plan. Level D personal protective equipment was maintained throughout the investigation field activities based on results of the Air Monitoring Program.

2.14 Quality Assurance/Quality Control Program

As part of the remedial investigation and Work Plan, a Quality Assurance and Quality Control (QA/QC) Plan was prepared which developed and described the detailed sample collection and analytical procedures to be used to ensure high quality, valid data. The QA/QC analytical

samples collected during the field program are representative of all the sample locations to assure quality control for the soil vapor, soil and groundwater characterization of this site.

2.15 Data Validation

H2M Laboratory, Inc. (H2M), which is a New York State Department of Health (NYSDOH) Environmental Laboratory Approved Program (ELAP) and Contract Laboratory Program (CLP) certified laboratory meeting requirements for performing sample analysis according to NYSDEC 10/95 Analytical Services Protocols (ASP), was utilized to perform the analyses for the soil boring and groundwater (Hydropunch and monitoring well) samples obtained during the remedial investigation. IEA Laboratories, Inc. (IEA) was utilized to perform the analyses for the surface soil and soil vapor samples obtained during the investigation. IEA is also a NYSDOH ELAP and CLP certified laboratory meeting requirements for performing sample analysis according to NYSDEC 10/95 ASP. Surface soil, soil boring and groundwater analytical results were validated at 100 percent by Nancy Potak, a subcontractor to Dvirka and Bartilucci Consulting Engineers. The soil vapor analytical data were not required to be validated. The data validation is discussed in Section 4.3.

3.0 PHYSICAL AND ECOLOGICAL CHARACTERISTICS OF STUDY AREA

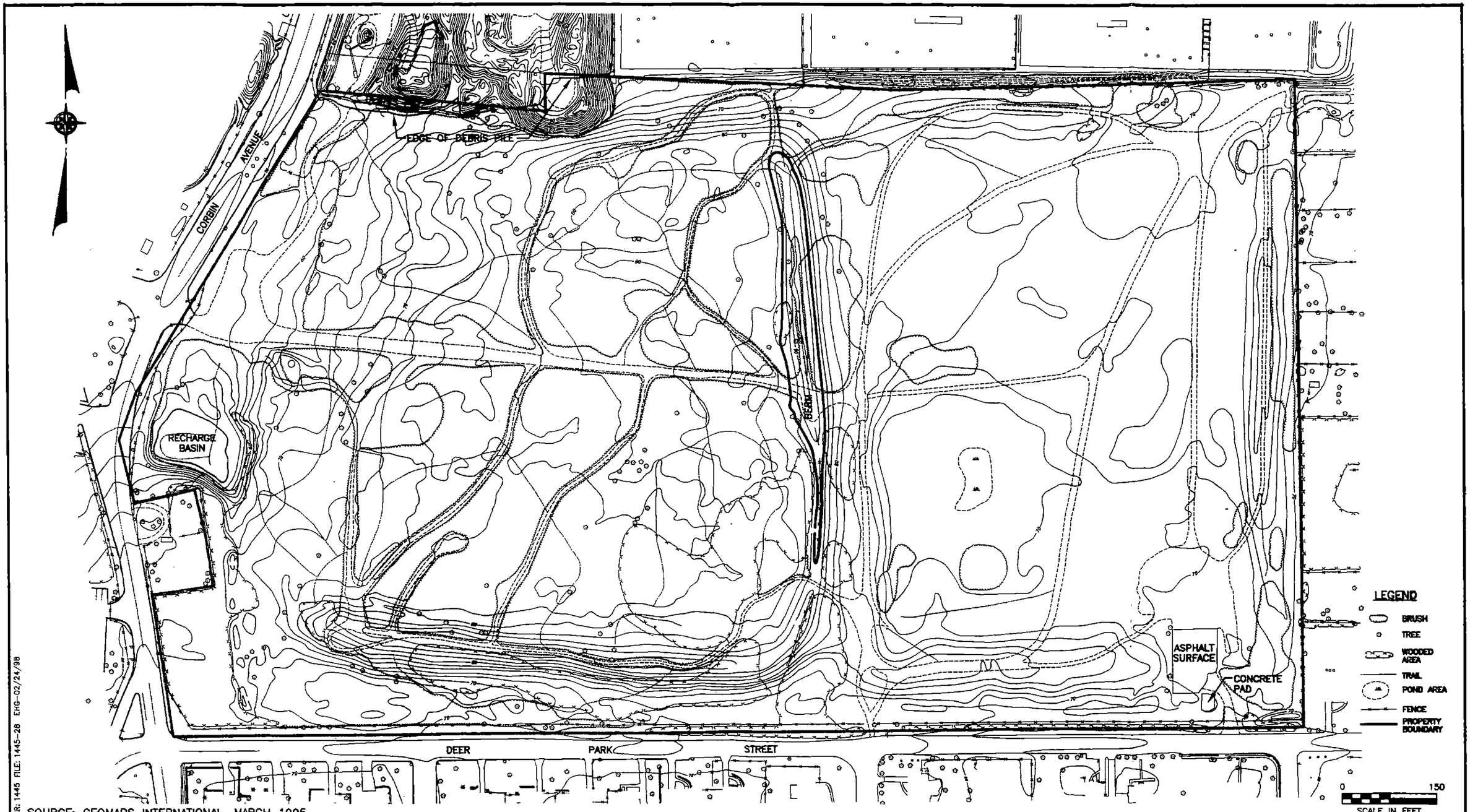
3.1 Surface Features

The Sonia Road Landfill site is characterized by relatively flat to moderately sloping topography (see Figure 3-1). The entire landfill is vacant. The on-site features include an earthen berm in the center of the landfill, which divides the site into east and west, and eathern berms along the southern and eastern boundaries of the site, which provide a screen between the landfill and residential properties located immediately east of the landfill and across Deer Park Street. Several shallow depressions are located in the eastern portion of the landfill where ponding occurs during periods of high precipitation. A small recharge basin, which has eroded and is overgrown with vegetation, is located on the western side of the site. These site features are also shown on Figure 3-1.

The topography surrounding the Sonia Road Landfill is relatively flat and slopes to the south-southeast at approximately 20 feet per mile. The area surrounding the site primarily consists of industrial, commercial and residential properties, a school, Sampawams Creek bed, paved roads, driveways and parking areas. Little undeveloped open land exists in the study area.

3.2 Site Geology

The Sonia Road Landfill is underlain by a thick succession of unconsolidated deposits overlying bedrock. The USGS Hydrogeologic Investigation Atlas HA-709, 1989 (Sheet 1 of 3), reports that the unconsolidated deposits are greater than 1,500 feet thick beneath the landfill site. Based on information from previous reports and data obtained from this investigation, the underlying Upper Glacial aquifer and top of the Gardiners Clay unit have been defined. These geologic formations comprise the stratigraphic unit of concern for this remedial investigation. Provided below is a description of each of these units in descending order, including the waste material which has been disposed at the site.



DIR: 1445 FILE: 1445-28 EHG-02/24/98

SOURCE: GEOMAPS INTERNATIONAL, MARCH 1995

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SITE FEATURES MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3-1

3.2.1 Waste Material

Based on the four on-site soil borings constructed as part of the remedial investigation, SB-01 through SB-04, the thickness of landfilled waste ranges from 32 feet in SB-01 in the north-central portion of the landfill to 59 feet in SB-03 in the south-central portion of the landfill. Based on groundwater level measurements, waste is between 4 feet and 36 feet below the water table at these locations. Directly beneath the waste at each boring location is gray to dark gray fine to coarse sand. The Soil Boring Logs for SB-01 through SB-04 are contained in Appendix G.

The results of the soil borings constructed during this investigation, in general, showed waste to be greater in thickness and deeper into groundwater as compared to the borings constructed as part of the previous study conducted in 1975, which indicated waste to be 29 to 35 feet in thickness and extending from 6 to 11 feet below the water table. However, the location of the earlier soil borings, as illustrated in Figure 2-4, were closer to the perimeter of the landfill as compared to the remedial investigation borings which were located more in the central portion.

Based primarily on observations during construction of the test pits and trenches at the landfill, the waste material consists primarily of plastic bags containing household refuse and decomposed leaves, sand, silt, wood (including plywood, railroad ties, boards, tree trunks and branches), metal (including automobile parts, appliances, scraps and entire automobiles [reported]), plastic, paper, cardboard, glass, and construction and demolition (C&D) debris, comprising mainly concrete and asphalt.

3.2.2 Upper Glacial Deposits

Beneath the landfill and throughout the study area are native unconsolidated glacial outwash deposits of stratified fine to coarse sand and gravel. The Upper Glacial deposits in the study area generally consist of tan fine to coarse sand with little fine to coarse gravel and silt. Approximately 2-4 feet of very fine to fine tan to gray to green sand (occasionally with fine to medium subrounded gravel) was encountered below the coarser sands in several of the borings

and immediately above the Gardiners Clay. The occurrence of the Gardiners Clay marks the bottom of the Upper Glacial deposits.

Based on seven Hydropunch and twelve deep monitoring well boreholes constructed during this investigation, the thickness of the Upper Glacial deposits in the study area ranged from 94 feet at MW-11D to 119 feet at MW-07D and MW-13D. The Soil Boring Logs for the Hydropunch and deep monitoring wells are presented in Appendices H and I, respectively.

Gamma logging was conducted on all of the deep monitoring wells to obtain additional geologic data (Gamma Logs are presented in Appendix K). Reference point 0.0 on the logs is the ground surface. The results of the gamma logging are consistent with the physical descriptions made by the field geologist on the soil samples collected during the borehole drilling. In summary, the site is underlain by stratified sand and gravel with occasional silt, and no laterally extensive silt or clay strata were identified which could act as hydraulic barriers to groundwater flow except for the Gardiners Clay as described below.

3.2.3 Gardiners Clay

Typically, one to two feet of dark gray to dark green silt with little clay was observed at the base of the Upper Glacial deposits overlying the Gardiners Clay. Based on samples collected from the borings, the Gardiners Clay typically consisted of a dark green to dark gray clay of moderate plasticity with little silt. Soil samples at Hydropunch locations GW-H05 through GW-H07 along the southeast side of the landfill also contained trace to little red to brown fibrous peat.

Confirmation of the depth to the Gardiners Clay was supported by gamma logging in monitoring well boreholes MW-01D, MW-06D, MW-07D, MW-10D, MW-12D and MW-13D. The gamma log results from these boreholes indicate that sands (with typically more silty sands near the base of each borehole) were present throughout the borehole and confirmation of the presence and depth to the Gardiners Clay could be interpreted based on the off-scale amplitudes of the gamma logs near the base of these boreholes. Confirmation of the Gardiners Clay was not

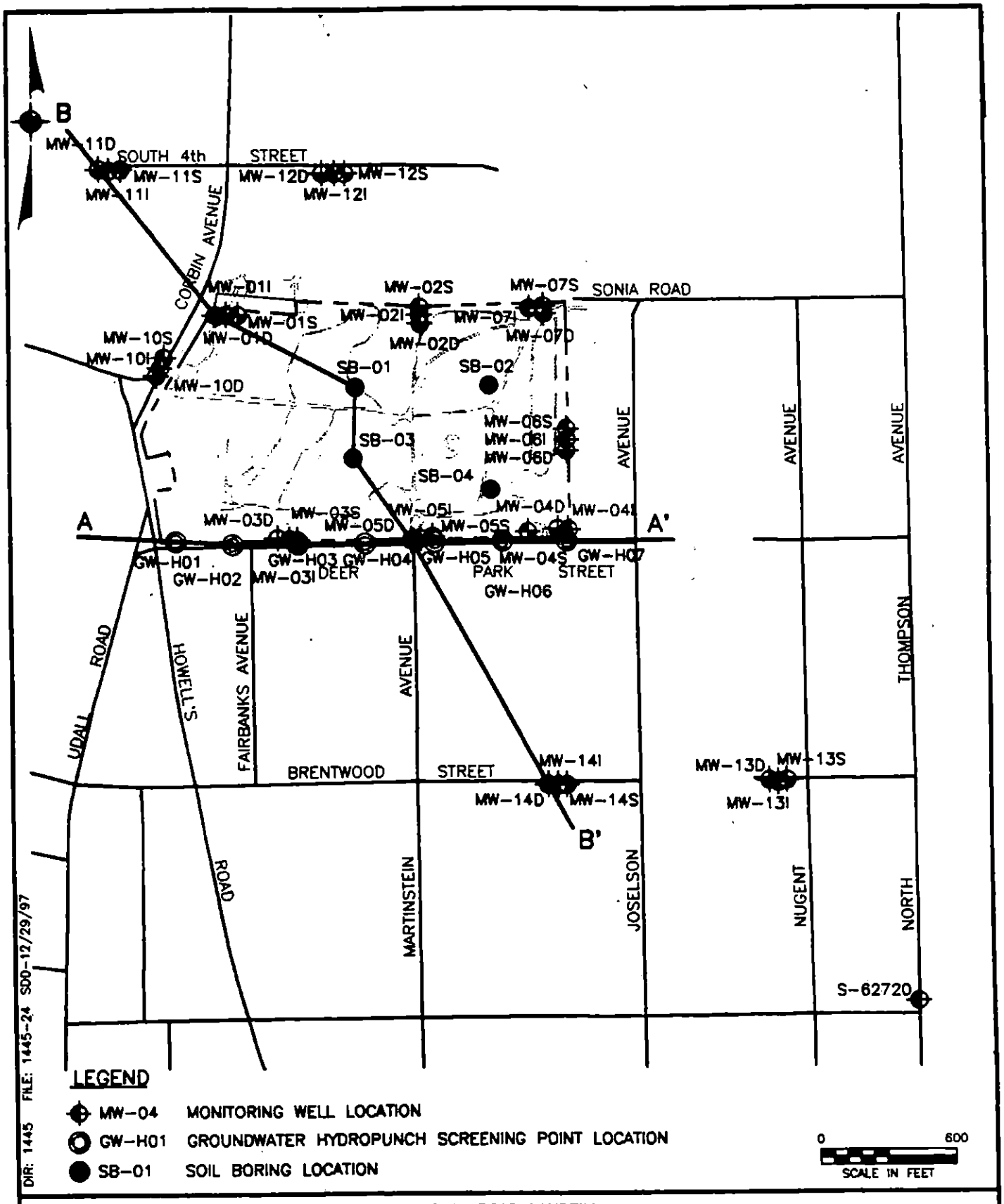
supported by gamma logging in the remaining six deep wells, since the boreholes for these wells did not substantially penetrate the clay unit.

As previously discussed in Section 1.3.9, the thickness of the Gardeners Clay in the vicinity of the landfill is reported to be 9 feet and represents an extensive clay layer in the study area occurring at an elevation of approximately 50 feet below mean sea level (msl). Based on the borings constructed and gamma logging conducted during the remedial investigation, the elevation of the Gardiners Clay ranged from 34.65 feet below MSL at MW-11D to 48.41 feet below MSL at MW-13D. Because the borings constructed during the investigation terminated at the upper surface of the Gardiners Clay, the thickness of the Gardiners Clay in the study area was not determined. Stratigraphically, the Gardiners Clay unit separates the Upper Glacial aquifer from the underlying Magothy aquifer. The Gardiners Clay is underlain by the Matawan Group-Magothy Formation which consists of unconsolidated sand, clayey sand and clay. It is estimated that this formation is approximately 750 feet thick in the study area.

Figure 3-2 presents the locations of two geologic cross sections (A-A' and B-B') which represent the lithology encountered (landfilled waste, Upper Glacial deposits and upper surface of the Gardiners Clay) during the remedial investigation at the Sonia Road Landfill. The surface of the Gardiners Clay is illustrated on Geologic Cross Section A-A' (Figure 3-3) which traverses the southern boundary of the landfill in line with all Hydropunch locations. Figure 3-4 represents Geologic Cross Section B-B' which traverses a broader area from the furthest upgradient off-site monitoring well, through the site, and continuing in the approximate direction of groundwater flow to an off-site downgradient monitoring well.

3.3 Site Hydrogeology

As previously discussed, the stratigraphic unit of concern includes the Upper Glacial aquifer and underlying Gardiners Clay unit. The site hydrogeology has been determined through the collection and analysis of water level data obtained from the 12 monitoring well clusters constructed as part of this investigation and SCDHS monitoring well S-62720. Water level measurements were collected during the remedial investigation on November 4 and 18, 1997.

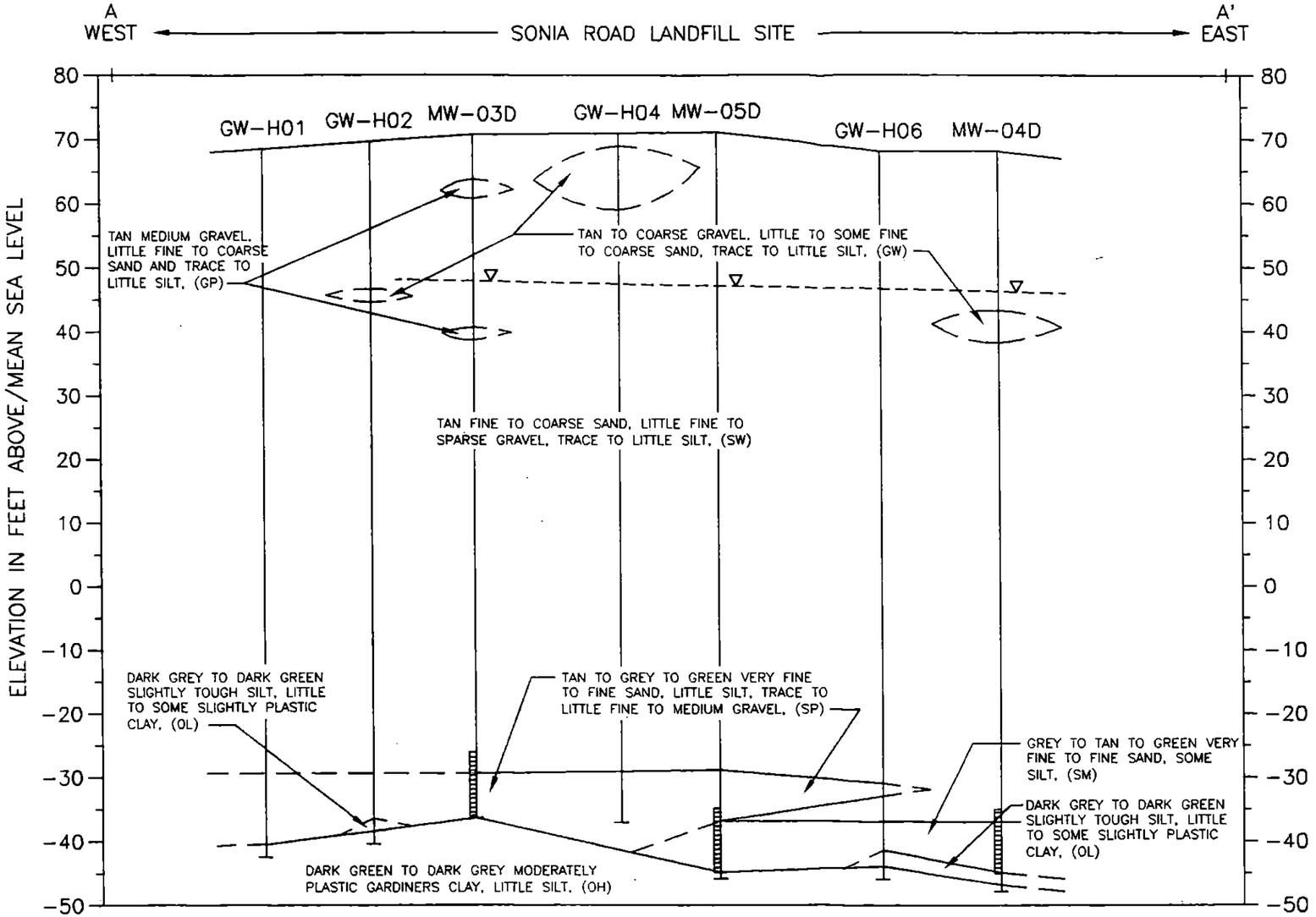


SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

GEOLOGIC CROSS SECTION LOCATIONS

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FIGURE 3-2



LEGEND

GW-H06	GROUNDWATER HYDROPUNCH SCREENING POINT
MW-04D	MONITORING WELL LOCATION
	MONITORING WELL SCREEN
--▽--	DEEP POTENTIOMETRIC SURFACE BASED ON DATA 11/4/97

HORIZONTAL SCALE: 1"=300'
VERTICAL SCALE: 1"=20'

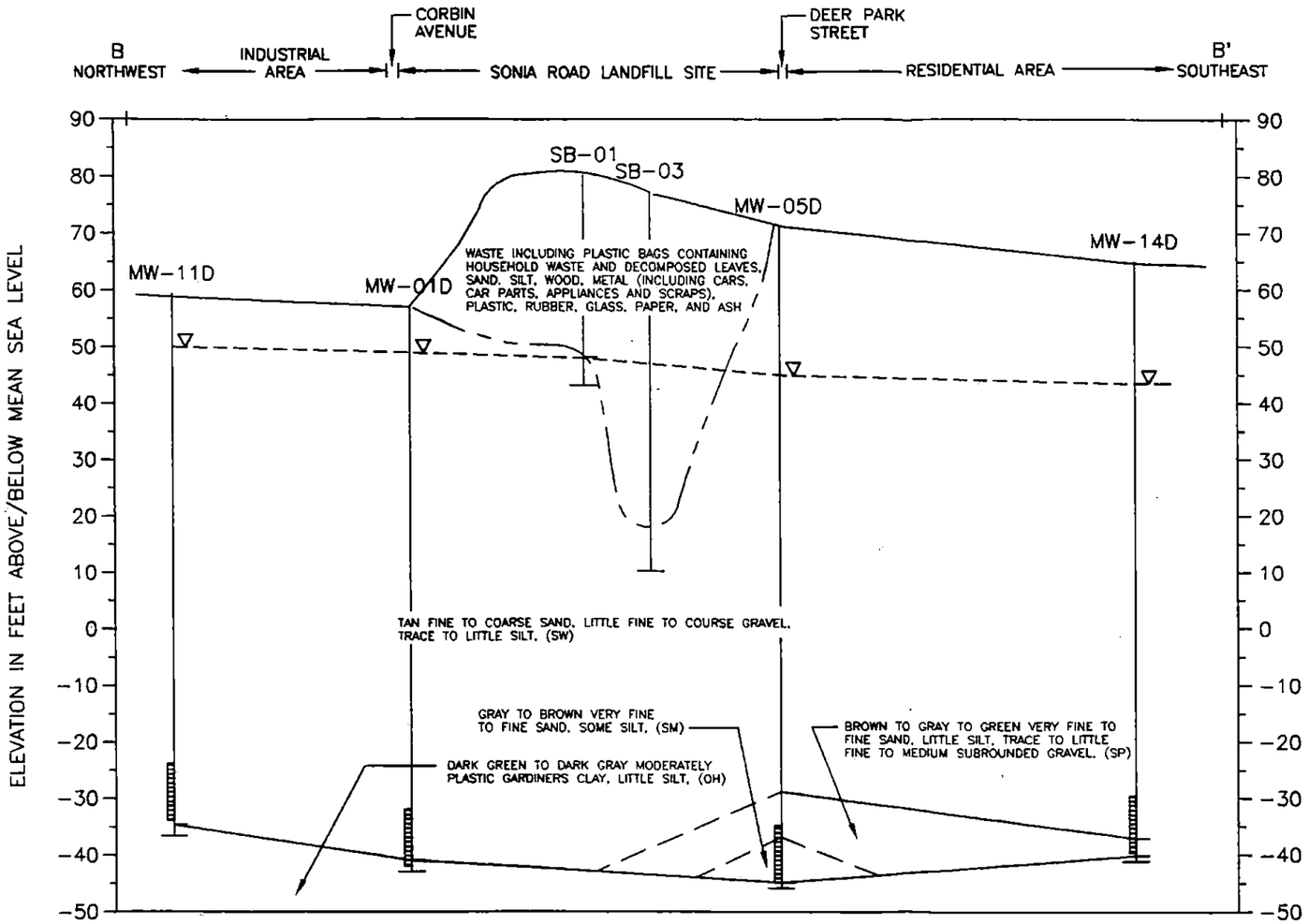
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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

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GEOLOGIC CROSS SECTION A-A'

FIGURE 3-3



HORIZONTAL SCALE: 1"=500'
VERTICAL SCALE: 1"=25'

LEGEND

SB-01	SOIL BORING LOCATION
MW-05D	MONITORING WELL LOCATION
	MONITORING WELL SCREEN
---▽---	DEEP POTENTIOMETRIC SURFACE BASED ON DATA 11/4/97
— — —	APPROXIMATE LIMIT OF WASTE

DIR: 1445 FILE: 1445-26 EHG-01/28/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

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GEOLOGIC CROSS SECTION B-B'

FIGURE 3-4

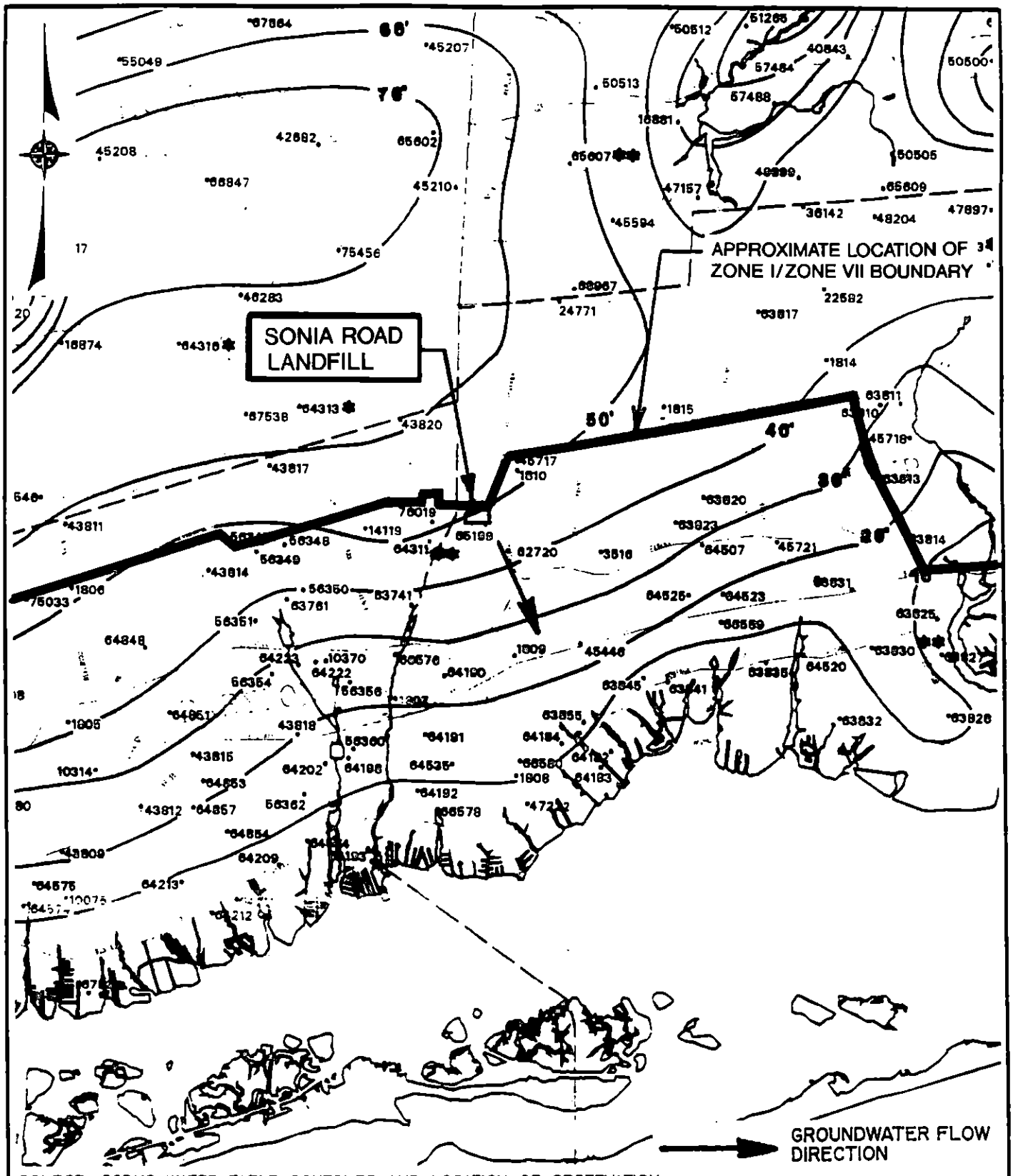
The Sonia Road Landfill is located in the northern portion of Hydrogeologic Zone VII as defined in the Long Island Waste Treatment ("208") Management Plan. Hydrogeologic Zone VII is characterized by shallow groundwater flow systems that discharge to streams and marine waters. The transition zone between Hydrogeologic Zones I and VII is located just to the north of the Sonia Road Landfill. Hydrogeologic Zone I is characterized by deep groundwater recharge contributing to the middle and lower portions of the Magothy aquifer. Verification of the location of the landfill in Zone VII is discussed in Section 3.3.1.4 (Vertical Gradients) below.

3.3.1 Groundwater Flow Patterns

Based on a recent SCDHS Water Table Contour Map (March 1997), the regional groundwater flow direction is to the S-SE to SE (see Figure 3-5). Water level data from November 4 and 18, 1997 were used to generate groundwater contour maps for the water table, intermediate and deep Upper Glacial aquifer zones at and in the immediate vicinity of the Sonia Road Landfill. The groundwater elevation data is presented in Table 2-4. Water table and potentiometric surface contour maps for the intermediate and deep zones representing the November 4, 1997 data are presented on Figures 3-6, 3-7 and 3-8, respectively. Water table and potentiometric surface contour maps for the intermediate and deep zones representing the November 18, 1997 data are presented on Figures 3-9, 3-10 and 3-11, respectively. Groundwater flow direction in the water table and intermediate and deep zones was consistent between measurement events and zones, and is also fairly consistent with the regional flow map prepared by SCDHS. The results of this investigation show groundwater flow in the vicinity of the Sonia Road Landfill to be in a southeast direction.

3.3.1.1 - Water Table

The depths to groundwater in the shallow water table monitoring wells ranged from 7.32 feet bgs at monitoring well MW-10S on November 18, 1997, to 28.65 feet bgs at MW-02S on November 4, 1997. The water table elevation ranged from 42.66 feet above mean sea level



SOURCE: SCDHS WATER TABLE CONTOURS AND LOCATION OF OBSERVATION WELLS IN SUFFOLK COUNTY, NY MARCH 1997

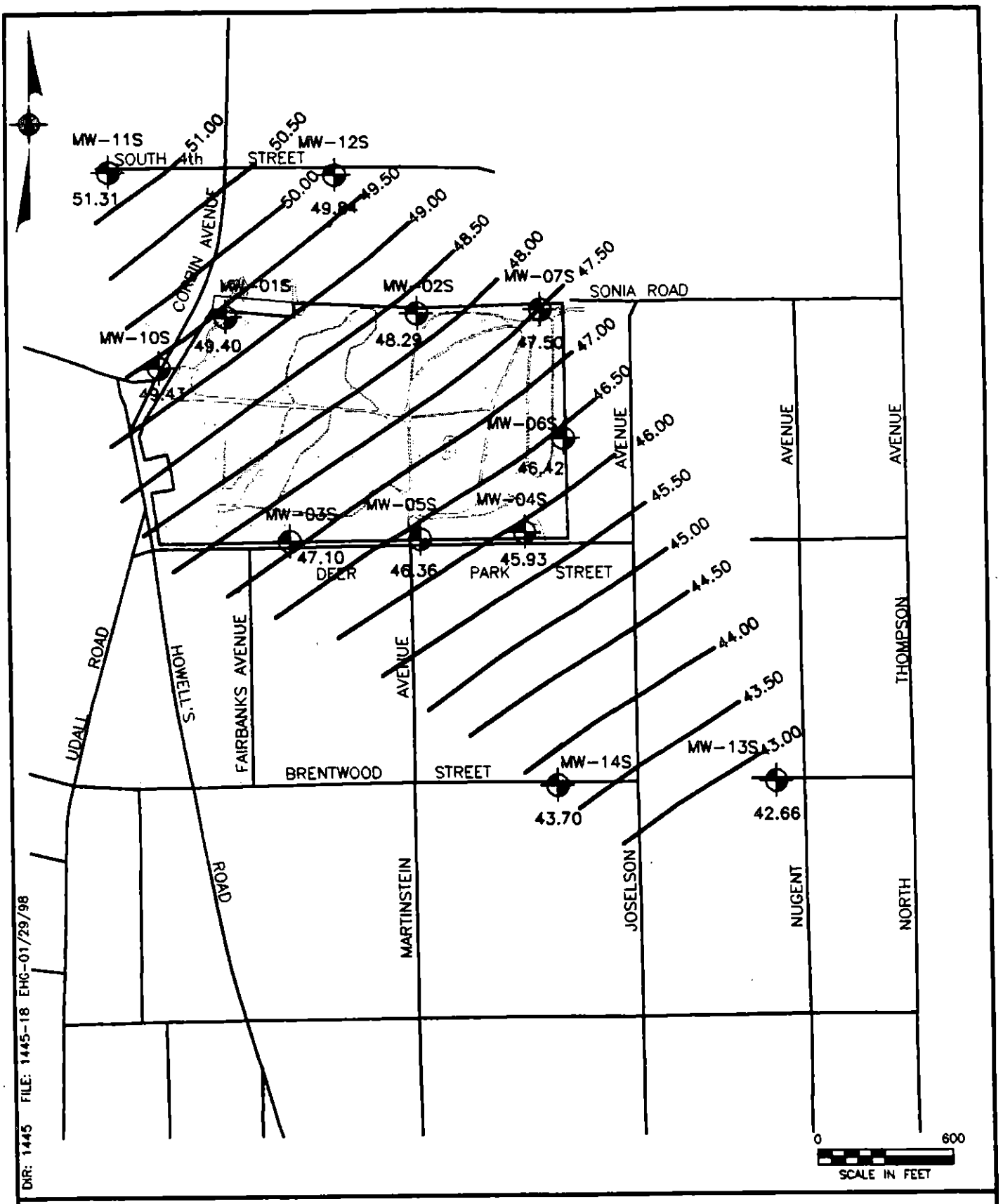
SCALE: 1"=2 MILES

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

REGIONAL WATER TABLE CONTOUR MAP

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FIGURE 3-5



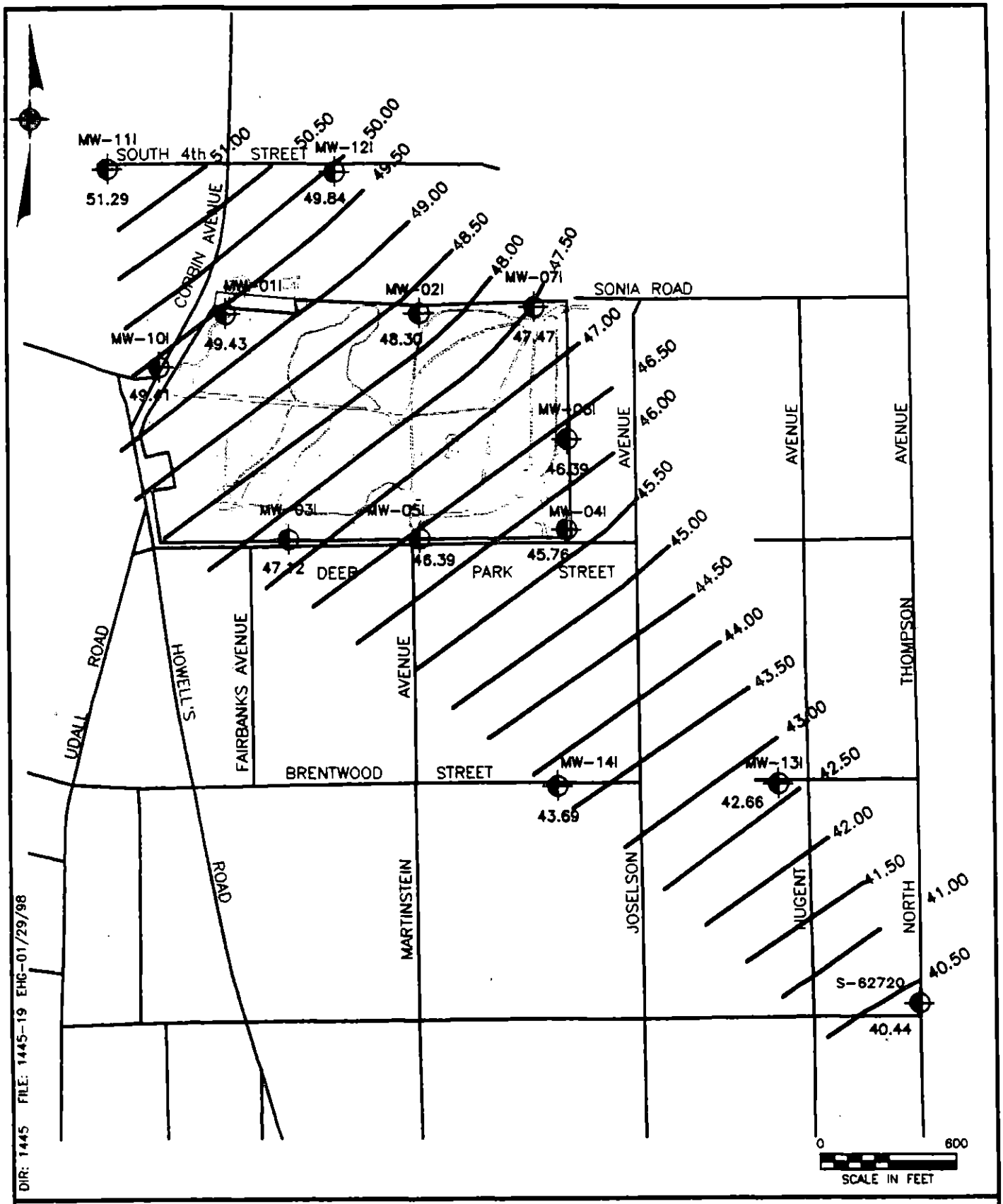
DIR: 1445 FILE: 1445-18 ENG-01/29/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

WATER TABLE CONTOUR MAP
NOVEMBER 4, 1997

Dvirka and Bartilucci Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3-6

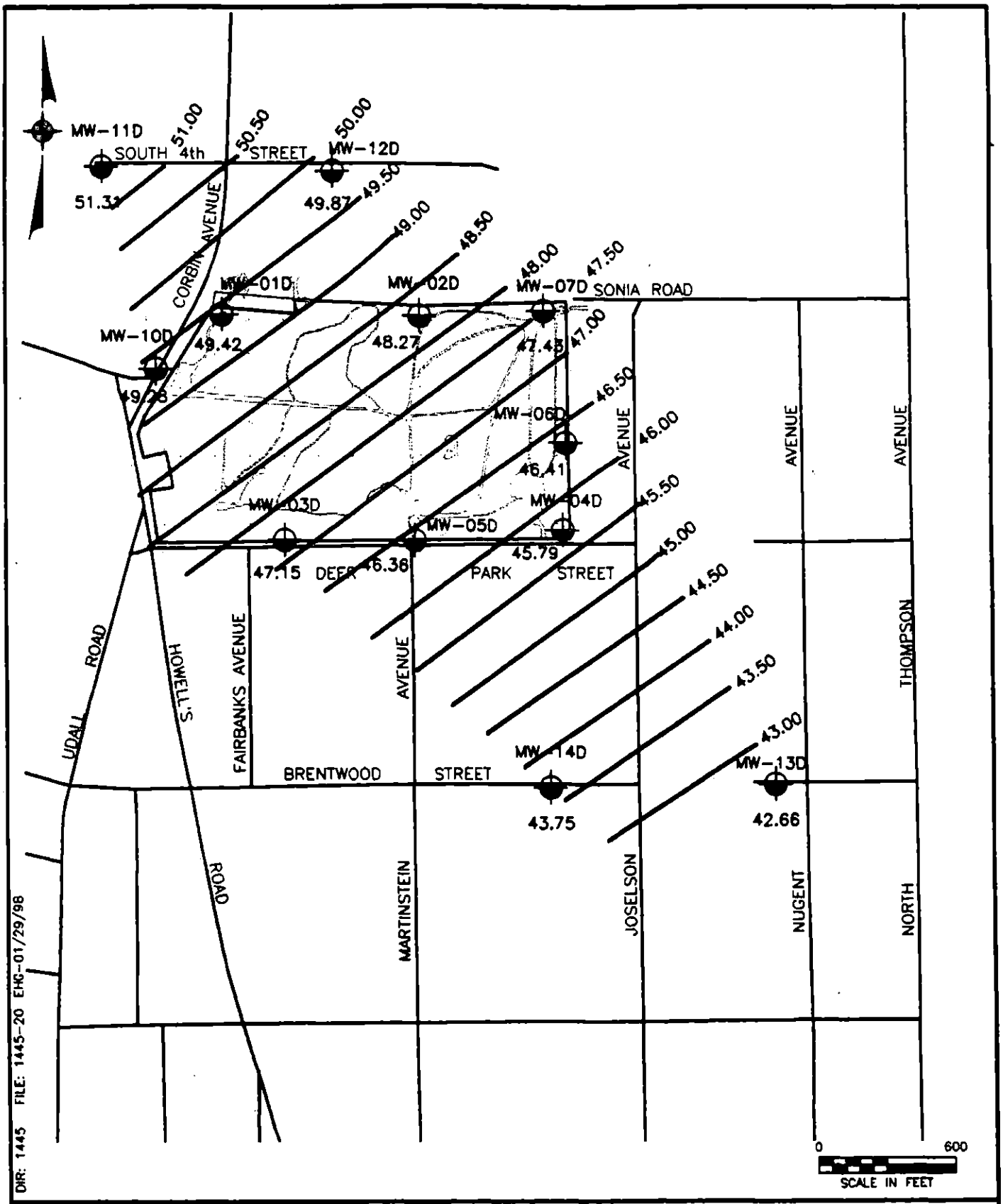


SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

INTERMEDIATE WELL POTENTIOMETRIC SURFACE MAP
NOVEMBER 4, 1997

Dvirka and Bartilucci
Consulting Engineers
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FIGURE 3-7

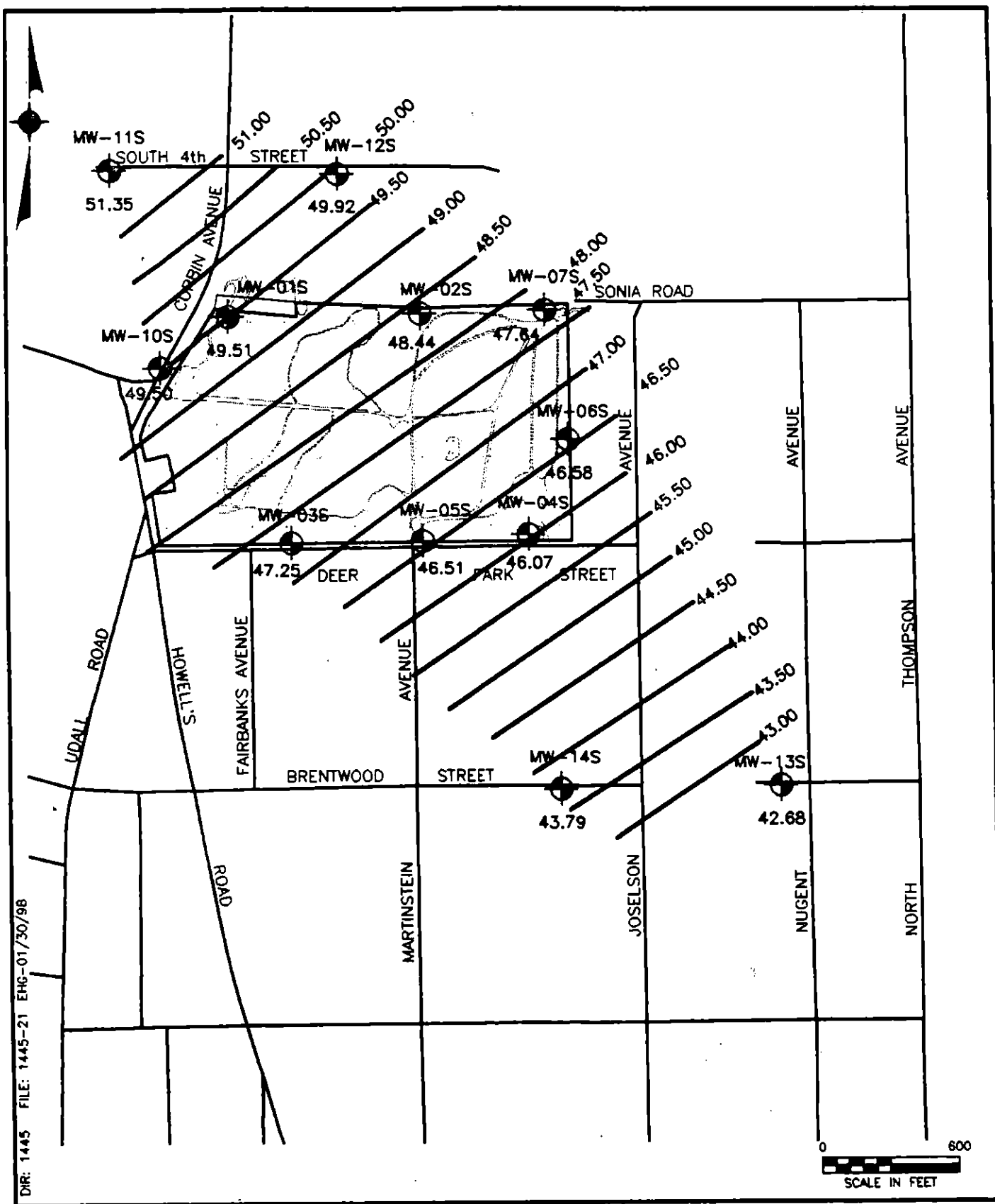


SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DEEP WELL POTENTIOMETRIC SURFACE MAP
NOVEMBER 4, 1997

Dvirka and Bartilucci
Consulting Engineers
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FIGURE 3-8

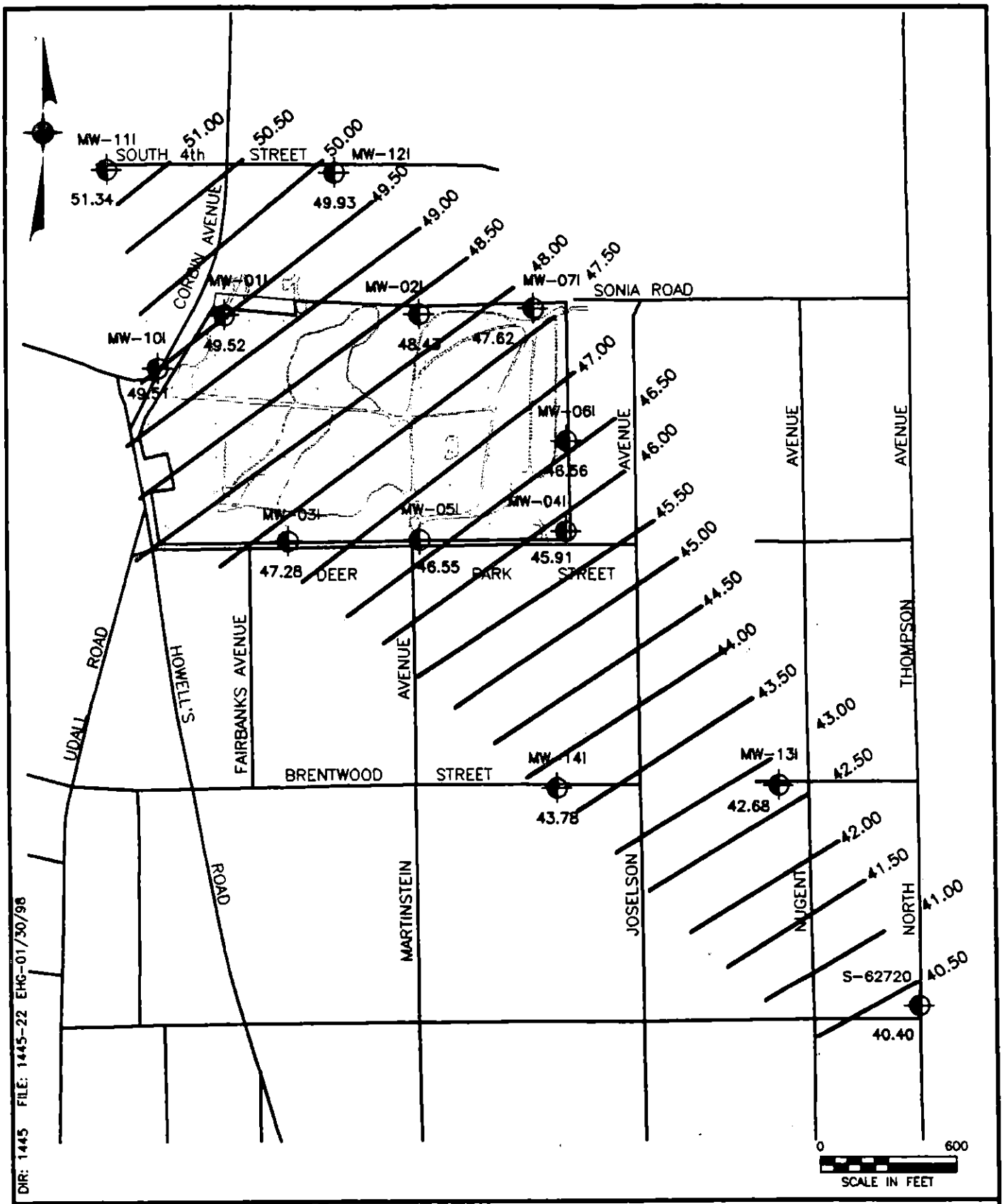


SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

WATER TABLE CONTOUR MAP
NOVEMBER 18,1997

Dvirka and Bartilucci
Consulting Engineers
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FIGURE 3-9

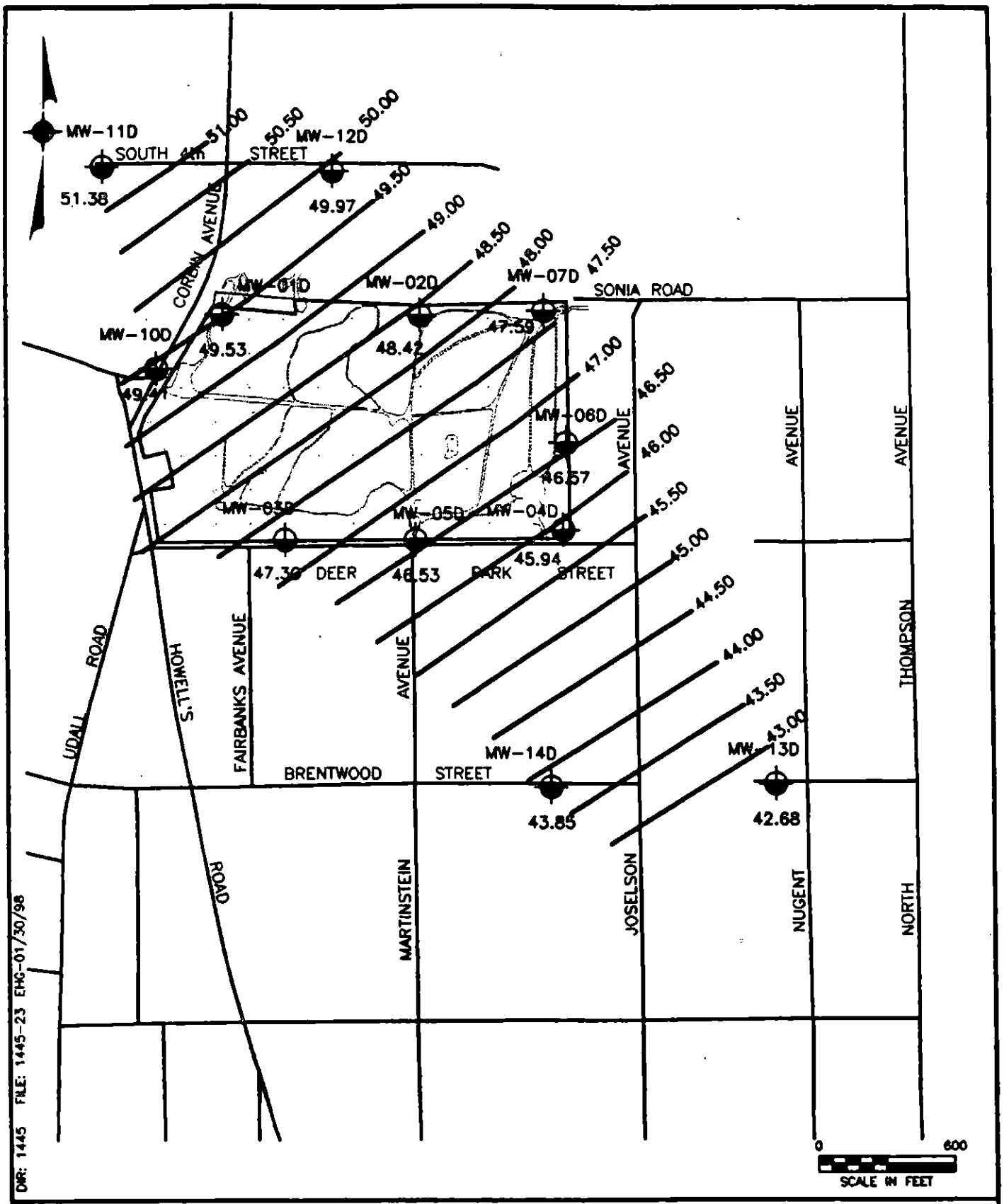


SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

INTERMEDIATE WELL POTENTIOMETRIC SURFACE MAP
NOVEMBER 18, 1997

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FIGURE 3-10



SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DEEP WELL POTENTIOMETRIC SURFACE MAP
NOVEMBER 18, 1997

Dvirka and Bartilucci
Consulting Engineers
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FIGURE 3-11

(MSL) in MW-13S on November 4, 1997, to 51.35 feet above MSL in MW-11S on November 18, 1997. Water level elevation data is presented on Table 2-4. The horizontal gradient across the study area, calculated with the November 4 and 18, 1997 water table elevation data, is 0.0022 ft/ft.

3.3.1.2 - Intermediate Zone of the Upper Glacial Aquifer

The depths to groundwater in the intermediate wells ranged from 7.23 feet bgs at monitoring well MW-10I on November 18, 1997, to 28.53 feet bgs at MW-02I on November 4, 1997. The elevation of the potentiometric surface of the intermediate wells ranged from 40.40 feet above mean sea level (MSL) in S-62720 on November 18, 1997, to 51.34 feet above MSL in MW-11I on November 18, 1997. Water level elevation data is presented on Table 2-4. The horizontal gradient across the study area, calculated with the November 4 and 18, 1997 intermediate well potentiometric surface elevation data, is 0.0022 ft/ft.

3.3.1.3 - Deep Zone of the Upper Glacial Aquifer

The depths to groundwater in the deep wells ranged from 7.42 feet bgs at monitoring well MW-10D on November 18, 1997, to 28.70 feet bgs at MW-02D on November 4, 1997. The elevation of the potentiometric surface of the deep wells ranged from 42.66 feet above mean sea level (MSL) in MW-13D on November 4, 1997, to 51.38 feet above MSL in MW-11D on November 18, 1997. Water level elevation data is presented on Table 2-4. The horizontal gradient across the study area, calculated with the November 4, 1997 deep well potentiometric surface elevation data, is 0.0022 ft/ft. A horizontal gradient of 0.0023 ft/ft was calculated with the November 18, 1997 groundwater data.

3.3.1.4 - Vertical Gradients

Vertical gradients were calculated for the shallow/intermediate, intermediate/deep and shallow/deep zones of the Upper Glacial aquifer for the 12 well clusters constructed in the study

area. Since monitoring well MW-04S is located approximately 160 feet to the west of MW-04I and MW-04D, only intermediate/deep zone vertical gradients were calculated for the monitoring well MW-04D cluster. The vertical gradients were calculated utilizing the groundwater level measurements collected on November 4 and 18, 1997. Vertical gradient calculations are presented in Table 3-1.

The vertical gradients for all wells and zones were generally small, being less than or slightly greater than 0.001 ft/ft, except for MW-10 intermediate/deep zone. The vertical gradients at well cluster MW-10 were 0.38 and 0.49 ft/ft downward in the intermediate/deep zone utilizing both the November 4 and 18, 1997 data, respectively.

Considering the Upper Glacial aquifer as a single flow regime (shallow/deep zone water level comparison) slight upward gradients or no vertical potential (0.0 ft/ft) were calculated in 6 of the 11 monitoring well clusters (MW-01, MW-03, MW-05, MW-11, MW-12 and MW-14). Three of these locations (MW-11 and MW-12 [upgradient] and MW-14 [downgradient]) are considered outside of the influence of the landfill.

Slight downward gradients for the entire Upper Glacial aquifer zone were calculated in 4 of the 11 monitoring well clusters (MW-02, MW-06, MW-07 and MW-10 with both sets of data, except for MW-10, which exhibited a strong downward gradient of 0.18 ft/ft on November 4, 1997. All of the well clusters are within the landfill boundaries, except for MW-10, which is located immediately adjacent and to the west of the landfill.

A 0.0 ft/ft vertical gradient ("no vertical potential") was calculated for the MW-13 well cluster for all three zones with both sets of data. This cluster location can also be considered outside of the influence of the landfill.

Table 3-1

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF VERTICAL GRADIENTS

Well #	Aquifer Zone	Vertical Gradient (ft/ft) 11/4/97	Vertical Potential 11/4/97	Vertical Gradient (ft/ft) 11/18/97	Vertical Potential 11/18/97
MW-01S	Shallow	0.00053	Upward	0.00018	Upward
MW-01I	Intermediate				
MW-01I	Intermediate	0.00034	Downward	0.00034	Upward
MW-01D	Deep				
MW-01S	Shallow	0.00023	Upward	0.00023	Upward
MW-01D	Deep				
MW-02S	Shallow	0.00024	Upward	0.00024	Downward
MW-02I	Intermediate				
MW-02I	Intermediate	0.00068	Downward	0.00023	Downward
MW-02D	Deep				
MW-02S	Shallow	0.00025	Downward	0.00012	Downward
MW-02D	Deep				
MW-03S	Shallow	0.00036	Upward	0.00054	Upward
MW-03I	Intermediate				
MW-03I	Intermediate	0.0013	Upward	0.00088	Upward
MW-03D	Deep				
MW-03S	Shallow	0.00064	Upward	0.00064	Upward
MW-03D	Deep				
MW-04I	Intermediate	0.00069	Upward	0.00069	Upward
MW04D	Deep				
MW-05S	Shallow	0.00072	Upward	0.00096	Upward
MW-05I	Intermediate				
MW-05I	Intermediate	0.00067	Downward	0.00045	Downward
MW-05D	Deep				

Table 3-1 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF VERTICAL GRADIENTS

Well #	Aquifer Zone	Vertical Gradient (ft/ft) 11/4/97	Vertical Potential 11/4/97	Vertical Gradient (ft/ft) 11/18/97	Vertical Potential 11/18/97
MW-05S	Shallow	0.00	No Vertical	0.00023	Upward
MW-05D	Deep				
MW-06S	Shallow	0.00070	Downward	0.00046	Downward
MW-06I	Intermediate				
MW-06I	Intermediate	0.00049	Upward	0.00025	Upward
MW-06D	Deep				
MW-06S	Shallow	0.00012	Downward	0.00012	Downward
MW-06D	Deep				
MW-07S	Shallow	0.00069	Downward	0.00046	Downward
MW-07I	Intermediate				
MW-07I	Intermediate	0.00087	Downward	0.00066	Downward
MW-07D	Deep				
MW-07S	Shallow	0.00079	Downward	0.00056	Downward
MW-07D	Deep				
MW-10S	Shallow	0.00035	Downward	0.00017	Upward
MW-10I	Intermediate				
MW-10I	Intermediate	0.49	Downward	0.38	Downward
MW-10D	Deep				
MW-10S	Shallow	0.18	Downward	0.0011	Downward
MW-10D	Deep				
MW-11S	Shallow	0.00035	Downward	0.00018	Downward
MW-11I	Intermediate				
MW-11I	Intermediate	0.00085	Upward	0.0017	Upward
MW-11D	Deep				

Table 3-1 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF VERTICAL GRADIENTS

Well #	Aquifer Zone	Vertical Gradient (ft/ft) 11/4/97	Vertical Potential 11/4/97	Vertical Gradient (ft/ft) 11/18/97	Vertical Potential 11/18/97
MW-11S	Shallow	0.00	No Vertical	0.00037	Upward
MW-11D	Deep				
MW-12S	Shallow	0.00	No Vertical	0.00018	Upward
MW-12I	Intermediate				
MW-12I	Intermediate	0.0010	Upward	0.0014	Upward
MW-12D	Deep				
MW-12S	Shallow	0.00036	Upward	0.00059	Upward
MW-12D	Deep				
MW-13S	Shallow	0.00	No Vertical	0.00	No Vertical
MW-13I	Intermediate				
MW-13I	Intermediate	0.00	No Vertical	0.00	No Vertical
MW-13D	Deep				
MW-13S	Shallow	0.00	No Vertical	0.00	No Vertical
MW-13D	Deep				
MW-14S	Shallow	0.00022	Downward	0.00022	Downward
MW-14I	Intermediate				
MW-14I	Intermediate	0.0018	Upward	0.0021	Upward
MW-14D	Deep				
MW-14S	Shallow	0.00064	Upward	0.00076	Upward
MW-14D	Deep				

*Monitoring well MW-04S is located 160' to the west of monitoring well MW-04I, and therefore, vertical gradients were not calculated utilizing MW-04S.

These vertical gradient results, except for a few of the wells located immediately adjacent to the landfill, confirm that the Sonia Road Landfill is located in a zone of groundwater discharge (upward flow) and that the landfill has a slight mounding effect on the water table beneath and in the immediate vicinity of the landfill.

3.3.1.5 - Groundwater Velocity

Grain size distribution data was assessed for split spoon sediment samples collected within the screen zone during the installation of the five monitoring wells as part of the hydrogeologic study conducted for the Sonia Road Landfill by Golder Associates in 1995. The average hydraulic conductivity of the sediments for the shallow wells, based on Hazen formula estimates (Sower, 1979), was approximated to be 0.002 ft/sec. The grain size distribution analyses and calculation sheet for the permeability estimates are provided in Appendix O.

A general approximation of groundwater flow velocity was made in the Golder Hydrogeologic Assessment Report using the estimated horizontal hydraulic gradient ($i = 0.0019$ ft/ft) and the estimate of hydraulic conductivity ($K = 0.002$ ft/sec) in the Darcey's Law formula $\mu = Ki$. This calculation yielded an estimated groundwater velocity at the site of approximately 0.33 ft/day or about 120 ft/yr.

As stated in the Golder report, the Hazen formula provides only an order of magnitude estimation of hydraulic conductivity. A two-fold increase in conductivity will produce a two-fold increase in groundwater flow velocity (i.e., 240 ft/yr). In addition, porosity will influence solute transport rates for the center of mass of non-retarded species. Assuming a porosity of 50%, solute transport would be approximately twice the groundwater flow rate. Refinement of these hydraulic parameters could be obtained by site-specific field testing, such as slug testing or pump testing, if it was necessary as a result of the remedial action selected for the site.

3.4 Soil Cover Thickness

Based on the 20 test pits (TP-1 through TP-20) constructed throughout the Sonia Road Landfill during the remedial investigation, the thickness of the soil cover ranged from approximately 3" at TP-10, located in the central portion of the landfill, to 30" at TP-19, located in the south-central portion of the landfill (see Figure 2-3). However, there are portions of the landfill where waste was observed at the surface. The soil cover thickness measured for each test pit is presented in Table 3-2. In addition, the soil cover thickness was one foot at soil boring location SB-01, two feet at SB-02 and SB-03, and four feet at SB-04, as previously discussed in Section 3.2

Based on these results, the average thickness of existing soil cover at the Sonia Road Landfill is about one foot. The thickness of soil cover is greater in the eastern portion of the landfill as compared to the western portion. This is likely the result of development of the former ballfields in the eastern area of the site.

3.5 Waste Delineation

Based on the 63 test trenches constructed along the perimeter of the Sonia Road Landfill, the horizontal extent of the waste has been delineated, the limits of which are illustrated in Figure 3-12. As shown on this figure, along the northern boundary of the landfill waste has been found north of the property line.

Based on test trenches constructed on the eastern boundary of the landfill, waste may have been disposed beyond the landfill boundary adjacent to one residential property. This property is located between test trenches TT-16A and TT-17. The waste thickness was at least three feet at the property boundary at TT-16A and approximately three feet at the property boundary at TT-17. The Town has been unable to gain access to this property for further off-site delineation. Waste may have also been disposed beyond the landfill boundary between

Table 3-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL COVER THICKNESS

Test Pit Number	Soil Cover Thickness (ft.)
TP-1	½
TP-2	¾
TP-3	½
TP-4	1
TP-5	1
TP-6	1
TP-7	2
TP-8	½
TP-9	1
TP-10	¼
TP-11	2
TP-12	1
TP-13	2
TP-14	½
TP-15	1
TP-16	1
TP-17	¾
TP-18	½
TP-19	2½
TP-20	2
Average	1.1

test trenches TT-5 and TT-7A in the northwestern corner of the landfill where a construction and demolition recycling operation stored material on the Town's 60-foot paper street adjacent to the landfill property.

Removal of waste beyond the landfill property boundary will be addressed as part of the Presumptive Remedy. Since, in general, waste was found to increase in depth rapidly at the limit of waste, there appears to be little opportunity for waste consolidation to decrease the area/footprint of the landfill cap. However, this will be addressed in greater detail in the Presumptive Remedy Engineering Design Report.

3.6 Ecology

This section provides an overall habitat based assessment of the Sonia Road Landfill site. This assessment conforms to the guidelines contained in Step 1 of the NYSDEC Technical and Administrative Guidance Memorandum, entitled "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites" (October 1994). The purpose of this section is to provide a description of the existing ecology of the site, including a site-specific description of major habitat types with associated wildlife populations, and identify any other significant on-site resources. The information contained in this section was obtained during the remedial investigation field program and supplemented with data from outside sources, including the NYSDEC, U.S. Fish and Wildlife Service, New York State Historic Preservation Office, Town of Islip and Long Island Regional Planning Board. The field survey for this assessment was conducted on August 22, 1997.

3.6.1 Major Habitat Types

The Sonia Road site is an upland area located approximately 7,000 feet south of Pilgrim State Hospital and 2,500 feet northeast of the headwaters to Sampawams Creek. The site is bordered on the north and west by industrial facilities and on the south and east by residential communities. The site is characterized by predominantly disturbed lands with vegetated buffers

on the eastern and southern site perimeters. Prior to being used as a municipal solid waste landfill, the site was used for mining of sand and gravel and consisted of disturbed lands with uncleared areas along the eastern and western perimeters. The vegetative buffer, which consists primarily of deciduous trees, ranges from 30 feet thick on the eastern and southern perimeters to 100 feet on the southwestern perimeter. Primary successional vegetative woody communities also exist along a berm which bisects the site into an east and west section, and along areas which appear to be historic travel corridors on the western portion of the landfill. Black locust, honey locust and cherry trees are the dominant species in these locations. The majority of the site is characterized as grassland/field habitat where vegetative communities tend to be either monotypic or dominated by a few species. The major habitat types for the site are listed as follows:

- Grassland/Field: Herbaceous, non-woody growth ranging from one to six feet tall;
- Forested/Grassland/Field: Mixture of herbaceous and woody vegetation where trees are present but not dominant;
- Forested: Woody vegetation dominates with trees typically 20 to 35 feet high;
- Field/Wet Area: Herbaceous facultative upland species somewhat stunted due to localized poor drainage; and
- Stressed Habitat: Areas devoid or sparsely vegetated with low growth herbaceous plants surrounded by herbaceous vegetation four to six feet tall.

Habitat types bordering the landfill are not shown but fall into three categories: paved industrial area; cut/fill lands; and residential cultivated lawns. The eastern and southern borders of the site abut residential developments consisting of single family homes on one quarter to one half acre lots following Sonia Road and Deer Park Street. North of the site is an area predominantly paved to permit loading/off-loading/storage of truck trailers at warehouse type structures. The property west of the site is cut/fill land relatively denude of vegetation as part of a sand mining and aggregate batching plant operation.

The distribution of habitat types/vegetative cover for the Sonia Road Landfill is displayed on Figure 3-13. Detailed discussion of the major communities found on the site are described below in greater detail. A list of vegetative species observed on the site is provided in Table 3-3.

3.6.1.1 - Grassland/Field

This cover type is found over approximately 80% of the landfill. These areas have naturally revegetated as the landfill operation became inactive. This habitat is distinctively different on the eastern and western sections of the site with the area of delineation a berm which bisects the property and is largely forested. The east section of the site consists largely of grass family species such as witchgrass, (Panicum capillae) and fall panicum (Panicum dichotomiflorum) with interspersed wildflowers including daisy (Chrysanthemum sp), chickory (Cichorium intybus) and common goldenrod (Solidago juncea). The height of vegetation in this area at the peak of the growing season is up to three feet. The western section is dominated by wildflower growth and has little grass species presence. Dominant wildflowers include several types of asters (Aster sp.), Queen Anne's Lace (Daucus carota), Bull thistle (Cirsium vulgare) and chickory. Other dominant species included common ragweed (Ambrosia artemisiifolia) and common goldenrod. Vegetation in the western cell was typically six feet tall for this covertype.

3.6.1.2 - Forested/Grassland/Field

This cover type represents approximately 5% of the Sonia Road Landfill and differs from the grassland/field cover type by the interspersal of black locust (Quercus velutina) trees up to 20 feet tall. This habitat is found only within the western section. Herbaceous vegetation is consistent with the monotypic wildflower cover described above for the western section.

3.6.1.3 - Forested

This cover type makes up most of the remaining 15% of the cover on the site. Trees are primarily deciduous with some conifer along the northern buffer zone between the site and the

Table 3-3

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
VEGETATIVE SPECIES OBSERVED ON THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Herbaceous Plants	
Yarrow	Achillea millefolium
Common ragweed	Ambrosia artemisiifolia
Pearly everlasting	Anaphalis margaritacea
Little blue stem grass	Andropogon scoparius
Dogbane	Apocynum androsaemifolium
Hemp dogbane	Apocynum cannibinum
Bearberry	Arctostaphylos uva-ursi
Butterflyweed	Asclepias tuberosa
Aster	Aster spectabilis
Aster	Aster undulatus
Wild indigo	Baptisia sp.
Devil's-beggarticks	Bidens frondosa
Common lambsquarters	Chenopodium album
Spotted wintergreen	Chimaphila maculata
Daisy	Chrysanthemum sp.
Chickory	Cichorium intybus
Bull thistle	Cirsium vulgare
British soldiers	Cladonia cristatella
Crown vetch	Coronilla varia
Lady's slipper	Cypripedium acaule
Poverty grass	Danthonia spicata
Queen Anne's lace	Daucus carota
Hayscented fern	Dennestaedtia punctilobula
Tick-trefoil	Desmodium sp.
Crabgrass	Digitaria sp.
Strawberry	Fragaria virginiana
Orange hawkweed	Hieracium aurantiacum
Blue flag	Iris versicolor
Narrow-leafed bush clover	Lespedeza augustifolia
Bush clover	Lespedeza virginiana
Butter and eggs	Linaria vulgaris
Evening primrose	Oenothera biennis
Royal fern	Osmunda regalis

Table 3-3 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
VEGETATIVE SPECIES OBSERVED ON THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Yellow woodsorrel	Oxalis stricta
Witchgrass	Panicuum capillare
Fall panicum	Panicum dichotomiflorum
Common reed grass	Phragmites communis
Ground cherry	Physalis heterophylla
Pokeweed	Phytolacca americana
Broadleaf plantain	Plantago major
Smartweed, Knotweed	Polygonum sp.
Dock	Rumex acetosella
Nightshade	Solanum dulcamara
Lance-leafed goldenrod	Solidago graminifolia
Common goldenrod	Solidago juncea
Early flowering goldenrod	Solidago nemoralis
Stiff goldenrod	Solidago rigida
Common mullein	Verbascum thapsus
Vetch	Vicia sp.
Shrubs and Vines	
Alder	Alnus rugosa
Barberry	Berberis thunbergii
Leatherleaf	Chamaedaphne calyculata
Forsythia	Forsythia sp.
Huckleberry	Gaylussacia sp.
Winterberry	Ilex verticillata
Male-berry	Lyonia ligustrina
Japanese honeysuckle	Lonicera japonica
Virginia creeper	Parthenocissus quinquefolia
Dwarf sumac	Rhus copallina
Poison ivy	Rhus radicans
Multiflora rose	Rosa multiflora
Catbrier	Smilax rotundifolia
Lowbush blueberry	Vaccinium angustifolium
Highbush blueberry	Vaccinium corymbosum
Summer grape	Vtis aestivalis

Table 3-3 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
VEGETATIVE SPECIES OBSERVED ON THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Fox grape	Vtis labrusca
Trees	
Norway maple	Acer platanoides
Red maple	Acer rubrum
Silver maple	Acer saccharinum
Gray birch	Betula populifolia
Flowering dogwood	Cornus florida
Black gum	Nyassa sylvatica
Red pine	Pinus resinosa
Pitch pine	Pinus rigida
White pine	Pinus strobus
Large-toothed aspen	Populus grandidentata
Quaking aspen	Populus tremuloides
Black cherry	Prunus serotina
White oak	Quercus alba
Scarlet oak	Quercus coccinea
Scrub oak	Quercus illicifolia
Chestnut oak	Quercus prinus
Black oak	Quercus velutina
Black locust	Robinia pseudoacacia
Honey locust	Gleditisia triacanthos

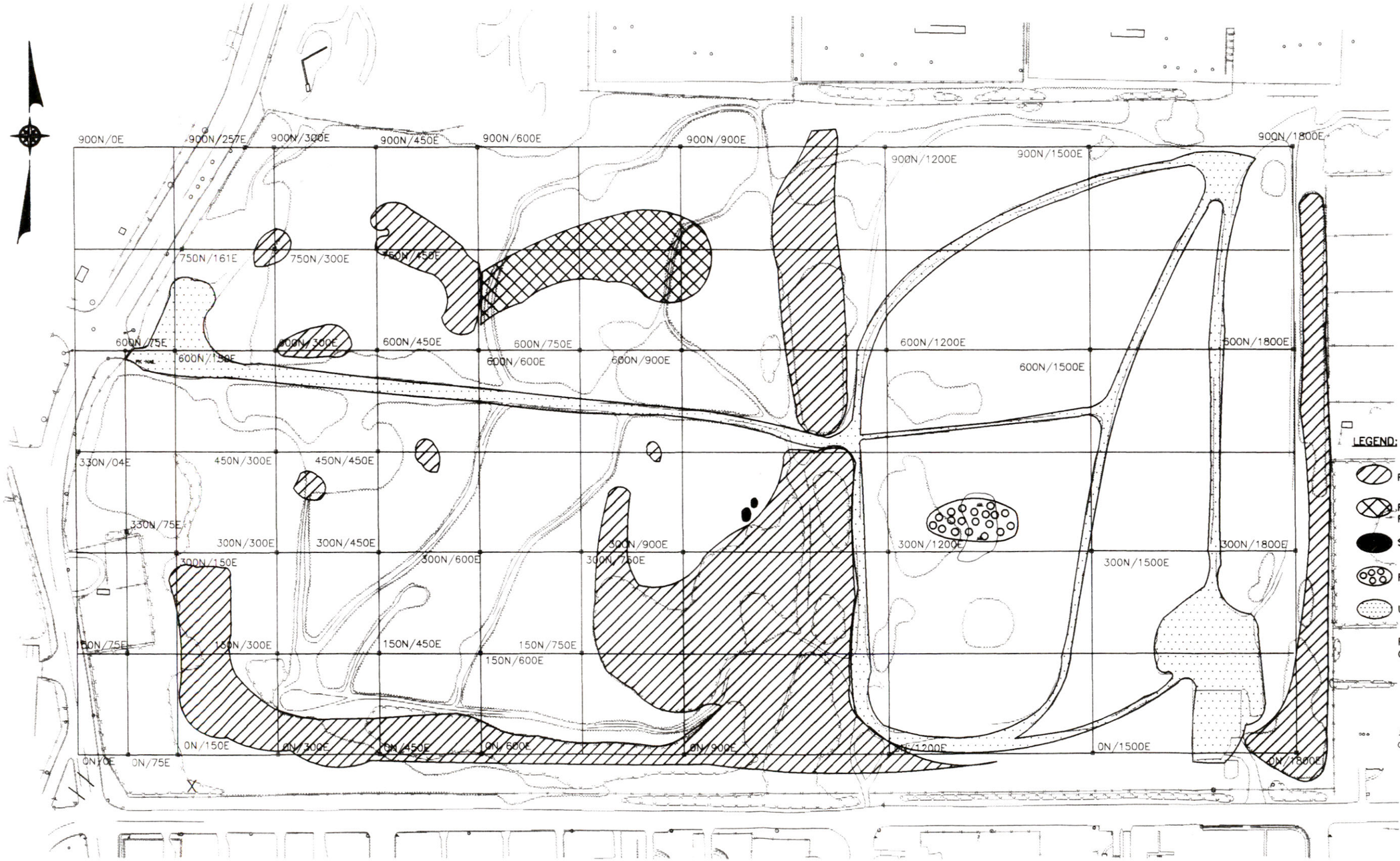
industrial enterprises. The trees largely represent a perimeter screen on the east, south and southwest boundaries. These trees are typically 30 to 50 feet tall and include black cherry (Prunus serotina), black gum (Nyassa sylvatica), quaking aspen (Populus tremuloides), silver maple (Acer saccharinum), white oak (Quercus alba) and black locust. The tree canopy is dense enough to limit ground cover. Forested habitat also exists along the center berm which divides the site into east and west sections. This area is largely dominated by honey locust (Gleditisia triacanthos), black locust and black cherry. Besides the center berm, several clusters of black locust are also found in the western section as illustrated on Figure 3-13. The canopy is not as dense and much of the undergrowth is dominated by common reed (Phragmites communis). The trees are also smaller than along the site perimeter, typically up to 20 feet.

3.6.1.4 - Field/Wet Area

This area represents a pocket of grassland/field habitat within the east portion of the property covering approximately 1,100 square feet. Although the vegetation is of a similar species composition to the east section grassland/field areas, the herbaceous vegetation is somewhat matted in appearance and slightly less vigorous than surrounding vegetation. It appears that all land immediately surrounding this area is sloped to the area, and as a result, rainwater collects in this area. Soils are somewhat poorly drained within the wet area, likely due to the accumulation of fine soil particles over time. There is the potential for hydrophytic vegetation to invade this area although this is not currently the case. This area lacks the hydrology to maintain wetland species and would not be classified as a wetland.

3.6.1.5 - Stressed Habitat

During the habitat survey, an area of stressed vegetation was encountered. This area covers about 150 square feet and is distinctive in that the area is totally devoid of vegetation yet bounded on all sides by black locust and common reed. The soils have a rubbery feel and a black, tar-like substance is present on the surface of the area and appears to ooze to the surface in several locations. It should be noted that during the investigation of this area, a second area of



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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

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VEGETATIVE COVER TYPES

FIGURE 3-13

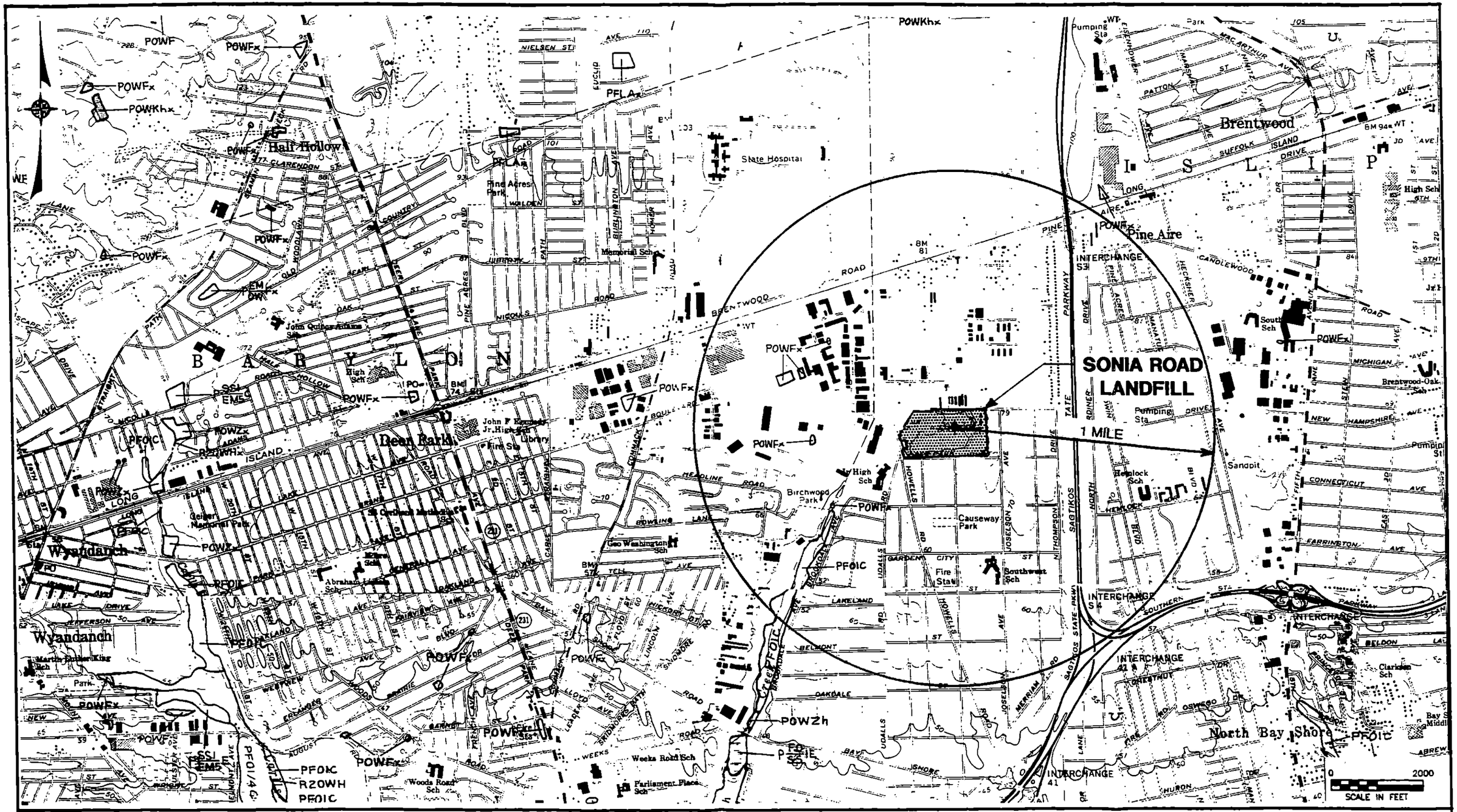
stressed vegetation was located nearby. This second area is approximately 600 square feet and is discussed in more detail in Section 2.9.

3.6.2 Wetlands

There are no New York State or federally regulated wetlands located on or in the vicinity of the Sonia Road Landfill. The nearest wetland is located approximately 2,500 feet to the southwest and is classified by the U.S. Fish and Wildlife Service as a palustrine, broad-leafed forested, seasonally saturated wetland. Wetlands mapped by the U.S. Fish and Wildlife Service as part of the National Wetland Inventory within one mile of the site are displayed on Figure 3-14. The New York State Department of Environmental Conservation maintains no wetland mapping for the site or within one mile of the site. One area within the east section of the landfill shows vegetative stress related to ponding water from rainfall. Vegetation and hydrologic conditions of this area are not indicative of a wetland. Soils analysis indicates that water can be present for extended periods. If left undisturbed, the potential exists that this area, covering roughly 1,100 square feet, could support hydrophytic vegetative species. However, given the location and general characteristics of the site, it is highly unlikely that this area would be regulated at some future point by New York State or the U.S. Army Corps of Engineers.

3.6.3 Mammals

The predominantly developed nature of the areas surrounding the Sonia Road Landfill and the existence of this development at the time the landfill was in operation precludes its habitation by mammals which require a large home range. The only mammals observed during the site survey were feral cats and dogs. In addition, tracks, runways and scats were observed that would indicate the presence of white footed mice (Peromyscus leucopus), meadow voles (Microtus pennsylvaticus), cottontail rabbits (Sylvilagus floridanus) and raccoons (Procyon lotor). Probable mammal inhabitants are listed in Table 3-4.



SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

NATIONAL WETLAND INVENTORY MAP OF SONIA ROAD SITE AND GENERAL SURROUNDING AREA

FIGURE 3-14

Table 3-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MAMMALS LIKELY TO INHABIT THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Eastern mole	Scalopus aquaticus
Eastern chipmunk	Tamias striatus
Gray Squirrel	Sciurus carolinensis
Cottontail rabbit	Sylvilagus floridanus
Mice/voles/shrews	Peromyscus sp., Sorex sp., Microtus sp., Blarina sp.
Raccoon	Procyon lotor

3.6.4 Birds

Birds were present and actively feeding in the grassland/field, scrub/shrub and deciduous forested habitats. A flock of European starlings (Sturnus vulgaris), numbering approximately 150 individuals, was feeding predominantly in the east section within the grassland/field habitats. When disturbed by human presence, the flock would relocate within the same general area and habitat. Some affinity was shown for the area that was wet because of the accumulation and retention of rainwater. A red-tailed hawk (Buteo jamaicensis) was identified through a series of calls and appeared also to be hunting over the grassland/field habitats of the eastern section. The deciduous forested areas supported numerous finches (Carpodacus sp.), mockingbirds (Mimus polyglottus) and sparrows (Melospiza sp.). No breeding was observed although breeding indications would be limited at the time of the site field survey. A subset of the New York State Bird Atlas listing for Suffolk County, New York is presented in Table 3-5 providing species expected to utilize the Sonia Road site.

3.6.5 Fish

There are no open or ponded water systems present on or near the Sonia Road Landfill that would be capable of supporting fish populations.

3.6.6 Reptiles and Amphibians

No reptiles or amphibians were observed on the landfill. The site includes many discarded items within the eastern section that would offer cover to snakes common to the area. Grasslands likely provide habitat for common toad species and possibly box turtles. Table 3-6 contains a list of reptiles and amphibians common to the area that could likely inhabit the site and/or surrounding areas.

Table 3-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
AVIFAUNA LIKELY TO INHABIT THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Canada goose	Branta canadensis
Sharp-shinned hawk	Accipiter striatus
Broad-winged hawk	Buteo platypterus
Red-tailed hawk	Buteo jamaicensis
Kestrel	Falco sparverius
Killdeer	Charadrius vociferus
Herring gull	Larus argentatus
Mourning dove	Zenaida macroura
Yellow-bellied sapsucker	Sphyrapicus varius
Red-bellied woodpecker	Melanerpes carolinus
Downy woodpecker	Picoides pubescens
Hairy woodpecker	Picoides villosus
Eastern kingbird	Tyrannus tyrannus
American crow	Corvus brachyrhynchos
Blue jay	Cyanocitta cristata
Black-capped chickadee	Parus atricapillus
Tufted titmouse	Parus bicolor
White-breasted nuthatch	Sitta carolinensis
Red-breasted nuthatch	Sitta canadensis
Brown creeper	Certhia americana
House wren	Troglodytes aedon
Winter wren	Troglodytes troglodytes
Carolina wren	Thryothorus ludovicianus
Gray catbird	Dumetella carolinensis
Northern mockingbird	Mimus polyglottos
Eastern bluebird	Stalia sialis
American robin	Turdus migratorius
Wood thrush	Hyocichla mustelina
Cedar waxwing	Bonbycilla cedrorum
Solitary vireo	Vireo solitarius
Yellow warbler	Dendroica petechia
Yellow-rumped warbler	Dendroica coronata
Bay-breasted warbler	Dendroica castanea
Blackpoll warbler	Dendroica striata
Pine warbler	Dendroica pinus

Table 3-5 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
AVIFAUNA LIKELY TO INHABIT THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Ovenbird	Seirus aurocapillus
Common yellowthroat	Geothlypis trichas
Eastern meadowlark	Sturnella magna
Common grackle	Quiscalus quiscula
European starling	Sturnus vulgaris
House sparrow	Passer domesticus
Northern cardinal	Cardinalis cardinalis
Indigo bunting	Passerina cyanea
Brown-headed cowbird	Molothrus ater
Scarlet tanager	Piranga olivacea
House finch	Carpodacus mexicanus
Purple finch	Carpodacus purpureus
American goldfinch	Carduelis tristis
Northern junco	Junco hyemalis
Rufous-sided towhee	Pipilo erythrophthalmus
Chipping sparrow	Spizella passerina
Field sparrow	Spizella pusilla
Song sparrow	Melospiza melodia
White-throated sparrow	Zonotrichia albicollis

Table 3-6

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
REPTILES AND AMPHIBIANS LIKELY TO INHABIT
THE SONIA ROAD LANDFILL

Common Name	Scientific Name
Box turtle	Terrapene carolina
Eastern garter snake	Thamnophis sirtalis
Eastern ribbon snake	Thamnophis sauritis
Northern black racer	Coluber constrictor
Northern spring peeper	Hyla crucifer
Fowler's toad	Bufo woodhousei fowleri

3.6.7 Rare Species and Critical Habitats

Based on a review of the New York Natural Heritage files by the NYSDEC Wildlife Resources Center, there are no rare species or critical habitats known to occur on or adjacent to the Sonia Road Landfill Site. In addition, except for occasional transient individuals, no federally listed or proposed endangered or threatened species exist within a two mile radius of the site according to the U.S. Department of the Interior, Fish and Wildlife Service. Table 3-7 provides a list of all federally listed and proposed threatened or endangered species in New York State.

3.6.8 Biological Associations Found in the Project Vicinity

The area surrounding the site within a 2.5-mile radius is basically the same as previously described. Lands to the east and south are developed residential properties. Lands to the west and north are largely developed industrial properties. The only additional habitats observed which are not present on the Sonia Road Landfill include cultivated lawns and some forested wetlands associated with Sampawams Creek headwaters. An association of cover types with common dominant species is presented in Table 3-8. The biological associations observed are common for this area.

3.6.9 Observations of Stress Potentially Related to Site Contaminants

As described in Section 3.1.1.5, visibly stressed habitat has been found in two areas of the landfill: one being approximately 150 square feet in area and the other area being 600 square feet in area. The locations of the areas of stressed vegetation are indicated on Figure 3-12. The ground surface is completely devoid of vegetation over a rectangular area which changes abruptly to common reed ranging from four to six feet tall. Black locust is also just outside the unvegetated zone. The surface appears to be fine grained soil intermixed with a tar-like compound. This tar-like substance was observed to increase fluidity during the heat of the day. The soil was fully

Table 3-7

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES IN NEW YORK STATE

Common Name	Scientific Name	Status	Distribution
Fishes			
Sturgeon, shortnose	Asipenser brevirostrum	E	Hudson River and other Atlantic coastal rivers
Reptiles			
Turtle, bog	Clemmys muhlenbergii	PT	Albany, Columbia, Dutchess, Genesee, Orange, Oswego, Putnam, Seneca, Ulster, Wayne, and Westchester Counties
Turtle, green	Chelonia mydas	T	Oceanic summer visitor coastal waters
Turtle, hawksbill	Eretmochelys imbricata	E	Oceanic summer visitor coastal waters
Turtle, leatherback	Dermochelys coriacea	E	Oceanic summer visitor coastal waters
Turtle, loggerhead	Caretta caretta	T	Oceanic summer visitor coastal waters
Turtle, Atlantic ridley	Lepidochelys kempii	E	Oceanic summer visitor coastal waters
Birds			
Eagle, bald	Haliaeetus leucocephalus	T	Entire state
Falcon, peregrine	Falco peregrinus	E	Entire state - re-establishment to former breeding range in progress
Plover, piping	Charadrius melodus	E	Great Lakes Watershed
		T	Remainder of coastal New York
Tern, roseate	Sterna dougallii dougallii	E	Southeastern coastal portions of state

Table 3-7 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES IN NEW YORK STATE

Common Name	Scientific Name	Status	Distribution
Mammals			
Bat, Indiana	Myotis sodalis	E	Entire state
Cougar, eastern	Felis concolor cougar	E	Entire state - probably extinct
Whale, blue	Balaenoptera musculus	E	Oceanic
Whale, finback	Balaenoptera physalus	E	Oceanic
Whale, humpback	Megaptera novaeangliae	E	Oceanic
Whale, right	Eubalaena glacialis	E	Oceanic
Whale, sei	Balaenoptera borealis	E	Oceanic
Whale, sperm	Physeter catodon	E	Oceanic
Mollusks			
Snail, Chittenango ovate amber	Succinea chittenangoensis	T	Madison County
Mussel, dwarf wedge	Alasmidonta heterodon	E	Orange County - lower Neversink River
Butterflies			
Butterfly, Karner blue	Lycaeides melissa samuelis	E	Albany, Saratoga, Warren, and Schenectady Counties
Plants			
Monkshood, northern wild	Aconitum noveboracense	T	Ulster, Sullivan, and Delaware Counties
Pogonia, small whorled	Isotria medeoloides	T	Entire state
Swamp pink	Helonias bullata	T	Staten Island - presumed extirpated
Gerardia, sandplain	Agalinis acuta	E	Nassau and Suffolk Counties
Fern, American hart's-tongue	Asplenium scolopendrium var. Americana	T	Onondaga and Madison Counties

Table 3-7 (continued)

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES IN NEW YORK STATE

Common Name	Scientific Name	Status	Distribution
Orchid, eastern prairie fringed	Platanthera leucophea	T	Not relocated in New York
Bulrush, northeastern	Scirpus ancistrochaetus	E	Not relocated in New York
Roseroot, Leedy's	Sedum integrifolium ssp. Leedyi	T	West shore of Seneca Lake
Amaranth, seabeach	Amaranthus pumilus	T	Atlantic coastal plain beaches
Goldenrod, Houghton's	Solidago houghtonii	T	Genesee County

Table 3-8

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FLORAL AND FAUNAL ASSOCIATIONS OBSERVED
WITHIN 2.5 MILES OF THE SONIA ROAD LANDFILL

Species	Grassland/ Field	Forested/ Grassland/ Field	Forested	Field/ Wet Area	Stressed Habitat	Cultivated Lawn	Forested Wetland
Plants							
Common ragweed	X	X					
Daisy	X	X					
Crown vetch	X	X		X			
Fescue						X	
Goldenrod	X	X		X			
Forsythia		X				X	
Virginia creeper		X	X			X	X
Multiflora rose	X	X		X			
Red maple			X			X	X
Flowering Dogwood		X	X			X	
White pine		X	X			X	
Black locust		X	X			X	
Animals							
Gray Squirrel		X	X			X	X
Mice/voles/shrews	X	X	X	X		X	X
Canada Goose				X			X
Hawks	X	X	X	X			
Finches		X	X			X	X
Sparrows	X	X	X			X	X
Box Turtle	X	X	X				X
Northern spring peeper				X			X
Eastern garter snake	X	X		X			

compacted but gave the under foot feel of walking on tires. This soil response was only located in the unvegetated area.

3.6.10 Habitat Values of Vegetative Zones Within the Project Site

The assessment of habitat value provides for assessments of primary functions such as food chain production, specialized habitat and hydrologic interactions. As part of the analysis, cultural values concerning recreation, aesthetics or other special features must be taken into consideration.

The information gathered during the remedial investigation can provide for a hierarchy of habitat values for the cover types found at the Sonia Road Landfill site. It should be noted that this approach is highly subjective. Those functions assumed to be valuable in relative efficiency or importance are ranked as 3 (high), 2 (moderate) or 1 (low). Specific factors and brief descriptions which were utilized in the habitat value analysis of the site's qualitative evaluation are as follows:

- Nutrient Transport Function - Transport of nutrients in detrital-based food chains is strongly dependent on the hydrologic characteristics of the particular ecosystem. For example, wetlands located in lower lying areas export more detrital material than do the higher marsh areas infrequently affected by creek/river overflow. Similarly, detrital transport in the riverine systems is dependent on the river flow regime, especially during periods of peak discharge. In contrast, very little detrital material is exported from isolated ponds and marshes, except during periods of episodic overflow resulting from exceptionally high precipitation.

- Food Chain Support - This function refers to the secondary productivity values of consumer species that a particular ecosystem can support. Secondary productivity is an overall measure of the efficiency of the habitat in terms of nutrient to transfer higher trophic levels.

- Hydroperiod - This factor refers to the frequency of inundation either by river flow runoff or direct precipitation. Areas of good hydrologic linkage help maintain a regular interchange of nutrients and other materials necessary to support diverse flora and fauna.

- Elevational Location - From the above, it is apparent that hydrologic relationships will progressively deteriorate as the depth of flooding decreases. The weakest hydrologic linkages exist in those areas physically isolated from other areas in the system.

- Cultural Evaluation - This particular factor is difficult to assess in detail because of the number of socio-economic considerations which may be involved. Hence, the evaluation in relation to local residential, commercial, or industrial development is largely left to the professional judgment of the project personnel on a specific case-by-case basis.

- Recreation - Recreation is a vital personal and social need which provides opportunity for self-expression, physical exercise, and a change of pace from normal or routine activities. Outdoor recreation is a major leisure activity and is growing in national importance with a trend towards a higher standard of living. A significant portion of the total recreational output is water based or water related. As such, greater weight is given to those types of habitats.

- Socio-Economic - This factor pertains to benefits which can be attributed directly to renewable resources, recreational enjoyment, or other features associated with a particular habitat.

- Aesthetics - Selected types of habitats are distinctive landscape features which can please the aesthetic sense through the intrinsic appreciation of natural beauty. Wetlands, or any other type of natural landscape, can also be offensive if their features have been adversely modified by incompatible human activities. Aesthetic value can be largely determined by the degree of visual diversity and contrast between the physical elements, such as landforms, water bodies, vegetation types and land use types.

- Food Chain Production - This factor determines the growth of vegetation in a habitat and influences the populations and secondary productivity of animals that feed on the plants, or that feed at high trophic levels in the community.

- Primary Productivity - Primary productivity is a measure of the stored food potential of the vegetation in excess of that used by the plants in metabolism. This determination provides an overall measure of the energy input directly available to the consumer species. It should be noted that the possible range of productivity values, both within and between particular environments, is extremely variable and dependent on a number of local conditions. For the present analysis, literature values for primary productivity as a function of biomass were utilized.

- Water Purification Factor - Through a variety of physical, biological, and chemical processes, some habitats function to naturally purify water by removing organic and mineral particulate matter from runoff and/or rivers and streams. For example, wetlands may be significant in minimizing some of the harmful effects of pollutants introduced into natural ecological systems by the activities of man. Thus, wetlands, especially when part of riverine or estuarine systems, can be an integral part of water quality and pollution control objectives.

Based upon the above factors, a qualitative analysis of the habitat value of the vegetative communities on the Sonia Road Landfill is presented in Table 3-9. Based upon these results, the habitats are essentially similar with the exception of the stressed habitat which is of extremely low value. None of the habitats have remarkable properties that distinguish them as highly productive areas. As indicated by the average score for each habitat, except for the area of stressed vegetation, which is of extremely low value, the remaining habitats are rated low to moderate in value. The Forested/Grassland/Field habitat scored slightly higher mainly because of the habitat diversity which is typically more biologically beneficial than monotypic habitat types. Depending on the final use of this area, aesthetic and recreational potential can be increased if contamination exposure is rendered a non-concern.

Table 3-9

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
QUALITATIVE HABITAT VALUE ANALYSIS
WITHIN THE SONIA ROAD LANDFILL

Evaluation Factor	Grassland/ Field	Forested/ Grassland/ Field	Forested	Field/ Wet Area	Stressed Habitat
Food Chain Production	2	2	2	2	1
Primary Productivity	2	2	1	1	1
Nutrient Transport	1	1	1	1	1
Food Chain Support	2	2	2	2	1
Hydroperiod	1	1	1	2	1
Elevational Location	1	1	1	1	1
Cultural Location	1	1	1	1	1
Recreation	1	2	2	1	1
Socio-Economic	1	1	1	1	1
Aesthetics	2	2	2	2	1
Water Purification Factor	2	2	2	2	1
Totals	***16***	***17***	***16***	***16***	***11***
Average Value	***1.5***	***1.6***	***1.5***	***1.5***	***1.0***

4.0 NATURE AND EXTENT OF CONTAMINATION

The purpose of this section is to present the analytical results of samples collected during the remedial investigation and provide a discussion of the results in comparison to standards, criteria and guidelines for the Sonia Road Landfill, as well as to identify the nature, source(s) and location of contamination at and in the vicinity of the site.

4.1 Identification of Standards, Criteria and Guidelines

This section provides a presentation of the standards, criteria and guidelines (SCGs) which will be used to determine the significance of contamination detected at the Sonia Road Landfill and provide a preliminary evaluation of the potential threat to human health and the environment. These SCGs will be used to screen the analytical results to identify media, study area location(s) and contaminants of concern. Exceedance of the SCGs does not imply that remediation is required, but that further consideration of the identified media, areas and contaminants of concern will need to be addressed in a Baseline Risk Assessment. The risk assessment will determine if migration pathways leading from the media and areas of concern will significantly impact potential receptors and necessitate remedial action. Provided below is a description of the SCGs for the Sonia Road Landfill as a function of media.

Soil

For review and interpretation of surface and subsurface soil analytical results, the SCGs selected for the Sonia Road Landfill site are the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) 4046 - Determination of Soil Cleanup Objectives and Cleanup Levels, dated January 1994 (see Appendix P). These Soil Cleanup Objectives have been developed by NYSDEC to determine potential impacts on human health and groundwater. In addition, the Toxic Characteristic Leaching Procedure (TCLP) concentration limits will be used to determine if the test results indicate that the soil or waste is characteristically hazardous.

Groundwater

For review and interpretation of groundwater analytical results, the SCGs selected for the Sonia Road Landfill site are the NYSDEC Technical and Operational Guidance Series (TOGS) - Ambient Water Quality Standards and Guidance Values, dated October 1993. These Standards and Guidance Values, which have been developed to provide ambient contaminant concentrations to protect New York groundwater and refer to the best classified usage of groundwater, are contained in the 6 NYCRR Part 703 groundwater regulations. The Class GA standards/guidelines, which apply to the use of groundwater as a potable water supply and are applicable to the groundwater in the area of the Sonia Road Landfill, will be utilized.

Ambient Air

For review and interpretation of soil vapor analytical results, NYSDEC Air Guide-1, dated October 1995, are used as guidance to determine potential impacts on human health. Although Air Guide-1 is not directly applicable to soil vapor, which is a nonpoint source, it provides short-term and annual guideline concentration limits for emissions of air contaminants to the atmosphere from process/point source emission sources, such as possible landfill gas vents and blower station stacks. In addition, for review and interpretation of methane gas results, the 6 NYCRR Part 360-2.15(e) solid waste regulations will be used to determine the need for remedial measures for the control of methane gas.

Surface Water and Sediment

Since no aquatic habitats are expected to be impacted by the Sonia Road Landfill, no surface water or sediment samples were collected as part of the remedial investigation. As a result, no SCGs for surface water or sediment are required/identified for the site.

4.2 Results of Site Characterization

4.2.1 Soil Vapor/Explosive Gas

As discussed in Section 2.0, thirty soil vapor screening points (SVP-1 through SVP-30) were installed at grid locations throughout the landfill and screened for total volatile organic compounds (VOCs) and percent lower explosive limit (LEL). Locations that exhibited elevated LEL measurements were also screened for percent methane, percent carbon dioxide and hydrogen sulfide. The screening was performed to evaluate the presence of these vapors/gases at the landfill and the need for landfill gas control.

The results of the initial screening are presented on Table 4-1. As shown, no elevated levels of total VOCs were detected and fourteen of the locations indicated the presence of explosive gas greater than 100% LEL. The fourteen locations exhibiting greater than 100% LEL were screened again, and the results of this second screening are presented on Table 4-2. The results indicate elevated concentrations of methane gas (greater than 5%) at a number of locations throughout the landfill, with most locations being in the eastern section. Figure 4-1 presents the location of the soil vapor monitoring points, the points that exhibit the presence of greater than 100% LEL and the percent methane at these locations.

In addition to the data obtained during this investigation, the Town has performed periodic methane monitoring in ten perimeter gas monitoring wells. Monitoring data is available from September 1992 through November 1994, with two additional rounds conducted in September 1996 and March 1997. The location of these wells are presented on Figure 4-1. The results of this monitoring indicate that methane was only detected in two of the monitoring wells, GMW-1 and GMW-4. Levels in GMW-1 ranged from 0% methane gas by volume to 8% methane gas by volume. Levels in GMW-4 ranged from 0% to 20% methane gas by volume. These results are also presented on Figure 4-1 and are provided in Appendix Q.

Table 4-1

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL VAPOR SCREENING RESULTS
MARCH 4-6, 1997

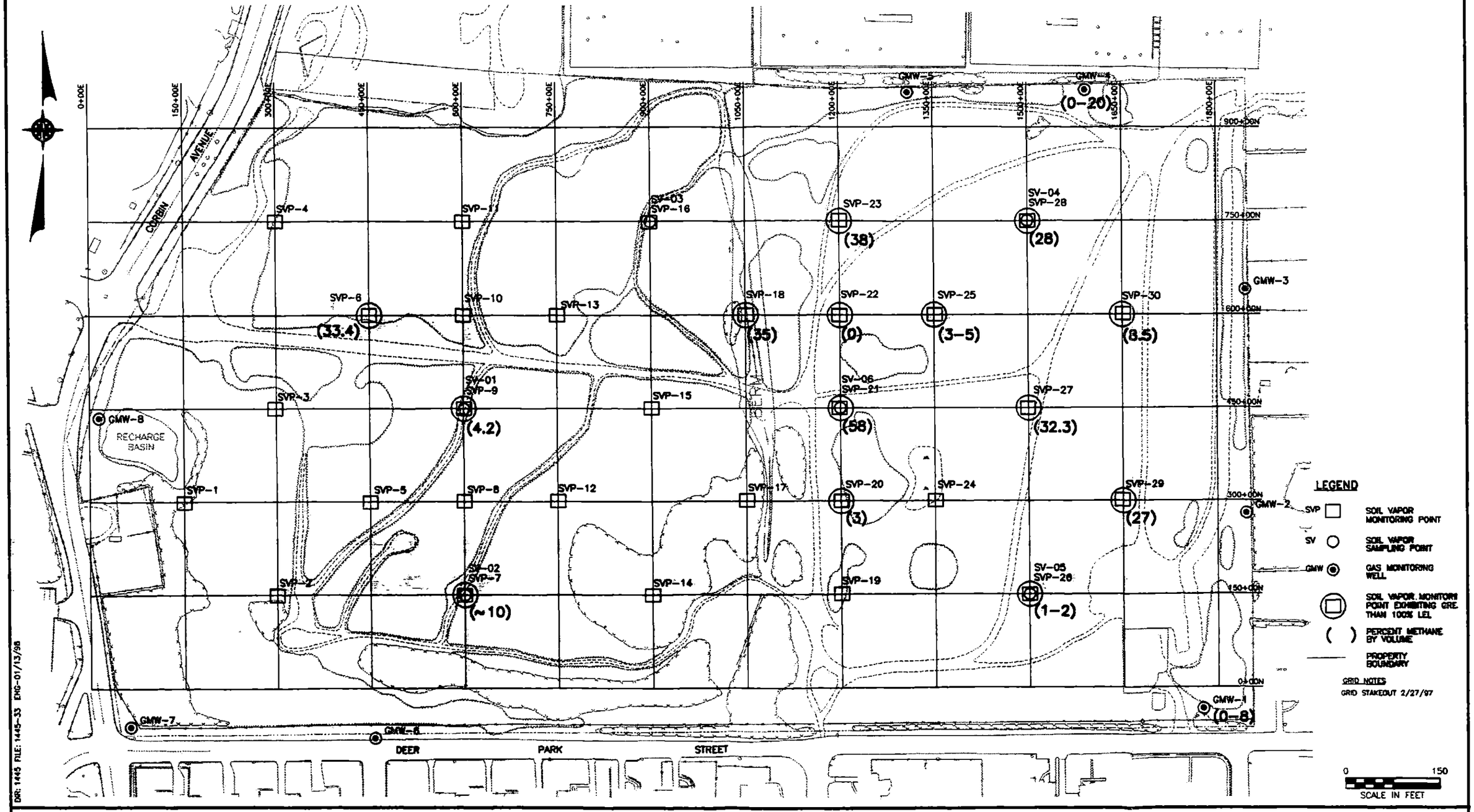
Sample Location	PID Readings (ppm)	Explosive Gas Readings % LEL
SVP-1	0	0
SVP-2	0	1
SVP-3	0	0
SVP-4	0	0
SVP-5	0	1
SVP-6	0	>100
SVP-7	0	>100
SVP-8	0	64
SVP-9	0	>100
SVP-10	0	0
SVP-11	0	0
SVP-12	0	1
SVP-13	0	1
SVP-14	0	1
SVP-15	0	72
SVP-16	0	2
SVP-17	0	2
SVP-18	0	>100
SVP-19	0	0
SVP-20	0	>100
SVP-21	0	>100
SVP-22	0	>100
SVP-23	0	>100
SVP-24	0	0
SVP-25	0	>100
SVP-26	0	>100
SVP-27	0	>100
SVP-28	0	>100
SVP-29	0	>100
SVP-30	0	>100

Table 4-2

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL VAPOR SCREENING RESULTS
MARCH 19, 1997

Sample Location	PID Readings (ppm)	Explosive Gas Readings (%LEL)	Methane Levels (%Vol.)	Carbon Dioxide Levels (%Vol.)	Hydrogen Sulfide Levels (ppm)
SVP-6	0	>100	33.4	9.6	0
SVP-7	0	>100	Approx. 10*	NA	0
SVP-9	0	>100	4.2	4.2	0
SVP-18	0	>100	35	25.3	19
SVP-20	0	>100	3	NA	0
SVP-21	0	>100	58	17	16
SVP-22	1.1	>100	0	0.2	0
SVP-23	0	>100	38	18	0
SVP-25	0	>100	3-5	0.4	0
SVP-26	0	>100	1-2	NA	0
SVP-27	0	>100	32.3	14	0
SVP-28	0	>100	28	4.4	0
SVP-29	0	>100	27	48.6	0
SVP-30	5.8	>100	8.5	8.2	0

*Water noted in sampling line; reading not steady.



SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Dvirka and Bartilucci
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SOIL VAPOR POINTS EXHIBITING ELEVATED LEVELS OF METHANE

FIGURE 4-1

Six of the soil vapor screening locations were selected for the collection of soil vapor samples for VOC analysis. The results of the analysis and comparison to Air Guide-1 annual guideline concentrations are presented on Table 4-3. As shown on this table, several of the samples indicated the presence of VOCs above the annual guideline concentrations. 1,1-Dichloroethene was detected above the guideline concentration in SV-02 and SV-03. However, 1,1-dichloroethene was also detected above the guideline concentration in the field blank. The blank concentration was greater than the concentration detected in SV-02, but less than that detected in SV-03, therefore only SV-03 is of environmental concern.

Benzene was detected above the guideline concentration in SV-06, but was also detected at a higher concentration in the field blank. However, since the blank result was obtained in the March samples and benzene was detected in the May resample (see Section 2.4), the result for SV-02 is considered to have been detected as an environmental contaminant. The only constituent detected above the guideline concentration, that was not detected in the field blank, is bromomethane in SV-06 at 7.77 ug/m^3. However, the result for bromomethane is only slightly above the guideline concentration of 5.0 ug/m^3.

Based on the results of screening and analysis of soil vapor samples for volatile organic compounds and comparison to SCGs, only low levels of VOCs are being emitted at the Sonia Road Landfill. These low levels of VOCs detected in subsurface soil would not be expected to impact ambient air and create a potential threat to human health or the environment.

As discussed above, methane gas was detected at elevated levels at a number of locations on-site. Methane measurements obtained as a result of previous monitoring of on-site gas monitoring wells indicate that there is this potential for off-site gas migration after capping. Methane gas is presently venting to the atmosphere on-site; however, with implementation of the Presumptive Remedy, there could be the potential for migration off-site. Therefore, landfill gas is a medium of concern. As a result, control of methane gas will be addressed as part of the Presumptive Remedy (capping) selected for the Sonia Road Landfill. The specific control technology will be evaluated and selected as part of the feasibility study and Presumptive Remedy Engineering Design Report.

TABLE 4-3
SONIA ROAD LANDFILL
PHASE I REMEDIAL INVESTIGATION
SOIL VAPOR SAMPLING RESULTS
VOLATILE ORGANIC COMPOUNDS

SITE IDENTIFICATION	SV-01	SV-02	SV-03	SV-04	SV-05	SV-06	–	Annual
SAMPLE IDENTIFICATION	SV-V-1	SV-V-2	SV-V-3	SV-V-4	SV-V-5	SV-V-6	SV-V-FB	Guideline
DATE OF COLLECTION	03/06/97	03/06/97	03/06/97	03/06/97	03/06/97	05/28/97	03/06/97	Concentration
QUANT. FACTOR	0.697	0.697	0.697	0.697	0.697	0.697	0.697	
VOLATILE ORGANICS	(ug/m³)*	(ug/m³)*	(ug/m³)*	(ug/m³)*	(ug/m³)*	(ug/m³)*	(ug/m³)*	ug/m³
Chloromethane	U	U	U	U	U	U	U	770.0
Bromomethane	U	U	U	U	U	7.77 JB	U	5.0
Vinyl Chloride	U	U	U	U	U	U	U	0.02
Chloroethane	U	U	U	U	U	7.91 J	U	13,000.0
Methylene Chloride	U	U	10.42	U	U	U	U	27.0
Carbon Disulfide	U	U	U	U	U	2.18 J	U	10.0
1,1-Dichloroethene	U	2.38 J	23.79	U	U	U	2.78 J	0.02
1,1-Dichloroethane	U	U	U	U	U	U	U	500.0
1,2-Dichloroethene (trans)	U	U	U	U	U	U	U	360.0
1,2-Dichloroethene (cis)	U	U	U	U	U	U	U	1,900.0
Chloroform	U	U	U	U	U	U	U	0.04
1,2-Dichloroethane	U	U	U	U	U	U	U	0.039
1,1,1-Trichloroethane	U	U	U	U	U	U	U	1,000.0
Carbon Tetrachloride	U	U	U	U	U	U	U	0.07
Bromodichloromethane	U	U	U	U	U	U	U	0.02
1,2-Dichloropropane	U	U	U	U	U	U	U	0.15
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	20.0
Trichloroethene	U	U	U	U	U	U	U	0.45
Dibromochloromethane	U	U	U	U	U	U	U	0.1
1,1,2-Trichloroethane	U	U	U	U	U	U	U	0.06
Benzene	U	U	U	U	U	1.6 J	6.39 JB	0.12
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	20.0
Bromoform	U	U	U	U	U	U	U	0.9
Tetrachloroethene	U	U	U	U	U	U	U	1.2
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	0.02
Toluene	U	U	3.77 J	1.51 J	U	U	U	400.0
Chlorobenzene	U	U	U	U	U	U	U	20.0
Ethylbenzene	U	U	0.87 J	U	U	U	U	1,000.0
Styrene	U	U	1.28 J	U	U	U	U	1,000.0
m&p-Xylene	U	U	3.91 J	U	U	U	U	300.0
o-Xylene	U	U	U	U	U	U	U	700.0

Qualifiers:
U: Compound analyzed for but not detected.
B: Compound detected in the method blank.
J: Compound found at level below CRDL, value estimated.

Notes:
* : Laboratory reported concentration in nL/L. Values in ug/m³ calculated at a pressure of 1 atm and a temperature of 25 °C.
□: Value exceeds AGC value.

4.2.2 Surface Soil

Seven surface soil samples were collected and analyzed for target compound list (TCL) +30 organic parameters, target analyte list (TAL) metals and cyanide during the remedial investigation. Three of the surface soil samples were collected off-site and four samples were collected on-site. One of the three off-site samples, SS-01, was collected in the industrial area to the north of the landfill and the remaining two off-site samples, SS-02 and SS-03, were collected in the residential area to the south of the landfill. The four on-site samples were collected from four locations based upon the grid established for the site. The locations of the samples are presented in Section 2.0.

The purpose of the surface soil sampling was to evaluate the quality of the on-site surface soil. In order to evaluate on-site soil quality, the results of the sample analyses were compared to NYSDEC Recommended Soil Cleanup Objectives. The results of the on-site surface soil samples were also compared to the off-site results. The analytical results for the surface soil samples in comparison to the soil cleanup objectives are presented in Tables 4-4 through 4-7. A summary of the constituents detected above the soil cleanup objectives is presented in Table 4-8.

Low levels of VOCs were detected in four of the surface soil samples; however, none of the levels detected were above the soil cleanup objectives.

Six of the seven surface soil samples indicated the presence of semivolatile organic compounds (SVOCs) above the soil cleanup objectives. Benzo(a)pyrene was detected above the cleanup objective of 61 ug/kg in five of the surface soil samples (two off-site and three on-site samples). Levels ranged from 62 ug/kg to 150 ug/kg. Two of the on-site samples, SS-04 and SS-06, and one off-site sample, SS-03, also indicated the presence of dibenzo(a,h)anthracene above the soil cleanup objective of 14 ug/kg. Levels ranged from 29 ug/kg to 45 ug/kg. Benzo(a)pyrene and dibenzo(a,h)anthracene are polycyclic aromatic hydrocarbons (PAHs) which are typically associated with incomplete combustion and are found in asphalt, cinder, coal and

Table 4-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE ID	NYSDEC SOIL	SS-S-1(0-2)	SS-S-2(0-2)	SS-S-3(0-2)	SS-S-4(0-2)	SS-S-5(0-2)
	DATE	CLEANUP	02/26/97	02/26/97	02/26/97	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00	0.00	0.00	0.00
Chloromethane			11 U	13 U	13 U	16 U	12 U
Vinyl Chloride		200	11 U	13 U	13 U	16 U	12 U
Bromomethane			11 U	13 U	13 U	16 U	12 U
Chloroethane		1900	11 U	13 U	13 U	16 U	12 U
1,1-Dichloroethene		400	11 U	13 U	13 U	16 U	12 U
Carbon Disulfide		2700	11 U	13 U	13 U	16 U	12 U
Acetone		200	26 B	18 B	19 B	16 U	12 U
Methylene Chloride		100	11 U	13 U	13 U	16 U	12 U
1,2-Dichloroethene (total)		300	11 U	13 U	13 U	16 U	12 U
1,1-Dichloroethane		200	11 U	13 U	13 U	16 U	12 U
Chloroform		300	11 U	13 U	13 U	16 U	12 U
1,2-Dichloroethane		100	11 U	13 U	13 U	16 U	12 U
2-Butanone		300	11 U	13 U	13 U	16 U	12 U
1,1,1-Trichloroethane		800	11 U	13 U	13 U	16 U	12 U
Carbon Tetrachloride		600	11 U	13 U	13 U	16 U	12 U
Trichloroethene		700	11 U	13 U	13 U	16 U	12 U
Benzene		60	11 U	13 U	13 U	16 U	12 U
1,2-Dichloropropane			11 U	13 U	13 U	16 U	12 U
Bromodichloromethane			11 U	13 U	13 U	16 U	12 U
cis-1,3-Dichloropropene			11 U	13 U	13 U	16 U	12 U
trans-1,3-Dichloropropene			11 U	13 U	13 U	16 U	12 U
1,1,2-Trichloroethane			11 U	13 U	13 U	16 U	12 U
Dibromochloromethane			11 U	13 U	13 U	16 U	12 U
Bromoform			11 U	13 U	13 U	16 U	12 U
4-Methyl-2-pentanone		1000	11 U	13 U	13 U	16 U	12 U
Toluene		1500	11 U	13 U	13 U	16 U	12 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE / SAMPLE ID / DATE / DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	SS-01 SS-S-1(0-2) 02/26/97 0.00	SS-02 SS-S-2(0-2) 02/26/97 0.00	SS-03 SS-S-3(0-2) 02/26/97 0.00	SS-04 SS-S-4(0-2) 02/27/97 0.00	SS-05 SS-S-5(0-2) 02/27/97 0.00
Tetrachloroethene		1400	11 U	(.9)	13 U	16 U	12 U
2-Hexanone			11 U	13 U	13 U	16 U	12 U
Chlorobenzene		1700	11 U	13 U	13 U	16 U	12 U
Ethylbenzene		5500	11 U	13 U	13 U	16 U	12 U
Xylene (total)		1200	(2)	13 U	13 U	16 U	12 U
Styrene			11 U	13 U	13 U	16 U	12 U
1,1,2,2-Tetrachloroethane		600	11 U	13 U	13 U	16 U	12 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-06	SS-07
	SAMPLE ID	NYSDEC SOIL	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	CLEANUP	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00
Chloromethane			14 U	12 U
Vinyl Chloride		200	14 U	12 U
Bromomethane			14 U	12 U
Chloroethane		1900	14 U	12 U
1,1-Dichloroethene		400	14 U	12 U
Carbon Disulfide		2700	14 U	12 U
Acetone		200	22 B	18 B
Methylene Chloride		100	14 U	12 U
1,2-Dichloroethene (total)		300	14 U	12 U
1,1-Dichloroethane		200	14 U	12 U
Chloroform		300	14 U	12 U
1,2-Dichloroethane		100	14 U	12 U
2-Butanone		300	14 U	12 U
1,1,1-Trichloroethane		800	14 U	12 U
Carbon Tetrachloride		600	14 U	12 U
Trichloroethene		700	14 U	12 U
Benzene		60	14 U	12 U
1,2-Dichloropropane			14 U	12 U
Bromodichloromethane			14 U	12 U
cis-1,3-Dichloropropene			14 U	12 U
trans-1,3-Dichloropropene			14 U	12 U
1,1,2-Trichloroethane			14 U	12 U
Dibromochloromethane			14 U	12 U
Bromoform			14 U	12 U
4-Methyl-2-pentanone		1000	14 U	12 U
Toluene		1500	14 U	(11)

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-4

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-06	SS-07
	SAMPLE ID	NYSDEC SOIL	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	CLEANUP	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00
Tetrachloroethene		1400	(.8)	12 U
2-Hexanone			14 U	12 U
Chlorobenzene		1700	14 U	12 U
Ethylbenzene		5500	14 U	(3)
Xylene (total)		1200	14 U	14
Styrene			14 U	12 U
1,1,2,2-Tetrachloroethane		600	14 U	12 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
( ) = Less than Reporting Limit
U: Constituent analyzed for but not detected
B: Compound found in the blank as well as the sample

Table 4-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID / DATE / DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	SS-01 SS-S-1(0-2) 02/26/97 0.00	SS-02 SS-S-2(0-2) 02/26/97 0.00	SS-03 SS-S-3(0-2) 02/26/97 0.00	SS-04 SS-S-4(0-2) 02/27/97 0.00	SS-05 SS-S-5(0-2) 02/27/97 0.00
Phenol		30	9500 U	410 U	440 U	530 U	380 U
Bis(2-chloroethyl)ether			9500 U	410 U	440 U	530 U	380 U
2-Chlorophenol		800	9500 U	410 U	440 U	530 U	380 U
1,3-Dichlorobenzene		1600	9500 U	410 U	440 U	530 U	380 U
1,4-Dichlorobenzene		8500	9500 U	410 U	440 U	530 U	380 U
1,2-Dichlorobenzene		7900	9500 U	410 U	440 U	530 U	380 U
2-Methylphenol		100	9500 U	410 U	440 U	530 U	380 U
2,2'-oxybis(1-chloropropane)			9500 U	410 U	440 U	530 U	380 U
4-Methylphenol		900	9500 U	410 U	440 U	530 U	380 U
N-Nitroso-di-n-propylamine			9500 U	410 U	440 U	530 U	380 U
Hexachloroethane			9500 U	410 U	440 U	530 U	380 U
Nitrobenzene		200	9500 U	410 U	440 U	530 U	380 U
Isophorone		4400	9500 U	410 U	440 U	530 U	380 U
2-Nitrophenol		330	9500 U	410 U	440 U	530 U	380 U
2,4-Dimethylphenol			9500 U	410 U	440 U	530 U	380 U
Bis(2-chloroethoxy)methane			9500 U	410 U	440 U	530 U	380 U
2,4-Dichlorophenol		400	9500 U	410 U	440 U	530 U	380 U
1,2,4-Trichlorobenzene		3400	9500 U	410 U	440 U	530 U	380 U
Naphthalene		13000	9500 U	410 U	440 U	530 U	380 U
4-Chloroaniline		220	9500 U	410 U	440 U	530 U	380 U
Hexachlorobutadiene			9500 U	410 U	440 U	530 U	380 U
4-Chloro-3-methylphenol		240	9500 U	410 U	440 U	530 U	380 U
2-Methylnaphthalene		36400	9500 U	(9)	440 U	530 U	380 U
Hexachlorocyclopentadiene			9500 U	410 U	440 U	530 U	380 U
2,4,6-Trichlorophenol			9500 U	410 U	440 U	530 U	380 U
2,4,5-Trichlorophenol		100	23000 U	990 U	1100 U	1300 U	910 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE ID	SS-S-1(0-2)	SS-S-2(0-2)	SS-S-3(0-2)	SS-S-4(0-2)	SS-S-5(0-2)
	DATE	02/26/97	02/26/97	02/26/97	02/27/97	02/27/97
	DEPTH (ft)	0.00	0.00	0.00	0.00	0.00
2-Chloronaphthalene		9500 U	410 U	440 U	530 U	380 U
2-Nitroaniline	430	23000 U	990 U	1100 U	1300 U	910 U
Dimethyl Phthalate	2000	9500 U	410 U	440 U	530 U	380 U
Acenaphthylene	41000	9500 U	410 U	440 U	530 U	380 U
2,6-Dinitrotoluene	1000	9500 U	410 U	440 U	530 U	380 U
3-Nitroaniline	500	23000 U	990 U	1100 U	1300 U	910 U
Acenaphthene	50000	9500 U	410 U	440 U	530 U	380 U
2,4-Dinitrophenol	200	23000 U	990 U	1100 U	1300 U	910 U
4-Nitrophenol	100	23000 U	990 U	1100 U	1300 U	910 U
Dibenzofuran	6200	9500 U	410 U	440 U	530 U	380 U
2,4-Dinitrotoluene		9500 U	410 U	440 U	530 U	380 U
Diethylphthalate	7100	9500 U	(14) B	(22) B	(25) B	(22)
Fluorene	50000	9500 U	410 U	440 U	530 U	380 U
4-chlorophenyl-phenylether		9500 U	410 U	440 U	530 U	380 U
4-Nitroaniline		23000 U	990 U	1100 U	1300 U	910 U
4,6-Dinitro-2-methylphenol		23000 U	990 U	1100 U	1300 U	910 U
N-Nitrosodiphenylamine		9500 U	410 U	440 U	530 U	380 U
Hexachlorobenzene	410	9500 U	410 U	440 U	530 U	380 U
Pentachlorophenol	1000	23000 U	990 U	1100 U	1300 U	910 U
Phenanthrene	50000	(550)	(66)	(120)	(100)	(34)
Anthracene	50000	(130)	(9)	(19)	(15)	(5)
Carbazole		9500 U	410 U	(15)	530 U	380 U
Di-n-butylphthalate	8100	9500 U	(19) B	(28) B	(39) B	(27) B
Fluoranthene	50000	(720)	(120)	(310)	(230)	(92)
Pyrene	50000	(830)	(110)	(270)	(190)	(93)
Butylbenzylphthalate	50000	9500 U	(29)	(35)	(38)	380 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
() = Less than Reporting Limit
U: Constituent analyzed for but not detected
B: Compound found in the blank as well as the sample

Table 4-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL	SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE ID	CLEANUP	SS-S-1(0-2)	SS-S-2(0-2)	SS-S-3(0-2)	SS-S-4(0-2)	SS-S-5(0-2)
	DATE	OBJECTIVES	02/26/97	02/26/97	02/26/97	02/27/97	02/27/97
	DEPTH (ft)		0.00	0.00	0.00	0.00	0.00
Benzo(a)anthracene		224	9500 U	(50)	(160)	(88)	(34)
3,3'-Dichlorobenzidine			9500 U	410 U	440 U	530 U	380 U
Chrysene		400	9500 U	(83)	(230)	(150)	(61)
Bis(2-ethylhexyl)phthalate		50000	[78000] B	(140) B	(140) B	1100 B	(139) B
Di-n-octylphthalate		50000	(290)	410 U	440 U	530 U	380 U
Benzo(b)fluoranthene		1100	9500 U	(72)	(180)	(120)	(67)
Benzo(k)fluoranthene		1100	9500 U	(52)	(130)	(120)	(46)
Benzo(a)pyrene		61	9500 U	[(62)]	[(140)]	[(120)]	[(71)]
Indeno(1,2,3-cd)pyrene		3200	9500 U	(69)	(140)	(140)	(69)
Dibenzo(a,h)anthracene		14	9500 U	410 U	[(45)]	[(41)]	380 U
Benzo(g,h,i)perylene		50000	9500 U	(68)	(62)	(250)	(148)

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( ) = Less than Reporting Limit [ ] = Greater than Action Level
U: Constituent analyzed for but not detected
B: Compound found in the blank as well as the sample

Table 4-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-06	SS-07
	SAMPLE ID	NYSDEC SOIL	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	CLEANUP	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00
Phenol		30	390 U	420 U
Bis(2-chloroethyl)ether			390 U	420 U
2-Chlorophenol		800	390 U	420 U
1,3-Dichlorobenzene		1600	390 U	420 U
1,4-Dichlorobenzene		8500	390 U	420 U
1,2-Dichlorobenzene		7900	390 U	420 U
2-Methylphenol		100	390 U	420 U
2,2'-oxybis(1-chloropropane)			390 U	420 U
4-Methylphenol		900	(200)	420 U
N-Nitroso-di-n-propylamine			390 U	420 U
Hexachloroethane			390 U	420 U
Nitrobenzene		200	390 U	420 U
Isophorone		4400	390 U	420 U
2-Nitrophenol		330	390 U	420 U
2,4-Dimethylphenol			390 U	420 U
Bis(2-chloroethoxy)methane			390 U	420 U
2,4-Dichlorophenol		400	390 U	420 U
1,2,4-Trichlorobenzene		3400	390 U	420 U
Naphthalene		13000	(6)	420 U
4-Chloroaniline		220	390 U	420 U
Hexachlorobutadiene			390 U	420 U
4-Chloro-3-methylphenol		240	390 U	420 U
2-Methylnaphthalene		36400	390 U	420 U
Hexachlorocyclopentadiene			390 U	420 U
2,4,6-Trichlorophenol			390 U	420 U
2,4,5-Trichlorophenol		100	940 U	1000 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-06	SS-07
	SAMPLE ID	NYSDEC SOIL	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	CLEANUP	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00
2-Chloronaphthalene			390 U	420 U
2-Nitroaniline		430	940 U	1000 U
Dimethyl Phthalate		2000	390 U	420 U
Acenaphthylene		41000	(9)	420 U
2,6-Dinitrotoluene		1000	390 U	420 U
3-Nitroaniline		500	940 U	1000 U
Acenaphthene		50000	390 U	420 U
2,4-Dinitrophenol		200	940 U	1000 U
4-Nitrophenol		100	940 U	1000 U
Dibenzofuran		6200	390 U	420 U
2,4-Dinitrotoluene			390 U	420 U
Diethylphthalate		7100	(14) B	(21) B
Fluorene		50000	390 U	420 U
4-chlorophenyl-phenylether			390 U	420 U
4-Nitroaniline			940 U	1000 U
4,6-Dinitro-2-methylphenol			940 U	1000 U
N-Nitrosodiphenylamine			390 U	420 U
Hexachlorobenzene		410	390 U	420 U
Pentachlorophenol		1000	940 U	1000 U
Phenanthrene		50000	(100)	(77)
Anthracene		50000	(21)	(12)
Carbazole			390 U	420 U
Di-n-butylphthalate		8100	(17) B	(40) B
Fluoranthene		50000	(260)	(180)
Pyrene		50000	(160)	(140)
Butylbenzylphthalate		50000	(17)	(40)

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( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-5

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-06	SS-07
	SAMPLE ID	NYSDEC SOIL	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	CLEANUP	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00
Benzo(a)anthracene		224	(120)	(79)
3,3'-Dichlorobenzidine			390 U	420 U
Chrysene		400	(170)	(120)
Bis(2-ethylhexyl)phthalate		50000	(130) B	(360) B
Di-n-octylphthalate		50000	390 U	420 U
Benzo(b)fluoranthene		1100	(170)	(110)
Benzo(k)fluoranthene		1100	(130)	(88)
Benzo(a)pyrene		61	[(150)]	[(100)]
Indeno(1,2,3-cd)pyrene		3200	(85)	(89)
Dibenzo(a,h)anthracene		14	[(29)]	420 U
Benzo(g,h,i)perylene		50000	(48)	(52)

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
( ) = Less than Reporting Limit [ ] = Greater than Action Level
U: Constituent analyzed for but not detected
B: Compound found in the blank as well as the sample

Table 4-6

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE ID	NYSDEC SOIL	SS-S-1(0-2)	SS-S-2(0-2)	SS-S-3(0-2)	SS-S-4(0-2)	SS-S-5(0-2)
	DATE	CLEANUP	02/26/97	02/26/97	02/26/97	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00	0.00	0.00	0.00
alpha-BHC		110	9.8 U	2.1 U	2.3 U	2.7 U	9.6 U
beta-BHC		200	9.8 U	2.1 U	2.3 U	2.7 U	9.6 U
delta-BHC		300	9.8 U	2.1 U	2.3 U	2.7 U	9.6 U
gamma-BHC (Lindane)		540	9.8 U	2.1 U	2.3 U	2.7 U	9.6 U
Heptachlor		100	9.8 U	2.1 U	2.3 U	2.7 U	(0.75)
Aldrin		41	(2.6)	2.1 U	2.3 U	2.7 U	9.6 U
Heptachlor Epoxide		20	(3.9)	(0.72)	(1.4)	(0.41)	(4.9)
Endosulfan I		900	(3.4)	2.1 U	2.3 U	2.7 U	9.6 U
Dieldrin		44	27	(0.92)	(1.7)	5.3 U	19 U
4,4'-DDE		2100	(17)	(2.0)	8.0	(4.3)	(16)
Endrin		100	(10)	(0.99)	(1.1)	(1.2)	19 U
Endosulfan II		900	(13)	4.1 U	4.4 U	5.3 U	(7.0)
4,4'-DDD		2900	(13)	(0.86)	(2.5)	(0.83)	(9.4)
Endosulfan Sulfate		1000	20	(0.12)	(0.96)	(0.14)	19 U
4,4'-DDT		2100	77	8.2	20	(5.0)	68
Methoxychlor			(5.6)	(0.35)	(1.5)	(1.2)	(2.1)
Endrin Ketone			(4.3)	(0.36)	(0.83)	(0.10)	19 U
Endrin Aldehyde			19 U	4.1 U	4.4 U	5.3 U	19 U
alpha-Chlordane			21	(1.3)	5.9	(2.0)	27
gamma-Chlordane			12	(0.55)	3.5	(0.51)	29
Toxaphene			980 U	210 U	230 U	270 U	960 U
Aroclor 1016			190 U	41 U	44 U	53 U	190 U
Aroclor 1221			380 U	83 U	89 U	110 U	380 U
Aroclor 1232			190 U	41 U	44 U	53 U	190 U
Aroclor 1242			190 U	41 U	44 U	53 U	190 U
Aroclor 1248			190 U	41 U	44 U	53 U	190 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

P: Diffence in conc. between the 2 columns was > 25%

Table 4-6

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL CLEANUP OBJECTIVES	SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE ID		SS-S-1(0-2)	SS-S-2(0-2)	SS-S-3(0-2)	SS-S-4(0-2)	SS-S-5(0-2)
	DATE		02/26/97	02/26/97	02/26/97	02/27/97	02/27/97
	DEPTH (ft)		0.00	0.00	0.00	0.00	0.00
Aroclor 1254			190 U	41 U	44 U	53 U	190 U
Aroclor 1260			190 U	41 U	44 U	53 U	190 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent analyzed for but not detected

P: Diffence in conc. between the 2 columns was > 25%

Table 4-6

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL	SS-06	SS-07
	SAMPLE ID	CLEANUP	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	OBJECTIVES	02/27/97	02/27/97
	DEPTH (ft)		0.00	0.00
alpha-BHC		110	10 U	11 U
beta-BHC		200	10 U	11 U
delta-BHC		300	10 U	11 U
gamma-BHC (Lindane)		540	10 U	11 U
Heptachlor		100	10 U	11 U
Aldrin		41	(1.1)	11 U
Heptachlor Epoxide		20	(2.0)	(7.4)
Endosulfan I		900	10 U	11 U
Dieldrin		44	(7.6)	(7.1)
4,4'-DDE		2100	52	(17)
Endrin		100	19 U	(4.4)
Endosulfan II		900	19 U	21 U
4,4'-DDD		2900	22	(19)
Endosulfan Sulfate		1000	(0.55)	21 U
4,4'-DDT		2100	96	82
Methoxychlor			(1.7)	110 U
Endrin Ketone			19 U	21 U
Endrin Aldehyde			19 U	21 U
alpha-Chlordane			(8.3)	26
gamma-Chlordane			(6.3)	17.
Toxaphene			1000 U	1100 U
Aroclor 1016			190 U	210 U
Aroclor 1221			390 U	420 U
Aroclor 1232			190 U	210 U
Aroclor 1242			190 U	210 U
Aroclor 1248			190 U	210 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit

U: Constituent analyzed for but not detected

P: Diffence in conc. between the 2 columns was > 25%

Table 4-6

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL	SS-06	SS-07
	SAMPLE ID	CLEANUP	SS-S-6(0-2)	SS-S-7(0-2)
	DATE	OBJECTIVES	02/27/97	02/27/97
	DEPTH (ft)		0.00	0.00
Aroclor 1254			190 U	210 U
Aroclor 1260			190 U	210 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U:Constituent analyzed for but not detected

P:Diffence in conc. between the 2 columns was > 25%

Table 4-7

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/kg)	SITE	NYSDEC SOIL	SS-01	SS-02	SS-03	SS-04	SS-05
	SAMPLE ID		SS-S-1(0-2)	SS-S-2(0-2)	SS-S-3(0-2)	SS-S-4(0-2)	SS-S-5(0-2)
	DATE	CLEANUP	02/26/97	02/26/97	02/26/97	02/27/97	02/27/97
	DEPTH (ft)	OBJECTIVES	0.00	0.00	0.00	0.00	0.00
Aluminum			4990	5580	7640	6530	4490
Antimony			0.84 U	1.0 U	0.85 U	0.91 U	0.85 U
Arsenic		7.5	[7.8]	3.3	3.9	3.4	2.4
Barium		300	53.0	19.0 B	25.8 B	24.3 B	14.9 B
Beryllium		0.16	[0.23] B	[0.29] B	0.21 U	[0.29] B	0.21 U
Cadmium		10	0.21 U	0.26 U	0.21 U	0.23 U	0.21 U
Calcium			6600	753 B	1280	1770	1520
Chromium		50	12.9	11.8	9.1	8.5	6.7
Cobalt		30	3.2 B	2.6 B	1.6 B	1.8 B	2.3 B
Copper		25	[25.7]	8.5	10.6	7.0	8.9
Iron		2000	[8840]	[7620]	[9110]	[9620]	[6390]
Lead		400	61.8	48.9	54.0	40.0	22.2
Magnesium			2350	913 B	702 B	636 B	1070
Manganese			645	103	62.5	75.4	62.8
Mercury		0.10	[0.31]	0.14 U	0.090 U	0.11 U	0.098 U
Nickel		13	8.2 B	7.6 B	5.7 B	4.6 B	4.8 B
Potassium			423 B	311 B	322 B	174 B	224 B
Selenium		2	0.99 B	1.1 B	1.4	1.3	1.0 B
Silver			0.42 B	0.26 U	0.21 U	0.23 U	0.21 U
Sodium			138 B	81.7 B	80.1 B	69.2 B	74.1 B
Thallium			0.42 U	0.52 U	0.42 U	0.46 U	0.43 U
Vanadium		150	14.6	15.4	20.9	16.2	11.0
Zinc		20	[116]	[48.9]	[62.4]	[39.4]	[31.8]
Cyanide			0.58 U	0.75 U	0.63 U	0.70 U	0.61 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Constituent analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-7

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/kg)	SITE	NYSDEC SOIL CLEANUP OBJECTIVES	SS-06	SS-07
	SAMPLE ID		SS-S-6(0-2)	SS-S-7(0-2)
	DATE		02/27/97	02/27/97
	DEPTH (ft)		0.00	0.00
Aluminum			4540	2690
Antimony			0.80 U	1.2 B
Arsenic		7.5	2.2	1.5 B
Barium		300	17.9 B	37.5 B
Beryllium		0.16	0.20 U	0.23 U
Cadmium		10	0.20 U	0.74 B
Calcium			1250	5320
Chromium		50	9.4	9.0
Cobalt		30	2.2 B	2.1 B
Copper		25	9.4	15.6
Iron		2000	[6380]	[5040]
Lead		400	119	69.4
Magnesium			989 B	2020
Manganese			76.1	145
Mercury		0.10	0.086 U	0.12 U
Nickel		13	5.2 B	10.8
Potassium			195 B	365 B
Selenium		2	1.1	0.89 B
Silver			0.20 U	0.23 U
Sodium			65.2 B	95.7 B
Thallium			0.40 U	0.46 U
Vanadium		150	10.6	8.9 B
Zinc		20	[44.8]	[101]
Cyanide			0.56 U	0.67 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U:Constituent analyzed for but not detected

B:Concentration is above IDL but below CRDL

Table 4-8

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL RESULTS EXCEEDING SOIL CLEANUP OBJECTIVES

Constituent	NYSDEC Soil Cleanup Objectives	SS-01 Off-Site	SS-02 Off-Site	SS-03 Off-Site	SS-04 On-Site	SS-05 On-Site	SS-06 On-Site	SS-07 On-Site
Semivolatile Organics (units in ug/kg)								
Bis(2-ethylhexyl)phthalate	50000	**78000 B**	140 B	140 B	1100 B	ND	130 B	360 B
Benzo(a)pyrene	61	ND	**62**	**140**	**120**	ND	**150**	**100**
Dibenzo(a,h)anthracene	14	ND	ND	**45**	**41**	ND	**29**	ND
Metals (units in mg/kg)								
Arsenic	7.5	7.5	3.3	3.9	3.4	2.4	2.2	1.5 B
Beryllium	0.16	**0.23 B**	**0.29 B**	ND	**0.29**	ND	ND	ND
Copper	25	**25.7**	8.5	10.6	7	8.9	9.4	15.6
Iron	2000	**8840**	**7620**	**9110**	**9620**	**6390**	**6380**	**5040**
Mercury	0.10	**0.31**	ND	ND	ND	ND	ND	ND
Zinc	20	**116**	**48.9**	**62.4**	**39.4**	**31.8**	**44.8**	**101**

Notes:

ND: Not detected.
B (Organics): Compound found in method blank as well as the sample.
B (Metals): Concentrations above instrument detection limit but below contract required detection limit.

tar and are ubiquitous in the environment. None of the samples exceeded the soil cleanup objective of 10,000 ug/kg for total carcinogenic SVOCs/PAHs.

Although benzo(a)pyrene and dibenz(a,h)anthracene were detected above the soil cleanup objectives in the on-site samples, similar and in some cases higher levels of these compounds were detected in the off-site samples indicating that the Sonia Road Landfill is not the source of these contaminants.

One off-site sample collected in the industrial area indicated the presence of an elevated level of bis(2-ethylhexyl)phthalate (78,000 ug/kg). This compound is used as a plasticizer, and it may have been that a piece of plastic was collected with the surface soil sample. Since this sample was collected off-site and none of the on-site samples indicated the presence of bis(2-ethylhexyl)phthalate above the soil cleanup objective, this exceedance is not considered to be significant relative to the Sonia Road Landfill.

Low levels of pesticides were detected in the on-site and off-site samples; however, none of the samples indicated the presence of pesticides above the soil cleanup objectives. Polychlorinated biphenyls (PCBs) were not detected in any of the surface soil samples.

Several metals were detected in the surface soil samples above the soil cleanup objectives. Iron and zinc were detected above the cleanup objective in all of the samples analyzed. The levels detected in the off-site samples were consistent with the levels detected in the on-site samples.

Beryllium was detected above the soil cleanup objective in two of the off-site surface soil samples (one in the industrial area and one in the residential area) and one on-site sample. The level of beryllium detected in the on-site sample is consistent with the off-site samples.

The other exceedances of the soil cleanup objectives were for copper and mercury which were detected in the off-site sample collected in the industrial area.

Based on these results, exceedances of soil cleanup objectives in surface soil are not the result of contamination caused by the Sonia Road Landfill. In addition, the exceedances were not significant, in particular, given the fact that the cleanup objectives are developed for unrestricted/residential land use, and the current and future use of the landfill site, as provided by the Town, will be for industrial purposes. The highest level of surface soil contamination was found in the industrial area to the north of the landfill.

Regarding a preliminary evaluation of the results, surface soil is not a medium of concern at the Sonia Road Landfill, in particular, since capping of the site is planned as a Presumptive Remedy. However, further evaluation of the surface soil results, and potential impacts on human health and the environment, will be addressed in the risk assessment.

4.2.3 Subsurface Soil (Soil Borings)

Four soil borings were constructed on-site during the remedial investigation and one sample was collected for analysis from each boring. Two of the samples collected (SB-1-1 and SB-4-1) were analyzed for TCL+30, TAL metals and cyanide, and two of the samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) parameters. The samples collected from SB-01 and SB-03 were collected from the waste material and above the water table, and the samples collected from SB-02 and SB-04 were collected from soil below the waste and within the water table. The results of the TCL +30, TAL metals and cyanide analyses, and comparison to soil cleanup objectives, are presented in Tables 4-9 to 4-12. The results of the TCLP analysis are presented in Table 4-13. A summary of the constituents that were detected above the cleanup objectives is presented on Table 4-14. The results of the TCLP analysis indicated that none of the constituents were detected.

Low levels of VOCs were detected in both the sample collected from SB-01 and SB-04; however none of the constituents detected were above the soil cleanup objective.

Table 4-9

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SB-01	SB-04
	SAMPLE ID	NYSDEC SOIL	SB-1-1	SB-4-1
	DATE	CLEANUP	08/01/97	08/15/97
	DEPTH (ft)	OBJECTIVES	21.00	45.00
Chloromethane			6.45 U	12 U
Vinyl Chloride		200	0.41 U	12 U
Bromomethane			0.51 U	12 U
Chloroethane		1900	0.64 U	12 U
1,1-Dichloroethene		400	0.64 U	12 U
Carbon Disulfide		2700	2 J	2 J
Acetone		200	15	9 J
Methylene Chloride		100	4 JB	3 JB
1,2-Dichloroethene (total)		300	10 J	12 U
1,1-Dichloroethane		200	0.46 U	12 U
Chloroform		300	1 J	12 U
1,2-Dichloroethane		100	0.45 U	12 U
2-Butanone		300	2.35 U	3 J
1,1,1-Trichloroethane		800	0.71 U	12 U
Carbon Tetrachloride		600	0.98 U	12 U
Trichloroethene		700	0.75 U	12 U
Benzene		60	0.5 U	12 U
1,2-Dichloropropane			0.79 U	12 U
Bromodichloromethane			0.55 U	12 U
cis-1,3-Dichloropropene			0.74 U	12 U
trans-1,3-Dichloropropene			0.51 U	12 U
1,1,2-Trichloroethane			0.79 U	12 U
Dibromochloromethane			0.39 U	12 U
Bromoform			1.05 U	12 U
4-Methyl-2-pentanone		1000	1.78 U	12 U
Toluene		1500	7 J	12 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent analyzed for but not detected

B: Compound found in method blank as well as sample

Table 4-9

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SB-01	SB-04
	SAMPLE ID	NYSDEC SOIL	SB-1-1	SB-4-1
	DATE	CLEANUP	08/01/97	08/15/97
	DEPTH (ft)	OBJECTIVES	21.00	45.00
Tetrachloroethene		1400	6 J	12 U
2-Hexanone			1.85 U	12 U
Chlorobenzene		1700	6 J	12 U
Ethylbenzene		5500	4 J	12 U
Xylene (total)		1200	8 J	12 U
Styrene			1.21 U	12 U
1,1,2,2-Tetrachloroethane		600	1.65 U	12 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent analyzed for but not detected

B: Compound found in method blank as well as sample

Table 4-10

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SB-01	SB-04
	SAMPLE ID	NYSDEC SOIL	SB-1-1	SB-4-1
	DATE	CLEANUP	08/01/97	08/15/97
	DEPTH (ft)	OBJECTIVES	21.00	45.00
Phenol		30	[3500] D	400 U
Bis(2-chloroethyl)ether			2100 U	400 U
2-Chlorophenol		800	2100 U	400 U
1,3-Dichlorobenzene		1600	2100 U	400 U
1,4-Dichlorobenzene		8500	1000 JD	400 U
1,2-Dichlorobenzene		7900	2100 U	400 U
2-Methylphenol		100	2100 U	400 U
2,2'-oxybis(1-chloropropane)			2100 U	400 U
4-Methylphenol		900	2100 U	400 U
N-Nitroso-di-n-propylamine			2100 U	400 U
Hexachloroethane			2100 U	400 U
Nitrobenzene		200	2100 U	400 U
Isophorone		4400	2100 U	400 U
2-Nitrophenol		330	2100 U	400 U
2,4-Dimethylphenol			2100 U	400 U
Bis(2-chloroethoxy)methane			2100 U	400 U
2,4-Dichlorophenol		400	2100 U	400 U
1,2,4-Trichlorobenzene		3400	2100 U	400 U
Naphthalene		13000	7600 D	400 U
4-Chloroaniline		220	2100 U	400 U
Hexachlorobutadiene			2100 U	400 U
4-Chloro-3-methylphenol		240	2100 U	400 U
2-Methylnaphthalene		36400	3600 D	98 J
Hexachlorocyclopentadiene			2100 U	400 U
2,4,6-Trichlorophenol			2100 U	400 U
2,4,5-Trichlorophenol		100	5200 U	990 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Constituent analyzed for but not detected
D: Result taken from reanalysis at a secondary dilution

Table 4-10

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL CLEANUP OBJECTIVES	SB-01	SB-04
	SAMPLE ID		SB-1-1	SB-4-1
	DATE		08/01/97	08/15/97
	DEPTH (ft)		21.00	45.00
2-Chloronaphthalene			2100 U	400 U
2-Nitroaniline		430	5200 U	990 U
Dimethyl Phthalate		2000	2100 U	400 U
Acenaphthylene		41000	2100 U	400 U
2,6-Dinitrotoluene		1000	2100 U	400 U
3-Nitroaniline		500	5200 U	990 U
Acenaphthene		50000	750 JD	120 J
2,4-Dinitrophenol		200	5200 U	990 U
4-Nitrophenol		100	5200 U	990 U
Dibenzofuran		6200	650 JD	61 J
2,4-Dinitrotoluene			2100 U	400 U
Diethylphthalate		7100	230 JD	400 U
Fluorene		50000	800 JD	140 J
4-chlorophenyl-phenylether			2100 U	400 U
4-Nitroaniline			5200 U	990 U
4,6-Dinitro-2-methylphenol			5200 U	990 U
N-Nitrosodiphenylamine			2100 U	150 J
Hexachlorobenzene		410	2100 U	400 U
Pentachlorophenol		1000	2100 U	990 U
Phenanthrene		50000	1300 JD	380 J
Anthracene		50000	540 JD	41 J
Carbazole			2100 U	400 U
Di-n-butylphthalate		8100	2100 U	130 J
Fluoranthene		50000	1500 JD	180 J
Pyrene		50000	1400 JD	92 J
Butylbenzylphthalate		50000	2100 U	42 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent analyzed for but not detected

D: Result taken from reanalysis at a secondary dilution

Table 4-10

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE		SB-01	SB-04
	SAMPLE ID	NYSDEC SOIL	SB-1-1	SB-4-1
	DATE	CLEANUP	08/01/97	08/15/97
	DEPTH (ft)	OBJECTIVES	21.00	45.00
Benzo(a)anthracene		224	[540] JD	400 U
3,3'-Dichlorobenzidine			2100 U	400 U
Chrysene		400	[660] JD	42 J
Bis(2-ethylhexyl)phthalate		50000	[370000] D	3700 D
Di-n-octylphthalate		50000	2100 U	400 U
Benzo(b)fluoranthene		1100	460 JD	400 U
Benzo(k)fluoranthene		1100	400 JD	400 U
Benzo(a)pyrene		61	[310] JD	400 U
Indeno(1,2,3-cd)pyrene		3200	2100 U	400 U
Dibenzo(a,h)anthracene		14	2100 U	400 U
Benzo(g,h,i)perylene		50000	270 JD	400 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[ ] = Greater than Action Level

U: Constituent analyzed for but not detected

D: Result taken from reanalysis at a secondary dilution

Table 4-11

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL	SB-01	SB-04
	SAMPLE ID	CLEANUP	SB-1-1	SB-4-1
	DATE	OBJECTIVES	08/01/97	08/15/97
	DEPTH (ft)		21.00	45.00
alpha-BHC		110	0.05 U	2.0 U
beta-BHC		200	8.2	2.0 U
delta-BHC		300	0.04 U	2.0 U
gamma-BHC (Lindane)		540	0.05 U	2.0 U
Heptachlor		100	0.08 U	2.0 U
Aldrin		41	0.08 U	2.0 U
Heptachlor Epoxide		20	[120] JD	1.1 JP
Endosulfan I		900	7.4 P	2.0 U
Dieldrin		44	0.16 U	3.9 U
4,4'-DDE		2100	210 C	3.9 U
Endrin		100	11	3.9 U
Endosulfan II		900	0.16 U	3.9 U
4,4'-DDD		2900	2100 D	47
Endosulfan Sulfate		1000	0.16 U	3.9 U
4,4'-DDT		2100	17 P	3.9 U
Methoxychlor			1.06 U	20 U
Endrin Ketone			4.5	3.9 U
Endrin Aldehyde			0.37 U	3.9 U
alpha-Chlordane			140 JD	2.6
gamma-Chlordane			110 JD	2.4 P
Toxaphene			10.78 U	200 U
Aroclor 1016			1.69 U	39 U
Aroclor 1221			3.38 U	80 U
Aroclor 1232			1.69 U	39 U
Aroclor 1242			7800 D	39 U
Aroclor 1248			1.69 U	39 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Constituent analyzed for but not detected
D: Result taken from reanalysis at a secondary dilution

Table 4-11

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/kg)	SITE	NYSDEC SOIL CLEANUP OBJECTIVES	SB-01	SB-04
	SAMPLE ID		SB-1-1	SB-4-1
	DATE		08/01/97	08/15/97
	DEPTH (ft)		21.00	45.00
Aroclor 1254			1.69 U	39 U
Aroclor 1260			1.16 U	39 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit NA=Not analyzed

U:Constituent analyzed for but not detected

D:Result taken from reanalysis at a secondary dilution

Table 4-12

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
METALS RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/kg)	SITE	NYSDEC SOIL CLEANUP OBJECTIVES	SB-01	SB-04
	SAMPLE ID		SB-1-1	SB-4-1
	DATE		08/01/97	08/15/97
	DEPTH (ft)		21.00	45.00
Aluminum			11000	640
Antimony			1.4 B	0.71 U
Arsenic		7.5	5.7	0.92 B
Barium		300	[1450]	3.8 B
Beryllium		0.16	[0.17] B	0.08 B
Cadmium		10	5.6	0.13 B
Calcium			8230	2200
Chromium		50	38.3	1.3 B
Cobalt		30	5.1 B	0.58 B
Copper		25	[74.9]	3.0 B
Iron		2000	[24100]	1510
Lead		400	274	9.7
Magnesium			1150 B	1180 B
Manganese			166	11.7
Mercury		0.10	[0.27]	0.06 U
Nickel		13	[43.5]	6.7 B
Potassium			446 B	76.9 B
Selenium		2	1.3	0.83 B
Silver			0.45 B	1.3 B
Sodium			118 B	34.6 B
Thallium			0.65 U	0.62 U
Vanadium		150	14.8	1.4 B
Zinc		20	[791]	[53.9]
Cyanide			0.62 U	0.59 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Constituent analyzed for but not detected

B: Concentration found above IDL but below CRDL

Table 4-13

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
TCLP RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	SB-02	SB-03
	SAMPLE ID	SB-2-1	SB-3-1
	DATE	08/01/97	07/31/97
Vinyl Chloride (TCLP)		1.4 U	1.4 U
1,1-Dichloroethene (TCLP)		1.4 U	1.4 U
Chloroform (TCLP)		1.4 U	1.4 U
1,2-Dichloroethane (TCLP)		1.4 U	1.4 U
2-Butanone (TCLP)		2.2 U	2.2 U
Carbon Tetrachloride (TCLP)		1.8 U	1.8 U
Trichloroethene (TCLP)		1.4 U	1.4 U
Benzene (TCLP)		1.4 U	1.4 U
Tetrachloroethene (TCLP)		1.8 U	1.8 U
Chlorobenzene (TCLP)		1.4 U	1.4 U
Pyridine (TCLP)		1.6 U	1.6 U
1,4-Dichlorobenzene (TCLP)		0.36 U	0.36 U
2-Methylphenol (TCLP)		0.735 U	0.735 U
4-Methylphenol (TCLP)		3.08 U	3 J
Hexachloroethane (TCLP)		0.845 U	0.845 U
Nitrobenzene (TCLP)		0.8 U	0.8 U
Hexachlorobutadiene (TCLP)		0.895 U	0.895 U
2,4,6-Trichlorophenol (TCLP)		0.305 U	0.305 U
2,4,5-Trichlorophenol (TCLP)		1.1 U	1.1 U
2,4-Dinitrotoluene (TCLP)		0.19 U	0.19 U
Hexachlorobenzene (TCLP)		0.275 U	0.275 U
Pentachlorophenol (TCLP)		0.355 U	0.355 U
gamma-BHC (Lindane) (TCLP)		0.0013 U	0.0013 U
Heptachlor (TCLP)		0.0018 U	0.0018 U
Heptachlor Epoxide (TCLP)		0.0063 U	0.0063 U
Endrin (TCLP)		0.0049 U	0.0049 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-13

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING SAMPLING
TCLP RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	SB-02	SB-03
	SAMPLE ID	SB-2-1	SB-3-1
	DATE	08/01/97	07/31/97
Methoxychlor (TCLP)		0.0255 U	0.0255 U
alpha-Chlordane (TCLP)		0.0017 U	0.0017 U
gamma-Chlordane (TCLP)		0.0014 U	0.0014 U
Toxaphene (TCLP)		0.2604 U	0.2604 U
Technical Chlordane (TCLP)		0.0371 U	0.0371 U
2,4-D (TCLP)		8 U	8 U
2,4,5-TP (TCLP)		2 U	2 U
Arsenic (TCLP)		4.7 B	3.3 B
Barium (TCLP)		248 B	318 B
Cadmium (TCLP)		1.3 B	4.5 B
Chromium (TCLP)		10.2 B	6.8 B
Lead (TCLP)		75.9 B	80.6 B
Mercury (TCLP)		0.1 U	0.1 U
Selenium (TCLP)		2.8 U	2.8 U
Silver (TCLP)		10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-14

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SOIL BORING RESULTS EXCEEDING
SOIL CLEANUP OBJECTIVES

Constituent	NYSDEC Soil Cleanup Objectives	SB-01	SB-04
Semivolatile Organics (units in ug/kg)			
Phenol	30	**3500**	ND
Benzo(a)anthracene	224	**540 JD**	ND
Chrysene	400	**660 JD**	42 J
Bis(2-ethylhexyl)phthalate	50,000	**370,000 D**	3,700 D
Benzo(a)pyrene	61	**310 JD**	ND
Pesticides (ug/kg)			
Heptachlor epoxide	20	**120 JD**	1.1 JP
Metals (units in mg/kg)			
Barium	300	**1,450**	3.8 B
Beryllium	0.16	**0.17 B**	0.08 B
Copper	25	**74.9**	3.0 B
Iron	2000	**24,100**	1,510
Mercury	0.10	**0.27**	ND
Nickel	13	**43.5**	6.7 B
Zinc	20	**791**	**53.9**

Concentrations in bold were detected above NYSDEC Soil Cleanup Objectives.

ND: not detected.

B: Concentrations above instrument detection limit but below contract required detection limit.

J: Found at a concentration below CRDL; concentration estimated.

D: Result taken from reanalysis at a secondary dilution.

P: The percent difference in the concentrations between the two columns was greater than 25%. Lower value was reported; value estimated.

Elevated levels of SVOCs were detected for a number of constituents in the sample of waste material collected from SB-01. Phenol, benzo(a)anthracene, chrysene, bis(2-ethylhexyl)phthalate and benzo(a)pyrene were all detected above soil cleanup objectives. No SVOCs were detected above the cleanup objective in SB-04 which was collected from beneath the waste.

As discussed with the surface soil sample results, the elevated level of bis(2-ethylhexyl)phthalate detected in sample SB-01 is likely a result of plastic material in the sample. This sample was described as waste material containing wood, tiles and brick. Although plastic was not noted specifically in the sample, plastic was noted in the sample collected immediately above. Elevated levels of the remaining SVOCs are the result of other waste materials.

Heptachlor epoxide was found above the soil cleanup objective in the sample collected from SB-01. Heptachlor epoxide is an oxidation product of heptachlor that forms once heptachlor is introduced to the environment. Heptachlor is a compound previously used to control termites and other insects. Although other pesticides and PCBs were detected in this sample and SB-04, none of the constituents were detected above the cleanup objectives.

Elevated levels of metals, including barium, beryllium, copper, iron, mercury, nickel and zinc, were detected in SB-01. These elevated levels of metals are attributable to waste materials. Zinc was the only constituent detected above the soil cleanup objective in the sample collected from SB-04.

Although elevated levels of PAHs, heptachlor epoxide and metals were detected in the sample collected from the waste, with the exception of iron, none of these compounds were detected at elevated levels in the groundwater as discussed in the following sections. All of the above represent typical chemical characteristics of municipal solid waste. In addition, the landfill will be capped as part of the Presumptive Remedy for the site which will eliminate the potential for contact with the waste and mitigate future potential leaching of the contaminants from waste to the groundwater. Not withstanding, although the waste material in the Sonia Road

Landfill should be considered a potential medium of concern under current conditions, this medium will be remediated through implementation of the selected Presumptive Remedy. However, further evaluation of this contamination, and potential impacts on human health and the environment, will be addressed in the risk assessment.

4.2.4 Groundwater (Hydropunch)

Seven Hydropunch screening points (H01 through H07) were installed along the southern property boundary at approximately 300 foot intervals in order to screen groundwater quality immediately downgradient of the landfill. Results of the Hydropunch screening were then used to establish the placement of permanent monitoring wells and selection of screen depths. Nine groundwater samples were collected from each of the screening points, except H05 where ten samples were collected. Each of the samples were analyzed for select VOCs based on the results of previous investigations, including 1,1-dichloroethene, 1,1-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, benzene, chlorobenzene and total xylenes with a portable gas chromatograph (GC). Seven split samples were collected and analyzed by a laboratory for confirmatory analysis. Comparison of the GC and laboratory split sample analysis is provided in Section 4.3 (Data Validation) and discussed below.

The analytical results of the Hydropunch screening and split samples in comparison to NYSDEC Class GA groundwater standards and guidelines are presented on Table 4-15 and Table 4-16, respectively.

Since the monitoring wells were to be installed as clusters comprising shallow, intermediate and deep wells in the Upper Glacial aquifer, the results of the Hydropunch screening are discussed to address shallow groundwater quality (water table to 47 feet below ground surface [bgs]), intermediate groundwater quality (53 feet to 87 feet bgs) and deep groundwater quality (93 feet to 107 feet bgs).

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H01	GW-H01	GW-H01	GW-H01	GW-H01
	SAMPLE ID	NYSDEC CLASS GA	GW-H1-01	GW-H1-02	GW-H1-03	GW-H1-04	GW-H1-05
	DATE	GROUNDWATER	08/22/97	08/22/97	08/22/97	08/22/97	08/22/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	[2.36] B	[4.5] B	[7.92] B	[2.39] B	[2.57] B
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	(0.05)	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			1 U	(0.18)	(0.44)	1 U	1 U
trans-1,2-Dichloroethene			1 U	1 U	1 U	(0.05)	(0.06)
1,1,1-Trichloroethane		5	1 U	1.2	1.4	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene		5	(0.06)	(0.08)	(0.1)	(0.26)	(0.20)
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

() = Less than Reporting Limit [] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H01	GW-H01	GW-H01	GW-H01	GW-H02
	SAMPLE ID	NYSDEC CLASS GA	GW-H1-06	GW-H1-07	GW-H1-08	GW-H1-09	GW-H2-01
	DATE	GROUNDWATER	08/25/97	08/25/97	08/25/97	08/25/97	08/27/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 2	Set 1	Set 1
Vinyl Chloride		2	(0.49) B	(0.12) B	1.05 B	(0.69) B	[5.53] B
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	(0.05)	(0.24)	(0.04)	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			1 U	1 U	1 U	1 U	(0.22)
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene		5	(0.08)	(0.15)	(0.05)	1 U	1 U
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit [ ] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H02	GW-H02	GW-H02	GW-H02	GW-H02
	SAMPLE ID	NYSDEC CLASS GA	GW-H2-02	GW-H2-03	GW-H2-04	GW-H2-05	GW-H2-06
	DATE	GROUNDWATER	08/27/97	08/27/97	08/27/97	08/27/97	08/28/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 2	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	1 U	(0.61) B	(0.34) B	(0.86) B
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			1 U	1 U	1 U	(0.74)	1 U
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	(0.48)	1 U	1 U	1 U	1 U
Tetrachloroethene		5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
( ) = Less than Reporting Limit
U: Compound analyzed for but not detected
B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H02	GW-H02	GW-H02	GW-H03	GW-H03
	SAMPLE ID	NYSDEC CLASS GA	GW-H2-07	GW-H2-08	GW-H2-09	GW-H3-01	GW-H3-02
	DATE	GROUNDWATER	08/28/97	08/28/97	09/18/97	09/02/97	09/02/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	(0.67) B	1.51 B	1 U	1 U
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	(0.08)	1 U	(0.04)	(0.13)	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			1 U	1 U	1 U	1 U	(0.31)
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	[20.4]	1 U	[30.33]	1 U	1 U
Benzene		0.7	1 U	1 U	[(0.85)]	1 U	1 U
Tetrachloroethene		5	(0.07)	1 U	(0.11)	1 U	1 U
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	[8.84]	1 U	1 U

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Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H03	GW-H03	GW-H03	GW-H03	GW-H03
	SAMPLE ID	NYSDEC CLASS GA	GW-H3-03	GW-H3-04	GW-H3-05	GW-H3-06	GW-H3-07
	DATE	GROUNDWATER	09/02/97	09/02/97	09/02/97	09/15/97	09/15/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	1 U	1 U	1 U	1 U
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	(0.12)	(0.16)	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			(0.25)	1.37	1.35	1 U	1 U
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	[5.86]	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene		5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

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Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H03	GW-H03	GW-H04	GW-H04	GW-H04
	SAMPLE ID	NYSDEC CLASS GA	GW-H3-08	GW-H3-09	GW-H4-01	GW-H4-02	GW-H4-03
	DATE	GROUNDWATER	09/15/97	09/17/97	09/05/97	09/05/97	09/05/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 2	Set 1	Set 1
Vinyl Chloride		2	(0.09) B	[4.07] B	1 U	1 U	(0.86) B
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	2.05	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	[38.84]	1 U	1 U
cis-1,2-Dichloroethene			1 U	1 U	(0.44)	1 U	(0.14)
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	[62.28]	1 U	1 U	1 U
Trichloroethene		5	[32.53]	1 U	1 U	1 U	1 U
Benzene		0.7	1 U	[50.14]	1 U	1 U	1 U
Tetrachloroethene		5	(0.06)	(0.05)	1 U	1 U	1 U
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit [ ] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H04	GW-H04	GW-H04	GW-H04	GW-H04
	SAMPLE ID	NYSDEC CLASS GA	GW-H4-04	GW-H4-05	GW-H4-06	GW-H4-07	GW-H4-08
	DATE	GROUNDWATER	09/05/97	09/19/97	09/19/97	09/19/97	09/19/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	(0.99) B	[4.16] B	1 U	1 U	[5.10] B
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			(0.74)	3.03	(0.20)	(0.55)	(0.34)
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	[50.15]	[33.96]	[22.13]	1 U
Benzene		0.7	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene		5	1 U	(0.06)	[5.97]	4.37	(0.69)
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit [ ] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H04	GW-H05	GW-H05	GW-H05	GW-H05
	SAMPLE ID	NYSDEC CLASS GA	GW-H4-09	GW-H5-01	GW-H5-02	GW-H5-03	GW-H5-04
	DATE	GROUNDWATER	09/22/97	09/08/97	09/08/97	09/08/97	09/08/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	1 U	1 U	1 U	1 U
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	[18.8]	[20.55]	[47.43]
cis-1,2-Dichloroethene			1.73	1 U	(0.5)	(0.41)	(0.71)
trans-1,2-Dichloroethene			2.29	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	[2.48]	1 U	1 U	1 U	(0.14)
Tetrachloroethene		5	(0.29)	(0.61)	(0.08)	1 U	1 U
Chlorobenzene		5	1 U	1.09	1.22	1.28	4.79
Xylene (total)		5	[10.94]	1 U	1 U	1 U	1 U

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Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H05	GW-H05	GW-H05	GW-H05	GW-H05
	SAMPLE ID	NYSDEC CLASS GA	GW-H5-05	GW-H5-06	GW-H5-07	GW-H5-08	GW-H5-09
	DATE	GROUNDWATER	09/15/97	09/15/97	09/16/97	09/16/97	09/16/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	1 U	(0.90) B	1 U	1 U
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	[16.14]	[16.61]	1 U	[34.04]
Benzene		0.7	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene		5	1 U	(0.29)	(0.11)	(0.04)	(0.10)
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
( ) = Less than Reporting Limit [ ] = Greater than Action Level
U: Compound analyzed for but not detected
B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H05	GW-H06	GW-H06	GW-H06	GW-H06
	SAMPLE ID	NYSDEC CLASS GA	GW-H5-10	GW-H6-01	GW-H6-02	GW-H6-03	GW-H6-04
	DATE	GROUNDWATER	09/17/97	09/09/97	09/09/97	09/09/97	09/09/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	[4.97] B	1 U	1 U	1 U	1 U
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	[138]	[76.91]	[33.69]	[57.88]
cis-1,2-Dichloroethene			1 U	1.82	1.66	(0.89)	1.32
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1.47	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	1 U	(0.17)	1 U	1 U	1 U
Tetrachloroethene		5	1 U	1 U	(0.23)	(0.09)	(0.13)
Chlorobenzene		5	1 U	(0.83)	1.52	1.12	1.36
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit [ ] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H06	GW-H06	GW-H06	GW-H06	GW-H06
	SAMPLE ID	NYSDEC CLASS GA	GW-H6-05	GW-H6-06	GW-H6-07	GW-H6-08	GW-H6-09
	DATE	GROUNDWATER	09/22/97	09/22/97	09/22/97	09/22/97	09/22/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	1 U	1 U	1 U	1 U
Chloroethane		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene			(0.27)	(0.34)	(0.11)	(0.35)	1 U
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	(0.05)
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene		5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene		5	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
( ) = Less than Reporting Limit
U: Compound analyzed for but not detected
B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H07	GW-H07	GW-H07	GW-H07	GW-H07
	SAMPLE ID	NYSDEC CLASS GA	GW-H7-01	GW-H7-02	GW-H7-03	GW-H7-04	GW-H7-05
	DATE	GROUNDWATER	09/10/97	09/10/97	09/10/97	09/10/97	09/18/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	1 U	1 U	1 U	(0.83) B	1 U
Chloroethane		5	1 U	[161.1]	[205]	1 U	[122.6]
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	[25.08]	[906.40]	[448]	[317.90]	[201]
cis-1,2-Dichloroethene			1.22	3.15	12.49	1.37	4.42
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	1 U	1 U	1 U	1 U
Benzene		0.7	[1.7]	[1.97]	1 U	1 U	1 U
Tetrachloroethene		5	(0.13)	(0.16)	1 U	1 U	(0.08)
Chlorobenzene		5	1.95	(0.84)	1 U	1 U	1 U
Xylene (total)		5	1 U	1 U	1 U	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit [ ] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-15

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
PORTABLE GC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE		GW-H07	GW-H07	GW-H07	GW-H07
	SAMPLE ID	NYSDEC CLASS GA	GW-H7-06	GW-H7-07	GW-H7-08	GW-H7-09
	DATE	GROUNDWATER	09/18/97	09/18/97	09/18/97	09/18/97
	RESULT TYPE	STDS/GUIDANCE	Set 1	Set 1	Set 1	Set 1
Vinyl Chloride		2	[2.37] B	1 U	[3.4] B	[19.44] B
Chloroethane		5	1 U	[188.30]	1 U	[230.50]
1,1-Dichloroethene		5	1 U	1 U	1 U	1 U
1,1-Dichloroethane		5	[443.40]	[7509.00]	1 U	[65.21]
cis-1,2-Dichloroethene			1.74	8.76	(0.31)	1.43
trans-1,2-Dichloroethene			1 U	1 U	1 U	1 U
1,1,1-Trichloroethane		5	1 U	1 U	1 U	1 U
Trichloroethene		5	1 U	[50.08]	1 U	1 U
Benzene		0.7	1 U	(0.39)	1 U	1 U
Tetrachloroethene		5	1 U	(0.51)	1 U	(0.11)
Chlorobenzene		5	1 U	2.18	1 U	1 U
Xylene (total)		5	1 U	1.06	1 U	1 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

( ) = Less than Reporting Limit [ ] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-16

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
CONFIRMATORY VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	GW-H01	GW-H02	GW-H04	GW-H04	GW-H05
	SAMPLE ID	GROUNDWATER	GW-H1-08	GW-H2-03	GW-H4-01	GW-H4-07	GW-H5-09
	DATE	STDS/GUIDANCE	08/25/97	08/27/97	09/05/97	09/19/97	09/16/97
Chloromethane		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Bromomethane		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Vinyl Chloride		2	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Chloroethane		5	1.4 U	4 J	[7] J	1.4 U	1.40 U
Methylene Chloride		5	1.4 U	2 J	2 J	1.4 U	1.40 U
Acetone		50	3.4 U	7 J	7 JB	3.4 U	3 J
Carbon Disulfide		50	1.2 U	1 J	8 J	1.2 U	1.20 U
1,1-Dichloroethene		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
1,1-Dichloroethane		5	1 J	1.4 U	1.20 U	1 J	1.20 U
1,2-Dichloroethene (total)		5	2.6 U	2.6 U	2.60 U	2.6 U	2.60 U
2-Butanone			2.2 U	4 J	4 J	2.2 U	1 J
Chloroform		7	1.4 U	1.4 U	1.40 U	1.4 U	1 J
1,2-Dichloroethane		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
1,1,1-Trichloroethane		5	1.8 U	1.8 U	1.80 U	1.8 U	1.80 U
Carbon Tetrachloride		5	1.8 U	1.8 U	1.80 U	1.8 U	1.80 U
Bromodichloromethane		50	1.8 U	1.8 U	1.80 U	1.8 U	1 J
1,2-Dichloropropane		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
cis-1,3-Dichloropropene		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Trichloroethene		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Benzene		0.7	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Dibromochloromethane		50	2.2 U	2.2 U	2.20 U	2.2 U	1 J
trans-1,3-Dichloropropene			1.8 U	1.8 U	1.80 U	1.8 U	1.80 U
1,1,2-Trichloroethane		5	2.0 U	1 J	2.00 U	2.0 U	2.00 U
Bromoform		50	1.8 U	2 J	1.80 U	1.8 U	1.80 U
4-Methyl-2-pentanone		5	1.4 U	4 J	1.40 U	1.4 U	1.40 U
2-Hexanone		50	1.4 U	3 J	1.40 U	1.4 U	1.40 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-16

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
CONFIRMATORY VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	GW-H01	GW-H02	GW-H04	GW-H04	GW-H05
	SAMPLE ID	GROUNDWATER	GW-H1-08	GW-H2-03	GW-H4-01	GW-H4-07	GW-H5-09
	DATE	STDS/GUIDANCE	08/25/97	08/27/97	09/05/97	09/19/97	09/16/97
Tetrachloroethene		5	1.8 U	1.8 U	1.40 U	[11]	1.40 U
1,1,2,2-Tetrachloroethane		5	2.2 U	2 J	2.20 U	2.2 U	2.20 U
Toluene		5	1.2 U	1.2 U	1.20 U	1.2 U	1.20 U
Chlorobenzene		5	1.4 U	1 J	1 J	1.4 U	1.40 U
Ethylbenzene		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Styrene		5	1.4 U	1.4 U	1.40 U	1.4 U	1.40 U
Xylene (total)		5	1.6 U	1 J	1.60 U	1.6 U	1.60 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-16

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
CONFIRMATORY VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	GW-H06	GW-H07
	SAMPLE ID	GROUNDWATER	GW-H6-05	GW-H7-03
	DATE	STDS/GUIDANCE	09/22/97	09/10/97
Chloromethane		5	1.4 U	1.40 U
Bromomethane		5	1.4 U	1.40 U
Vinyl Chloride		2	1.4 U	1.40 U
Chloroethane		5	1.4 U	[360] D
Methylene Chloride		5	1.4 U	1 JB
Acetone		50	4 J	14 B
Carbon Disulfide		50	1.2 U	4 J
1,1-Dichloroethene		5	1.4 U	1.40 U
1,1-Dichloroethane		5	1.4 U	1.20 U
1,2-Dichloroethene (total)		5	2.6 U	2.60 U
2-Butanone			2.2 U	4 JB
Chloroform		7	2 J	1.40 U
1,2-Dichloroethane		5	1.4 U	1.40 U
1,1,1-Trichloroethane		5	1.8 U	1.80 U
Carbon Tetrachloride		5	1.8 U	1.80 U
Bromodichloromethane		50	1.8 U	1.80 U
1,2-Dichloropropane		5	1.4 U	1.40 U
cis-1,3-Dichloropropene		5	1.4 U	1.40 U
Trichloroethene		5	1.4 U	1.40 U
Benzene		0.7	1.4 U	1.40 U
Dibromochloromethane		50	2.2 U	2.20 U
trans-1,3-Dichloropropene			1.8 U	1.80 U
1,1,2-Trichloroethane		5	2.0 U	2.00 U
Bromoform		50	1.8 U	1.80 U
4-Methyl-2-pentanone		5	[5] J	1.40 U
2-Hexanone		50	1.4 U	1.40 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Table 4-16

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH SAMPLING
CONFIRMATORY VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	GW-H06	GW-H07
	SAMPLE ID	GROUNDWATER	GW-H6-05	GW-H7-03
	DATE	STDS/GUIDANCE	09/22/97	09/10/97
Tetrachloroethene		5	1.8 U	1.40 U
1,1,2,2-Tetrachloroethane		5	2.2 U	2.20 U
Toluene		5	1.2 U	1.20 U
Chlorobenzene		5	1.4 U	2 J
Ethylbenzene		5	1.4 U	1.40 U
Styrene		5	1.4 U	1.40 U
Xylene (total)		5	1.6 U	1 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in blank as well as the sample

Further discussion of the impacts of the landfill on the shallow water quality is provided in the discussion of the groundwater monitoring well results in Section 4.2.5.

Intermediate Groundwater Quality

Three groundwater samples were collected from this zone (30 to 50 feet below the water table) in each of the Hydropunch locations. Levels of trichloroethene above the groundwater standard were detected in two samples collected from this zone in H04 and one sample collected from this zone in H05. Levels ranged from 16.14 ug/l to 50.15 ug/l. A level of tetrachloroethene above the standard (5.97 ug/l) was also detected in one of the samples collected from the intermediate zone in H04. 1,1,1 Trichloroethene was detected just above the standard in a sample from H03. Elevated levels of 1,1-dichloroethane (as high as 443.4 ug/l) were detected from the samples collected at location H07. None of the other samples collected from this zone indicated the presence of the select compounds above groundwater standards.

The shallow samples collected from this zone appear to be influenced by the landfill based on elevated levels of specific conductance. The deeper samples in this zone have much lower specific conductance levels (approaching 0.1 eV) and, therefore, are likely not being influenced by the landfill.

Further discussion of the impacts of the landfill on intermediate water quality is provided with the groundwater monitoring well results.

Deep Groundwater Quality

Three groundwater samples were collected from each of the Hydropunch locations in this zone (60 to 80 feet below the water table, just above the Gardiners Clay), except for H05 in which four samples were collected to a depth of 90 feet. This zone exhibited much higher levels of volatile organic chemical contamination than the shallower two zones. Levels of the select

compounds were detected above groundwater standards in at least two of the samples collected from each Hydropunch location in this zone with the exception of the H01 and H06 locations, which did not indicate the presence of elevated levels of the select compounds.

Trichloroethene was consistently detected at concentrations above groundwater standards in this zone with levels almost identical to the intermediate zone, ranging from 16.61 ug/l to 50 ug/l. In addition to trichloroethene, levels of benzene and xylene were also detected above standards in multiple samples from this zone, with levels ranging from 0.85 ug/l to 2.48 ug/l of benzene and 8.84 ug/l to 10.94 ug/l of xylene. Similar to the intermediate zone, elevated levels of 1,1-dichloroethane were detected in the deep samples collected from H07. The highest level of 1;1-dichloroethane detected at this location was 7,509 ug/l. Elevated levels of chloroethane, as high as 230.5 ug/l and cis-1,2-dichloroethene at 8.76 ug/l, were also detected in this zone at H07. One elevated level of 1,1,1 trichloroethane at 62.28 ug/l was detected at H03.

Similar to the intermediate depth samples, the specific conductance for the samples collected from this zone were significantly less than the levels detected in the shallow zone. Therefore, the groundwater in this zone is not likely influenced by the landfill. Further discussion of the impacts of the landfill on deep water quality is provided in the discussion of the groundwater monitoring well results below.

4.2.5 Groundwater (Monitoring Wells)

Two rounds of groundwater samples were collected from 36 monitoring wells screened in the Upper Glacial aquifer (31 new and 5 existing). Of the 36 wells, 12 wells are shallow, 12 wells are intermediate and 12 wells are deep. The shallow wells are screened in the water table between 3.85 and 42 feet below ground surface (bgs), the intermediate wells are screened between 50.8 and 84 feet bgs, and the deep wells are screened between 83.2 and 119 feet bgs, immediately above the Gardiners Clay. Similar to the Hydropunch results, the results of the samples collected from the groundwater monitoring wells are discussed to address each of the shallow, intermediate and deep zones in the Upper Glacial aquifer.

Each of the groundwater samples collected was analyzed for full TCL +30, TAL parameters and leachate parameters for the first round of sample collection and for TCL VOCs +10 for the second round. The analytical results and comparison to groundwater standards and guidelines for the first round are presented in Tables 4-17 to 4-21, and the analytical results and comparison to standards and guidelines for the second round are presented in Table 4-22. A summary of the results is presented in the following discussion and figures.

4.2.5.1 - Round 1 Groundwater Sampling

Shallow Groundwater Quality

The results of the analysis of the groundwater samples collected from the on-site shallow groundwater monitoring wells indicate the presence of levels of chloroethane in two shallow wells along the downgradient southern perimeter of the landfill that slightly exceed groundwater standards (see Figure 4-2). Groundwater monitoring well MW-05S indicated the presence of chloroethane at 9 ug/l and MW-04S indicated the presence of chloroethane at 8 ug/l.

Upgradient groundwater samples along the northern perimeter of the landfill indicated the presence of 1,1-dichloroethane above the groundwater standard. 1,1-Dichloroethane was detected at a level of 24 ug/l in MW-10S and 8 ug/l in MW-01S. Chloroethane is a breakdown product of 1,1-dichloroethane. An elevated level of benzene in MW-06S (at 4 ug/l) may be the result of contamination from the landfill. However, although detected immediately adjacent to the landfill, the shallow wells located further downgradient of the landfill did not indicate the presence on any VOCs above the standards.

A further upgradient sample from monitoring MW-11S indicated the presence of trichloroethene at 12 ug/l and 1,2-dichloroethene at 24 ug/l above groundwater standards. No other upgradient or downgradient shallow groundwater monitoring well indicated the presence of VOCs above the standards.

SVOCs and pesticides/PCBs were not detected above the groundwater standards in any of the shallow groundwater monitoring wells.

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Chloromethane		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bromomethane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Vinyl Chloride		2	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Chloroethane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Methylene Chloride		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Acetone		50	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Carbon Disulfide		50	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene		5	[5] J	2 J	0.6 U	0.6 U	0.6 U
1,1-Dichloroethane		5	[13]	[14]	[8] J	0.4 U	0.4 U
1,2-Dichloroethene (total)		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
2-Butanone			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane		5	[66]	[22]	0.6 U	0.6 U	0.6 U
Carbon Tetrachloride		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-Dichloropropene		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Benzene		0.7	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Dibromochloromethane		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform		50	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
4-Methyl-2-pentanone		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Tetrachloroethene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-Tetrachloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Ethylbenzene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Styrene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Xylene (total)		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Chloromethane		5	0.6 U	1.40 U	1.40 U	1.40 U	0.6 U
Bromomethane		5	0.4 U	1.40 U	1.40 U	1.40 U	0.4 U
Vinyl Chloride		2	0.6 U	1.40 U	1.40 U	1.40 U	0.6 U
Chloroethane		5	0.4 U	1.40 U	1.40 U	4 J	[11]
Methylene Chloride		5	0.4 U	1.40 U	1.40 U	1.40 U	0.4 U
Acetone		50	0.4 U	3.40 U	3.40 U	3.40 U	0.4 U
Carbon Disulfide		50	0.4 U	1.20 U	1.20 U	1.20 U	0.4 U
1,1-Dichloroethene		5	0.6 U	[9] J	[5] J	1.40 U	0.6 U
1,1-Dichloroethane		5	0.4 U	[10] J	[46]	1.20 U	0.4 U
1,2-Dichloroethene (total)		5	0.4 U	2.60 U	2.60 U	2.60 U	[7] J
2-Butanone			0.2 U	2.20 U	2.20 U	2.20 U	0.2 U
Chloroform		7	0.2 U	1.40 U	1.40 U	1.40 U	0.2 U
1,2-Dichloroethane		5	0.2 U	1.40 U	1.40 U	1.40 U	0.2 U
1,1,1-Trichloroethane		5	0.6 U	[61]	[12]	1.80 U	0.6 U
Carbon Tetrachloride		5	0.4 U	1.80 U	1.80 U	1.80 U	0.4 U
Bromodichloromethane		50	0.2 U	1.80 U	1.80 U	1.80 U	0.2 U
1,2-Dichloropropane		5	0.4 U	1.40 U	1.40 U	1.40 U	0.4 U
cis-1,3-Dichloropropene		5	0.2 U	1.40 U	1.40 U	1.40 U	0.2 U
Trichloroethene		5	0.4 U	1 J	3 J	1.40 U	0.4 U
Benzene		0.7	0.4 U	1.40 U	1.40 U	1.40 U	0.4 U
Dibromochloromethane		50	0.2 U	2.20 U	2.20 U	2.20 U	0.2 U
trans-1,3-Dichloropropene			0.2 U	1.80 U	1.80 U	1.80 U	0.2 U
1,1,2-Trichloroethane		5	0.2 U	2.00 U	2.00 U	2.00 U	0.2 U
Bromoform		50	0.6 U	1.80 U	1.80 U	1.80 U	0.6 U
4-Methyl-2-pentanone		5	0.2 U	1.40 U	1.40 U	1.40 U	0.2 U
2-Hexanone		50	0.2 U	1.40 U	1.40 U	1.40 U	0.2 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Tetrachloroethene		5	0.4 U	1.40 U	1.40 U	1.40 U	4 J
1,1,2,2-Tetrachloroethane		5	0.2 U	2.20 U	2.20 U	2.20 U	0.2 U
Toluene		5	0.4 U	1.20 U	1.20 U	1.20 U	0.4 U
Chlorobenzene		5	0.4 U	1.40 U	1.40 U	1.40 U	1 J
Ethylbenzene		5	0.4 U	1.40 U	1.40 U	1.40 U	0.4 U
Styrene		5	0.4 U	1.40 U	1.40 U	1.40 U	0.4 U
Xylene (total)		5	0.6 U	1.60 U	1.60 U	1.60 U	0.6 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Chloromethane		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bromomethane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Vinyl Chloride		2	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Chloroethane		5	[20]	[8] J	0.4 U	0.4 U	[9] J
Methylene Chloride		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Acetone		50	5 J	0.4 U	0.4 U	0.4 U	0.4 U
Carbon Disulfide		50	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
1,1-Dichloroethane		5	0.4 U	0.4 U	1 J	0.4 U	0.4 U
1,2-Dichloroethene (total)		5	0.4 U	0.4 U	0.4 U	4 J	0.4 U
2-Butanone			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Carbon Tetrachloride		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-Dichloropropene		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene		5	0.4 U	0.4 U	0.4 U	4 J	0.4 U
Benzene		0.7	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Dibromochloromethane		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform		50	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
4-Methyl-2-pentanone		5	3 J	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Tetrachloroethene		5	0.4 U	0.4 U	3 J	0.4 U	0.4 U
1,1,2,2-Tetrachloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene		5	1 J	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene		5	0.4 U	4 J	2 J	0.4 U	[5] J
Ethylbenzene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Styrene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Xylene (total)		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
Chloromethane		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Bromomethane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Vinyl Chloride		2	[19]	0.6 U	0.6 U	1 J	0.6 U
Chloroethane		5	0.4 U	0.4 U	1 J	0.4 U	0.4 U
Methylene Chloride		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Acetone		50	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Carbon Disulfide		50	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene		5	4 J	0.6 U	0.6 U	0.6 U	0.6 U
1,1-Dichloroethane		5	4 J	[5] J	0.4 U	0.4 U	0.4 U
1,2-Dichloroethene (total)		5	[480] D	0.4 U	0.4 U	[12]	0.4 U
2-Butanone			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane		5	[23]	4 J	0.6 U	0.6 U	0.6 U
Carbon Tetrachloride		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-Dichloropropene		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene		5	[45]	0.4 U	0.4 U	3 J	0.4 U
Benzene		0.7	0.4 U	0.4 U	[4] J	0.4 U	0.4 U
Dibromochloromethane		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform		50	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
4-Methyl-2-pentanone		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone		50	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

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[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
Tetrachloroethene		5	[1200] D	3 J	0.4 U	[21]	0.4 U
1,1,2,2-Tetrachloroethane		5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene		5	1 J	0.4 U	0.4 U	1 J	0.4 U
Chlorobenzene		5	0.4 U	0.4 U	4 J	0.4 U	0.4 U
Ethylbenzene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Styrene		5	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Xylene (total)		5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Compound analyzed for but not detected
D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
Chloromethane		5	0.6 U	1.40 U	1.40 U	1.40 U	1.40 U
Bromomethane		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Vinyl Chloride		2	0.6 U	1.40 U	1.40 U	1.40 U	1.40 U
Chloroethane		5	0.4 U	1.40 U	1.40 U	2 J	1.40 U
Methylene Chloride		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Acetone		50	0.4 U	3.40 U	3.40 U	3.40 U	2 J
Carbon Disulfide		50	0.4 U	1.20 U	1.20 U	1.20 U	1.20 U
1,1-Dichloroethene		5	0.6 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1-Dichloroethane		5	0.4 U	[8] J	[11]	[24]	1.20 U
1,2-Dichloroethene (total)		5	0.4 U	2.60 U	2.60 U	2.60 U	2.60 U
2-Butanone			0.2 U	2.20 U	2.20 U	2.20 U	2.20 U
Chloroform		7	0.2 U	1.40 U	1.40 U	1.40 U	1.40 U
1,2-Dichloroethane		5	0.2 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1,1-Trichloroethane		5	0.6 U	3 J	1.80 U	1.80 U	1.80 U
Carbon Tetrachloride		5	0.4 U	1.80 U	1.80 U	1.80 U	1.80 U
Bromodichloromethane		50	0.2 U	1.80 U	1.80 U	1.80 U	1.80 U
1,2-Dichloropropane		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
cis-1,3-Dichloropropene		5	0.2 U	1.40 U	1.40 U	1.40 U	1.40 U
Trichloroethene		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Benzene		0.7	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Dibromochloromethane		50	0.2 U	2.20 U	2.20 U	2.20 U	2.20 U
trans-1,3-Dichloropropene			0.2 U	1.80 U	1.80 U	1.80 U	1.80 U
1,1,2-Trichloroethane		5	0.2 U	2.00 U	2.00 U	2.00 U	2.00 U
Bromoform		50	0.6 U	1.80 U	1.80 U	1.80 U	1.80 U
4-Methyl-2-pentanone		5	0.2 U	1.40 U	1.40 U	1.40 U	1.40 U
2-Hexanone		50	0.2 U	1.40 U	1.40 U	1.40 U	1.40 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
Tetrachloroethene		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1,2,2-Tetrachloroethane		5	0.2 U	2.20 U	2.20 U	2.20 U	2.20 U
Toluene		5	0.4 U	1.20 U	1.20 U	1.20 U	1.20 U
Chlorobenzene		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Ethylbenzene		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Styrene		5	0.4 U	1.40 U	1.40 U	1.40 U	1.40 U
Xylene (total)		5	0.6 U	1.60 U	1.60 U	1.60 U	1.60 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Chloromethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Bromomethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Vinyl Chloride		2	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Chloroethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Methylene Chloride		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Acetone		50	3.40 U	3.40 U	3.40 U	3.40 U	3.40 U
Carbon Disulfide		50	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U
1,1-Dichloroethene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1-Dichloroethane		5	[7] J	3 J	1.20 U	1.20 U	1.20 U
1,2-Dichloroethene (total)		5	2.60 U	[24]	2.60 U	2.60 U	2.60 U
2-Butanone			2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Chloroform		7	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,2-Dichloroethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1,1-Trichloroethane		5	2 J	1.80 U	1.80 U	1 J	1.80 U
Carbon Tetrachloride		5	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
Bromodichloromethane		50	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
1,2-Dichloropropane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
cis-1,3-Dichloropropene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Trichloroethene		5	1.40 U	[12]	1.40 U	1.40 U	1.40 U
Benzene		0.7	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Dibromochloromethane		50	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
trans-1,3-Dichloropropene			1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
1,1,2-Trichloroethane		5	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Bromoform		50	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
4-Methyl-2-pentanone		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
2-Hexanone		50	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Compound analyzed for but not detected
D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Tetrachloroethene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1,2,2-Tetrachloroethane		5	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Toluene		5	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U
Chlorobenzene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Ethylbenzene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Styrene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Xylene (total)		5	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Chloromethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Bromomethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Vinyl Chloride		2	[2] J	[7] J	1.40 U	[14]	1.40 U
Chloroethane		5	3 J	1.40 U	1.40 U	[5] J	[8] J
Methylene Chloride		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Acetone		50	3.40 U	3.40 U	3.40 U	2 J	3.40 U
Carbon Disulfide		50	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U
1,1-Dichloroethene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1-Dichloroethane		5	4 J	4 J	1.20 U	1 J	1.20 U
1,2-Dichloroethene (total)		5	[31]	[73]	2.60 U	[21]	2.60 U
2-Butanone			2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Chloroform		7	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,2-Dichloroethane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
1,1,1-Trichloroethane		5	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
Carbon Tetrachloride		5	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
Bromodichloromethane		50	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
1,2-Dichloropropane		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
cis-1,3-Dichloropropene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Trichloroethene		5	1 J	4 J	1.40 U	1.40 U	1.40 U
Benzene		0.7	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Dibromochloromethane		50	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
trans-1,3-Dichloropropene			1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
1,1,2-Trichloroethane		5	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Bromoform		50	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
4-Methyl-2-pentanone		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
2-Hexanone		50	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Tetrachloroethene		5	1 J	[9] J	1.40 U	1.40 U	1.40 U
1,1,2,2-Tetrachloroethane		5	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Toluene		5	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U
Chlorobenzene		5	2 J	1.40 U	1.40 U	1 J	1.40 U
Ethylbenzene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Styrene		5	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Xylene (total)		5	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Compound analyzed for but not detected
D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Chloromethane		5	1.40 U
Bromomethane		5	1.40 U
Vinyl Chloride		2	1.40 U
Chloroethane		5	1.40 U
Methylene Chloride		5	1.40 U
Acetone		50	3.40 U
Carbon Disulfide		50	1.20 U
1,1-Dichloroethene		5	1.40 U
1,1-Dichloroethane		5	1.20 U
1,2-Dichloroethene (total)		5	2.60 U
2-Butanone			2.20 U
Chloroform		7	1.40 U
1,2-Dichloroethane		5	1.40 U
1,1,1-Trichloroethane		5	1.80 U
Carbon Tetrachloride		5	1.80 U
Bromodichloromethane		50	1.80 U
1,2-Dichloropropane		5	1.40 U
cis-1,3-Dichloropropene		5	1.40 U
Trichloroethene		5	1.40 U
Benzene		0.7	1.40 U
Dibromochloromethane		50	2.20 U
trans-1,3-Dichloropropene			1.80 U
1,1,2-Trichloroethane		5	2.00 U
Bromoform		50	1.80 U
4-Methyl-2-pentanone		5	1.40 U
2-Hexanone		50	1.40 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-17

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Tetrachloroethene		5	1.40 U
1,1,2,2-Tetrachloroethane		5	2.20 U
Toluene		5	1.20 U
Chlorobenzene		5	1.40 U
Ethylbenzene		5	1.40 U
Styrene		5	1.40 U
Xylene (total)		5	1.60 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

D: Result taken from the diluted run

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Phenol		1	0.685 U	0.685 U	0.685 U	0.685 U	0.685 U
Bis(2-chloroethyl)ether		1	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Chlorophenol		1	0.805 U	0.805 U	0.805 U	0.805 U	0.805 U
1,3-Dichlorobenzene		5	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Methylphenol		1	0.285 U	0.285 U	0.285 U	0.285 U	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U	1.22 U	1.22 U	1.22 U	1.22 U
4-Methylphenol		1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
N-Nitroso-di-n-propylamine			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U
Hexachloroethane		5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Nitrobenzene		5	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
Isophorone		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol		1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
2,4-Dimethylphenol		1	1.15 U	1.15 U	1.15 U	1.15 U	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4-Dichlorophenol		1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Naphthalene		10	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Chloroaniline		5	1.02 U	1.02 U	1.02 U	1.02 U	1.02 U
Hexachlorobutadiene		5	0.625 U	0.625 U	0.625 U	0.625 U	0.625 U
4-Chloro-3-methylphenol		1	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
2-Methylnaphthalene			0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Hexachlorocyclopentadiene		5	0.945 U	0.945 U	0.945 U	0.945 U	0.945 U
2,4,6-Trichlorophenol		1	0.815 U	0.815 U	0.815 U	0.815 U	0.815 U
2,4,5-Trichlorophenol		1	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
2-Chloronaphthalene		10	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Nitroaniline		5	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethylphthalate		50	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Acenaphthylene			0.235 U	0.235 U	0.235 U	0.235 U	0.235 U
2,6-Dinitrotoluene		5	0.465 U	0.465 U	0.465 U	0.465 U	0.465 U
3-Nitroaniline		5	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Acenaphthene		20	0.355 U	0.355 U	0.355 U	0.355 U	0.355 U
2,4-Dinitrophenol		1	2.155 U	2.155 U	2.155 U	2.155 U	2.155 U
4-Nitrophenol		1	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibenzofuran			0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2,4-Dinitrotoluene		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Diethylphthalate		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene		50	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
4-chlorophenyl-phenylether			0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
4-Nitroaniline		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U	1.215 U	1.215 U	1.215 U	1.215 U
N-Nitrosodiphenylamine		50	0.775 U	0.775 U	0.775 U	0.775 U	0.775 U
4-Bromophenyl Phenylether			0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Hexachlorobenzene		0.35	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pentachlorophenol		1	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenanthrene		50	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
Anthracene		50	0.435 U	0.435 U	0.435 U	0.435 U	0.435 U
Carbazole			0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Di-n-butyl Phthalate		50	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Fluoranthene		50	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Pyrene		50	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit NA=Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Butylbenzylphthalate		50	3.95 U	3.95 U	3.95 U	3.95 U	3.95 U
Benzo(a)anthracene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
3,3-Dichlorobenzidine		5	3.51 U	3.51 U	3.51 U	3.51 U	3.51 U
Chrysene		0.002	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Bis(2-ethylhexyl)phthalate		50	9 J	4 J	1 J	9 J	2 J
Di-n-octyl Phthalate		50	2.555 U	2.555 U	2.555 U	2.555 U	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U	1.39 U	1.39 U	1.39 U	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U	2.35 U	2.35 U	2.35 U	2.35 U
Benzo(a)pyrene		0	0.295 U	0.295 U	0.295 U	0.295 U	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Dibenzo(a,h)anthracene			0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Benzo(ghi)perylene			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Phenol		1	0.685 U	0.685 U	0.685 U	0.685 U	[4] J
Bis(2-chloroethyl)ether		1	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Chlorophenol		1	0.805 U	0.805 U	0.805 U	0.805 U	0.805 U
1,3-Dichlorobenzene		5	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Methylphenol		1	0.285 U	0.285 U	0.285 U	0.285 U	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U	1.22 U	1.22 U	1.22 U	1.22 U
4-Methylphenol		1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
N-Nitroso-di-n-propylamine			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U
Hexachloroethane		5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Nitrobenzene		5	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
Isophorone		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol		1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
2,4-Dimethylphenol		1	1.15 U	1.15 U	1.15 U	1.15 U	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4-Dichlorophenol		1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Naphthalene		10	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Chloroaniline		5	1.02 U	1.02 U	1.02 U	1.02 U	1.02 U
Hexachlorobutadiene		5	0.625 U	0.625 U	0.625 U	0.625 U	0.625 U
4-Chloro-3-methylphenol		1	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
2-Methylnaphthalene			0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Hexachlorocyclopentadiene		5	0.945 U	0.945 U	0.945 U	0.945 U	0.945 U
2,4,6-Trichlorophenol		1	0.815 U	0.815 U	0.815 U	0.815 U	0.815 U
2,4,5-Trichlorophenol		1	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
2-Chloronaphthalene		10	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Nitroaniline		5	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethylphthalate		50	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Acenaphthylene			0.235 U	0.235 U	0.235 U	0.235 U	0.235 U
2,6-Dinitrotoluene		5	0.465 U	0.465 U	0.465 U	0.465 U	0.465 U
3-Nitroaniline		5	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Acenaphthene		20	0.355 U	0.355 U	0.355 U	0.355 U	0.355 U
2,4-Dinitrophenol		1	2.155 U	2.155 U	2.155 U	2.155 U	2.155 U
4-Nitrophenol		1	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibenzofuran			0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2,4-Dinitrotoluene		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Diethylphthalate		50	2 J	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene		50	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
4-chlorophenyl-phenylether			0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
4-Nitroaniline		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U	1.215 U	1.215 U	1.215 U	1.215 U
N-Nitrosodiphenylamine		50	0.775 U	0.775 U	0.775 U	0.775 U	3 J
4-Bromophenyl Phenylether			0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Hexachlorobenzene		0.35	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pentachlorophenol		1	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenanthrene		50	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
Anthracene		50	0.435 U	0.435 U	0.435 U	0.435 U	0.435 U
Carbazole			0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Di-n-butyl Phthalate		50	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Fluoranthene		50	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Pyrene		50	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Butylbenzylphthalate		50	3.95 U	3.95 U	3.95 U	3.95 U	3.95 U
Benzo(a)anthracene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
3,3-Dichlorobenzidine		5	3.51 U	3.51 U	3.51 U	3.51 U	3.51 U
Chrysene		0.002	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Bis(2-ethylhexyl)phthalate		50	5 J	1 J	1 J	2.935 U	4 J
Di-n-octyl Phthalate		50	2.555 U	2.555 U	2.555 U	2.555 U	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U	1.39 U	1.39 U	1.39 U	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U	2.35 U	2.35 U	2.35 U	2.35 U
Benzo(a)pyrene		0	0.295 U	0.295 U	0.295 U	0.295 U	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Dibenzo(a,h)anthracene			0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Benzo(ghi)perylene			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Phenol		1	0.685 U	0.685 U	0.685 U	0.685 U	0.685 U
Bis(2-chloroethyl)ether		1	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Chlorophenol		1	0.805 U	0.805 U	0.805 U	0.805 U	0.805 U
1,3-Dichlorobenzene		5	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Methylphenol		1	0.285 U	0.285 U	0.285 U	0.285 U	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U	1.22 U	1.22 U	1.22 U	1.22 U
4-Methylphenol		1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
N-Nitroso-di-n-propylamine			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U
Hexachloroethane		5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Nitrobenzene		5	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
Isophorone		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol		1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
2,4-Dimethylphenol		1	1.15 U	1.15 U	1.15 U	1.15 U	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4-Dichlorophenol		1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Naphthalene		10	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Chloroaniline		5	1.02 U	1.02 U	1.02 U	1.02 U	1.02 U
Hexachlorobutadiene		5	0.625 U	0.625 U	0.625 U	0.625 U	0.625 U
4-Chloro-3-methylphenol		1	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
2-Methylnaphthalene			0.22 U	3 J	0.22 U	0.22 U	0.22 U
Hexachlorocyclopentadiene		5	0.945 U	0.945 U	0.945 U	0.945 U	0.945 U
2,4,6-Trichlorophenol		1	0.815 U	0.815 U	0.815 U	0.815 U	0.815 U
2,4,5-Trichlorophenol		1	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

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Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
2-Chloronaphthalene		10	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Nitroaniline		5	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethylphthalate		50	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Acenaphthylene			0.235 U	0.235 U	0.235 U	0.235 U	0.235 U
2,6-Dinitrotoluene		5	0.465 U	0.465 U	0.465 U	0.465 U	0.465 U
3-Nitroaniline		5	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Acenaphthene		20	0.355 U	3 U	0.355 U	0.355 U	3 U
2,4-Dinitrophenol		1	2.155 U	2.155 U	2.155 U	2.155 U	2.155 U
4-Nitrophenol		1	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibenzofuran			0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2,4-Dinitrotoluene		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Diethylphthalate		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene		50	0.36 U	2 J	0.36 U	0.36 U	2 J
4-chlorophenyl-phenylether			0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
4-Nitroaniline		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U	1.215 U	1.215 U	1.215 U	1.215 U
N-Nitrosodiphenylamine		50	2 J	7 J	0.775 U	0.775 U	4 J
4-Bromophenyl Phenylether			0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Hexachlorobenzene		0.35	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pentachlorophenol		1	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenanthrene		50	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
Anthracene		50	0.435 U	0.435 U	0.435 U	0.435 U	0.435 U
Carbazole			0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Di-n-butyl Phthalate		50	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Fluoranthene		50	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Pyrene		50	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Butylbenzylphthalate		50	3.95 U	3.95 U	3.95 U	3.95 U	3.95 U
Benzo(a)anthracene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
3,3-Dichlorobenzidine		5	3.51 U	3.51 U	3.51 U	3.51 U	3.51 U
Chrysene		0.002	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Bis(2-ethylhexyl)phthalate		50	41 J	2.935 U	2 J	7 J	2.935 U
Di-n-octyl Phthalate		50	2.555 U	2.555 U	2.555 U	2.555 U	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U	1.39 U	1.39 U	1.39 U	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U	2.35 U	2.35 U	2.35 U	2.35 U
Benzo(a)pyrene		0	0.295 U	0.295 U	0.295 U	0.295 U	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Dibenzo(a,h)anthracene			0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Benzo(ghi)perylene			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

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Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
Phenol		1	0.685 U	0.685 U	0.685 U	0.685 U	0.685 U
Bis(2-chloroethyl)ether		1	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Chlorophenol		1	0.805 U	0.805 U	0.805 U	0.805 U	0.805 U
1,3-Dichlorobenzene		5	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Methylphenol		1	0.285 U	0.285 U	0.285 U	0.285 U	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U	1.22 U	1.22 U	1.22 U	1.22 U
4-Methylphenol		1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
N-Nitroso-di-n-propylamine			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U
Hexachloroethane		5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Nitrobenzene		5	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
Isophorone		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol		1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
2,4-Dimethylphenol		1	1.15 U	1.15 U	1.15 U	1.15 U	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4-Dichlorophenol		1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Naphthalene		10	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Chloroaniline		5	1.02 U	1.02 U	1.02 U	1.02 U	1.02 U
Hexachlorobutadiene		5	0.625 U	0.625 U	0.625 U	0.625 U	0.625 U
4-Chloro-3-methylphenol		1	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
2-Methylnaphthalene			0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Hexachlorocyclopentadiene		5	0.945 U	0.945 U	0.945 U	0.945 U	0.945 U
2,4,6-Trichlorophenol		1	0.815 U	0.815 U	0.815 U	0.815 U	0.815 U
2,4,5-Trichlorophenol		1	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U

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Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
2-Chloronaphthalene		10	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Nitroaniline		5	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethylphthalate		50	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Acenaphthylene			0.235 U	0.235 U	0.235 U	0.235 U	0.235 U
2,6-Dinitrotoluene		5	0.465 U	0.465 U	0.465 U	0.465 U	0.465 U
3-Nitroaniline		5	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Acenaphthene		20	0.355 U	0.355 U	0.355 U	0.355 U	0.355 U
2,4-Dinitrophenol		1	2.155 U	2.155 U	2.155 U	2.155 U	2.155 U
4-Nitrophenol		1	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibenzofuran			0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2,4-Dinitrotoluene		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Diethylphthalate		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene		50	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
4-chlorophenyl-phenylether			0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
4-Nitroaniline		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U	1.215 U	1.215 U	1.215 U	1.215 U
N-Nitrosodiphenylamine		50	0.775 U	0.775 U	0.775 U	0.775 U	0.775 U
4-Bromophenyl Phenylether			0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Hexachlorobenzene		0.35	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pentachlorophenol		1	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenanthrene		50	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
Anthracene		50	0.435 U	0.435 U	0.435 U	0.435 U	0.435 U
Carbazole			0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Di-n-butyl Phthalate		50	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Fluoranthene		50	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Pyrene		50	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit NA = Not analyzed

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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
Butylbenzylphthalate		50	3.95 U	3.95 U	3.95 U	3.95 U	3.95 U
Benzo(a)anthracene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
3,3-Dichlorobenzidine		5	3.51 U	3.51 U	3.51 U	3.51 U	3.51 U
Chrysene		0.002	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Bis(2-ethylhexyl)phthalate		50	2.935 U	1 J	2 J	2.935 U	2.935 U
Di-n-octyl Phthalate		50	2.555 U	2.555 U	2.555 U	2.555 U	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U	1.39 U	1.39 U	1.39 U	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U	2.35 U	2.35 U	2.35 U	2.35 U
Benzo(a)pyrene		0	0.295 U	0.295 U	0.295 U	0.295 U	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Dibenzo(a,h)anthracene			0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Benzo(ghi)perylene			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

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Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Phenol		1	0.685 U	0.685 U	0.685 U	0.685 U	0.685 U
Bis(2-chloroethyl)ether		1	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Chlorophenol		1	0.805 U	0.805 U	0.805 U	0.805 U	0.805 U
1,3-Dichlorobenzene		5	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Methylphenol		1	0.285 U	0.285 U	0.285 U	0.285 U	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U	1.22 U	1.22 U	1.22 U	1.22 U
4-Methylphenol		1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
N-Nitroso-di-n-propylamine			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U
Hexachloroethane		5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Nitrobenzene		5	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
Isophorone		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol		1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
2,4-Dimethylphenol		1	1.15 U	1.15 U	1.15 U	1.15 U	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4-Dichlorophenol		1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Naphthalene		10	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Chloroaniline		5	1.02 U	1.02 U	1.02 U	1.02 U	1.02 U
Hexachlorobutadiene		5	0.625 U	0.625 U	0.625 U	0.625 U	0.625 U
4-Chloro-3-methylphenol		1	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
2-Methylnaphthalene			0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Hexachlorocyclopentadiene		5	0.945 U	0.945 U	0.945 U	0.945 U	0.945 U
2,4,6-Trichlorophenol		1	0.815 U	0.815 U	0.815 U	0.815 U	0.815 U
2,4,5-Trichlorophenol		1	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

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Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
2-Chloronaphthalene		10	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Nitroaniline		5	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethylphthalate		50	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Acenaphthylene			0.235 U	0.235 U	0.235 U	0.235 U	0.235 U
2,6-Dinitrotoluene		5	0.465 U	0.465 U	0.465 U	0.465 U	0.465 U
3-Nitroaniline		5	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Acenaphthene		20	0.355 U	0.355 U	0.355 U	0.355 U	0.355 U
2,4-Dinitrophenol		1	2.155 U	2.155 U	2.155 U	2.155 U	2.155 U
4-Nitrophenol		1	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibenzofuran			0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2,4-Dinitrotoluene		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Diethylphthalate		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene		50	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
4-chlorophenyl-phenylether			0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
4-Nitroaniline		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U	1.215 U	1.215 U	1.215 U	1.215 U
N-Nitrosodiphenylamine		50	0.775 U	0.775 U	0.775 U	0.775 U	0.775 U
4-Bromophenyl Phenylether			0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Hexachlorobenzene		0.35	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pentachlorophenol		1	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenanthrene		50	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
Anthracene		50	0.435 U	0.435 U	0.435 U	0.435 U	0.435 U
Carbazole			0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Di-n-butyl Phthalate		50	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Fluoranthene		50	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Pyrene		50	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit NA=Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Butylbenzylphthalate		50	3.95 U	3.95 U	3.95 U	3.95 U	3.95 U
Benzo(a)anthracene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
3,3-Dichlorobenzidine		5	3.51 U	3.51 U	3.51 U	3.51 U	3.51 U
Chrysene		0.002	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Bis(2-ethylhexyl)phthalate		50	2 J	2.935 U	3 J	3 J	2.935 U
Di-n-octyl Phthalate		50	2.555 U	2.555 U	2.555 U	2.555 U	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U	1.39 U	1.39 U	1.39 U	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U	2.35 U	2.35 U	2.35 U	2.35 U
Benzo(a)pyrene		0	0.295 U	0.295 U	0.295 U	0.295 U	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Dibenzo(a,h)anthracene			0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Benzo(ghi)perylene			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Phenol		1	0.685 U	0.685 U	0.685 U	0.685 U	0.685 U
Bis(2-chloroethyl)ether		1	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Chlorophenol		1	0.805 U	0.805 U	0.805 U	0.805 U	0.805 U
1,3-Dichlorobenzene		5	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
2-Methylphenol		1	0.285 U	0.285 U	0.285 U	0.285 U	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U	1.22 U	1.22 U	1.22 U	1.22 U
4-Methylphenol		1	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
N-Nitroso-di-n-propylamine			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U
Hexachloroethane		5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Nitrobenzene		5	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
Isophorone		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol		1	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
2,4-Dimethylphenol		1	1.15 U	1.15 U	1.15 U	1.15 U	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4-Dichlorophenol		1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Naphthalene		10	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
4-Chloroaniline		5	1.02 U	1.02 U	1.02 U	1.02 U	1.02 U
Hexachlorobutadiene		5	0.625 U	0.625 U	0.625 U	0.625 U	0.625 U
4-Chloro-3-methylphenol		1	0.375 U	0.375 U	0.375 U	0.375 U	0.375 U
2-Methylnaphthalene			0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Hexachlorocyclopentadiene		5	0.945 U	0.945 U	0.945 U	0.945 U	0.945 U
2,4,6-Trichlorophenol		1	0.815 U	0.815 U	0.815 U	0.815 U	0.815 U
2,4,5-Trichlorophenol		1	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

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Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
2-Chloronaphthalene		10	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Nitroaniline		5	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethylphthalate		50	0.275 U	0.275 U	0.275 U	0.275 U	0.275 U
Acenaphthylene			0.235 U	0.235 U	0.235 U	0.235 U	0.235 U
2,6-Dinitrotoluene		5	0.465 U	0.465 U	0.465 U	0.465 U	0.465 U
3-Nitroaniline		5	0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Acenaphthene		20	0.355 U	0.355 U	0.355 U	0.355 U	1 J
2,4-Dinitrophenol		1	2.155 U	2.155 U	2.155 U	2.155 U	2.155 U
4-Nitrophenol		1	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibenzofuran			0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2,4-Dinitrotoluene		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Diethylphthalate		50	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene		50	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
4-chlorophenyl-phenylether			0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
4-Nitroaniline		5	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U	1.215 U	1.215 U	1.215 U	1.215 U
N-Nitrosodiphenylamine		50	0.775 U	0.775 U	0.775 U	0.775 U	1 J
4-Bromophenyl Phenylether			0.605 U	0.605 U	0.605 U	0.605 U	0.605 U
Hexachlorobenzene		0.35	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pentachlorophenol		1	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenanthrene		50	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
Anthracene		50	0.435 U	0.435 U	0.435 U	0.435 U	0.435 U
Carbazole			0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Di-n-butyl Phthalate		50	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U
Fluoranthene		50	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Pyrene		50	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Butylbenzylphthalate		50	3.95 U	3.95 U	3.95 U	3.95 U	3.95 U
Benzo(a)anthracene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
3,3-Dichlorobenzidine		5	3.51 U	3.51 U	3.51 U	3.51 U	3.51 U
Chrysene		0.002	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Bis(2-ethylhexyl)phthalate		50	2.935 U	6 J	2.935 U	3 J	4 J
Di-n-octyl Phthalate		50	2.555 U	2.555 U	2.555 U	2.555 U	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U	1.39 U	1.39 U	1.39 U	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U	2.35 U	2.35 U	2.35 U	2.35 U
Benzo(a)pyrene		0	0.295 U	0.295 U	0.295 U	0.295 U	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Dibenzo(a,h)anthracene			0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Benzo(ghi)perylene			0.365 U	0.365 U	0.365 U	0.365 U	0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Phenol		1	0.685 U
Bis(2-chloroethyl)ether		1	0.76 U
2-Chlorophenol		1	0.805 U
1,3-Dichlorobenzene		5	0.265 U
1,4-Dichlorobenzene		4.7	0.22 U
1,2-Dichlorobenzene		4.7	0.41 U
2-Methylphenol		1	0.285 U
2,2'-oxybis(1-chloropropane)			1.22 U
4-Methylphenol		1	0.37 U
N-Nitroso-di-n-propylamine			0.365 U
Hexachloroethane		5	0.34 U
Nitrobenzene		5	0.585 U
Isophorone		50	0.3 U
2-Nitrophenol		1	0.82 U
2,4-Dimethylphenol		1	1.15 U
Bis(2-chloroethoxy)methane		5	0.28 U
2,4-Dichlorophenol		1	0.35 U
1,2,4-Trichlorobenzene		5	0.275 U
Naphthalene		10	0.23 U
4-Chloroaniline		5	1.02 U
Hexachlorobutadiene		5	0.625 U
4-Chloro-3-methylphenol		1	0.375 U
2-Methylnaphthalene			0.22 U
Hexachlorocyclopentadiene		5	0.945 U
2,4,6-Trichlorophenol		1	0.815 U
2,4,5-Trichlorophenol		1	0.65 U

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U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
2-Chloronaphthalene		10	0.39 U
2-Nitroaniline		5	0.98 U
Dimethylphthalate		50	0.275 U
Acenaphthylene			0.236 U
2,6-Dinitrotoluene		5	0.465 U
3-Nitroaniline		5	0.605 U
Acenaphthene		20	0.355 U
2,4-Dinitrophenol		1	2.155 U
4-Nitrophenol		1	1.4 U
Dibenzofuran			0.33 U
2,4-Dinitrotoluene		5	0.54 U
Diethylphthalate		50	0.3 U
Fluorene		50	0.36 U
4-chlorophenyl-phenylether			0.42 U
4-Nitroaniline		5	0.54 U
4,6-Dinitro-2-methylphenol			1.215 U
N-Nitrosodiphenylamine		50	0.775 U
4-Bromophenyl Phenylether			0.605 U
Hexachlorobenzene		0.35	0.64 U
Pentachlorophenol		1	0.58 U
Phenanthrene		50	0.265 U
Anthracene		50	0.435 U
Carbazole			0.35 U
Di-n-butyl Phthalate		50	0.65 U
Fluoranthene		50	0.77 U
Pyrene		50	0.74 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-18

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Butylbenzylphthalate		50	3.95 U
Benzo(a)anthracene		0.002	0.37 U
3,3-Dichlorobenzidine		5	3.51 U
Chrysene		0.002	0.93 U
Bis(2-ethylhexyl)phthalate		50	2.935 U
Di-n-octyl Phthalate		50	2.555 U
Benzo(b)fluoranthene		0.002	1.39 U
Benzo(k)fluoranthene		0.002	2.35 U
Benzo(a)pyrene		0	0.295 U
Indeno(1,2,3-cd)pyrene		0.002	0.37 U
Dibenzo(a,h)anthracene			0.37 U
Benzo(ghi)perylene			0.365 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I			0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II			0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate			0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I			0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II			0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate			0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I			0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II			0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate			0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I			0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II			0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate			0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE	NYSDEC CLASS GA GROUNDWATER STDS/GUIDANCE	MW-07S MW-07S 10/27/97	MW-10D MW-10D 10/30/97	MW-10I MW-10I 10/30/97	MW-10S MW-10S 10/30/97	MW-11D MW-11D 10/31/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I		0	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate		0	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I		0	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate		0	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
alpha-BHC		0	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
beta-BHC		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
delta-BHC		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Lindane		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Heptachlor		0	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Aldrin		0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Heptachlor Epoxide		0	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
Endosulfan I			0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U
Dieldrin		0	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U
4,4'-DDE		0	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Endrin		0	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II			0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
4,4'-DDD		0	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endosulfan Sulfate			0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT		0	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Methoxychlor		35	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Endrin Ketone		5	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Endrin Aldehyde		5	0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
alpha-Chlordane			0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
gamma-Chlordane			0.0008 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toxaphene		0	0.00521 U	0.00521 U	0.00521 U	0.00521 U	0.00521 U
Aroclor 1016		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1221		0.1	0.0082 U	0.0082 U	0.0082 U	0.0082 U	0.0082 U
Aroclor 1232		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1242		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1248		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Aroclor 1254		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Aroclor 1260		0.1	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
alpha-BHC		0	0.0002 U
beta-BHC		0	0.0003 U
delta-BHC		0	0.0004 U
Lindane		0	0.0004 U
Heptachlor		0	0.0008 U
Aldrin		0	0.001 U
Heptachlor Epoxide		0	0.0012 U
Endosulfan I			0.0016 U
Dieldrin		0	0.0051 U
4,4'-DDE		0	0.0005 U
Endrin		0	0.0006 U
Endosulfan II			0.0002 U
4,4'-DDD		0	0.0004 U
Endosulfan Sulfate			0.0013 U
4,4'-DDT		0	0.0003 U
Methoxychlor		35	0.0003 U
Endrin Ketone		5	0.0004 U
Endrin Aldehyde		5	0.0008 U
alpha-Chlordane			0.0018 U
gamma-Chlordane			0.0008 U
Toxaphene		0	0.00521 U
Aroclor 1016		0.1	0.0056 U
Aroclor 1221		0.1	0.0082 U
Aroclor 1232		0.1	0.0056 U
Aroclor 1242		0.1	0.0056 U
Aroclor 1248		0.1	0.0056 U

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U: Compound analyzed for but not detected

Table 4-19

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
PESTICIDE/PCB RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Aroclor 1254		0.1	0.0056 U
Aroclor 1260		0.1	0.0056 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Compound analyzed for but not detected

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Aluminum			105 B	60.8 B	378	33.5 B	80.2 B
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	2.4 U	2.4 U	2.5 B	2.4 U	2.4 U
Barium		1000	111 B	93.2 B	75.5 B	6.9 B	47.9 B
Beryllium		3	0.13 B	0.10 B	0.20 B	0.10 B	0.10 B
Cadmium		10	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Calcium			35300	7510	93000	4750 B	4990 B
Chromium		50	0.53 B	0.4 U	2.7 B	0.4 U	0.70 B
Cobalt			1.3 B	2.7 B	2.5 B	1.1 U	1.1 B
Copper		200	1.9 B	0.93 B	3.2 B	0.7 U	3.6 B
Iron		300	110	80.1 B	[6710]	33.2 B	249
Lead		25	1.3 B	1.0 U	12.7	1.0 U	3.5
Magnesium		35000	10700	3720 B	8940	2220 B	685 B
Manganese		300	132	286	[944]	54.8	40.9
Mercury		2	0.1 U	0.1 U	0.12 B	0.1 U	0.1 U
Nickel			2.2 B	5.1 B	1.3 U	1.3 U	1.3 U
Potassium			6780	4250 B	10000	636 B	3100 B
Selenium		10	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
Silver		50	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	[61000]	[120000]	[51400]	8120	15300
Thallium		4	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Vanadium			1.2 U	1.2 U	1.2 B	1.2 U	1.2 U
Zinc		300	39.0	29.5	37.0	27.5	37.0
Cyanide		100	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Aluminum			146 B	156 B	162 B	1080	52.9 B
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	2.4 U	2.4 U	2.4 U	3.2 B	7.6 B
Barium		1000	26.3 B	6.0 B	14.8 B	136 B	186 B
Beryllium		3	0.77 B	0.1 U	0.1 U	0.1 U	0.10 B
Cadmium		10	0.57 B	0.3 U	0.3 U	0.3 U	0.3 U
Calcium			27000	9040	10600	50800	56100
Chromium		50	1.1 B	0.4 U	0.4 U	3.1 B	0.4 U
Cobalt			1.5 B	1.1 U	1.1 U	1.1 B	14.9 B
Copper		200	4.0 B	0.7 U	2.4 B	3.3 B	0.7 U
Iron		300	[312]	191	[462]	[12700]	[66000]
Lead		25	2.1 B	1.0 U	1.4 B	1.4 B	1.0 U
Magnesium		35000	2890 B	4000 B	5720	7970	8830
Manganese		300	5.6 B	52.8	113	[7270]	[1700]
Mercury		2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			1.3 U	1.3 U	1.3 U	2.6 B	7.4 B
Potassium			4660 B	753 B	1200 B	7870	14000
Selenium		10	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
Silver		50	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	18900	17600	10300	[40400]	[21100]
Thallium		4	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Vanadium			1.2 U	1.2 U	1.2 U	3.7 B	1.2 U
Zinc		300	20.8	18.9 B	65.5	34.0	85.9
Cyanide		100	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Aluminum			365	574	241	330	121 B
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	10.1	11.4	2.4 U	4.3 B	2.4 U
Barium		1000	128 B	441	117 B	17.8 B	296
Beryllium		3	0.10 B	0.20 B	0.17 B	0.10 B	0.13 B
Cadmium		10	0.3 U	0.3 U	0.30 B	0.3 U	0.3 U
Calcium			53200	152000	47300	8280	105000
Chromium		50	3.7 B	1.6 B	2.9 B	3.3 B	6.5 B
Cobalt			2.5 B	2.1 B	4.6 B	1.1 U	1.3 B
Copper		200	5.2 B	2.5 B	4.8 B	2.5 B	0.7 U
Iron		300	[31800]	[56800]	[374]	[7250]	[32000]
Lead		25	3.7	1.0 U	1.2 B	3.0	1.0 U
Magnesium		35000	9580	22600	12400	1260 B	17900
Manganese		300	[480]	[1520]	[17200]	[1080]	[3370]
Mercury		2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			3.9 B	1.3 U	5.1 B	3.6 B	4.6 B
Potassium			69400	30800	20200	4820 B	20600
Selenium		10	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
Silver		50	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	[29200]	[29900]	[26500]	12500	[35000]
Thallium		4	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Vanadium			4.4 B	3.2 B	1.2 U	1.2 U	1.8 B
Zinc		300	96.1	32.3	283	95.3	25.0
Cyanide		100	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
Aluminum			320	140 B	96.2 B	1420	90.1 B
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	3.2 B	4.3 B	9.6 B	2.4 U	2.4 U
Barium		1000	15.1 B	107 B	306	11.4 B	32.2 B
Beryllium		3	0.1 U	0.10 B	0.10 B	0.13 B	0.1 U
Cadmium		10	0.3 U	0.3 U	0.3 U	0.3 U	0.47 B
Calcium			5070	33300	131000	1210 B	8890
Chromium		50	1.3 B	0.73 B	1.3 B	3.4 B	0.80 B
Cobalt			6.6 B	6.4 B	2.2 B	1.5 B	2.3 B
Copper		200	2.5 B	3.9 B	0.7 U	7.6 B	1.6 B
Iron		300	[5220]	[6490]	[58700]	[1560]	[396]
Lead		25	1.0 U	1.0 B	1.0 U	3.0	2.8 B
Magnesium		35000	2040 B	3810 B	16400	609 B	1300 B
Manganese		300	[6800]	[2100]	[837]	55.7	[519]
Mercury		2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			3.3 B	2.0 B	1.3 U	12.9 B	1.8 B
Potassium			1140 B	7680	18200	569 B	3840 B
Selenium		10	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
Silver		50	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	11600	14000	18900	16800	6950
Thallium		4	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Vanadium			1.2 U	1.2 U	1.2 U	2.6 B	1.2 U
Zinc		300	75.1	61.4	14.2 B	207	51.7
Cyanide		100	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
Aluminum			276	134 B	54.9 B	553	473
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Barium		1000	18.7 B	206	38.6 B	18.7 B	27.8 B
Beryllium		3	0.10 B	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium		10	0.3 U	0.83 B	0.30 B	0.3 U	0.3 U
Calcium			34100	31000	5220	33000	7300
Chromium		50	4.1 B	4.3 B	0.4 U	0.4 U	0.43 B
Cobalt			1.1 B	10.0 B	1.7 B	1.1 U	1.1 U
Copper		200	1.8 B	0.7 U	0.7 U	2.5 B	0.7 U
Iron		300	[610]	[10300]	95.4 B	[670]	153
Lead		25	1.0 U	3.2	1.0 U	1.0 U	1.0 U
Magnesium		35000	1890 B	11700	1540 B	3940 B	1330 B
Manganese		300	27.0	[36100]	[2940]	[1600]	74.6
Mercury		2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			2.4 B	15.1 B	1.8 B	1.3 U	2.1 B
Potassium			5730	5370	2780 B	8010	10000
Selenium		10	2.8 U	3.4 B	2.8 U	2.8 U	2.8 U
Silver		50	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	8170	[628000]	[137000]	[98100]	8050
Thallium		4	2.6 U	[5.1] B	2.9 B	2.8 B	2.7 B
Vanadium			1.2 U	1.2 U	1.2 U	1.2 U	1.4 B
Zinc		300	16.6 B	124	22.5	17.3 B	19.0 B
Cyanide		100	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Aluminum			113 B	703	288	281	275
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
Barium		1000	22.2 B	30.5 B	6.6 B	25.1 B	24.7 B
Beryllium		3	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium		10	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Calcium			10200	39100	8460	13000	32500
Chromium		50	0.4 U	0.73 B	0.87 B	0.4 U	8.3 B
Cobalt			4.7 B	2.1 B	1.1 U	1.1 U	1.1 U
Copper		200	3.1 B	3.2 B	2.4 B	1.0 B	0.7 U
Iron		300	191 U	[739]	[312]	213	[326]
Lead		25	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Magnesium		35000	6510	4000 B	2330 B	4930 B	1730 B
Manganese		300	245	[1820]	82.5	[1290]	29.2
Mercury		2	0.3 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			4.3 U	2.6 B	1.3 U	1.5 B	1.3 U
Potassium			3870 B	8620	837 B	1520 B	14700
Selenium		10	8.4 U	2.8 U	2.8 U	2.8 U	2.8 U
Silver		50	2.8 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	11100	[43700]	8400	10800	17800
Thallium		4	2.3 U	3.2 B	2.6 U	2.6 U	2.6 U
Vanadium			2.6 U	1.8 B	1.2 B	1.2 U	1.2 U
Zinc		300	100	12.7 B	[311]	39.2	15.0 B
Cyanide		100	1.4 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Aluminum			190 B	1160	544	37.0 B	83.1 B
Antimony		3	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Arsenic		25	2.4 U	2.4 U	2.4 U	2.4 U	11.7
Barium		1000	104 B	262	32.9 B	172 B	118 B
Beryllium		3	0.1 U	0.80 B	0.10 B	0.1 U	0.1 U
Cadmium		10	0.3 U	0.33 B	0.3 U	0.3 U	0.3 U
Calcium			58600	32900	7570	52600	68600
Chromium		50	4.7 B	0.60 B	1.3 B	0.4 U	0.4 U
Cobalt			9.8 B	30.1 B	1.1 U	9.5 B	6.2 B
Copper		200	0.97 B	3.2 B	3.6 B	0.7 U	0.93 B
Iron		300	[524]	[27700]	[683]	[24500]	[54200]
Lead		25	1.7 B	1.0 U	1.0 U	1.0 U	1.0 U
Magnesium		35000	8920	3580 B	1890 B	11900	10400
Manganese		300	[31000]	[1610]	157	[6290]	[461]
Mercury		2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel			6.6 B	2.7 B	3.0 B	3.6 B	1.3 U
Potassium			13900	7910	1930 B	31100	16200
Selenium		10	3.8 B	2.8 U	2.8 U	2.8 U	2.8 U
Silver		50	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Sodium		20000	16100	[26900]	8230	19100	14200
Thallium		4	2.6 U	[4.3] B	3.5 B	2.6 B	3.4 B
Vanadium			1.2 U	1.5 B	1.2 B	1.2 U	1.2 U
Zinc		300	65.1	45.9	13.9 B	42.4	50.7
Cyanide		100	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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[] = Greater than Action Level
U: Compound analyzed for but not detected
B: Concentration is above IDL but below CRDL

Table 4-20

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
METAL RESULTS

Date: 01/23/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Aluminum			507
Antimony		3	3.0 U
Arsenic		25	2.4 U
Barium		1000	24.6 B
Beryllium		3	0.10 B
Cadmium		10	0.43 B
Calcium			8850
Chromium		50	0.4 U
Cobalt			1.1 U
Copper		200	3.0 B
Iron		300	[575]
Lead		25	1.0 U
Magnesium		35000	1960 B
Manganese		300	71.3
Mercury		2	0.1 U
Nickel			1.4 B
Potassium			3230 B
Selenium		10	2.8 U
Silver		50	0.9 U
Sodium		20000	9970
Thallium		4	2.6 U
Vanadium			1.2 B
Zinc		300	116
Cyanide		100	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	10/24/97	10/24/97	10/24/97	10/27/97	10/27/97
Ammonia (as N)		2	0.36	0.9	1.0	0.24	0.65
Total Organic Carbon			1.3	2.8	11.7	0.7	1.5
Residue, filterable			452	356	432	76	103
Alkalinity (as CaCO3)			11.4	20.7	264	10.2	12.3
Chloride		250	198	195	69.7	9.4	10.0
Nitrogen, Kjeldahl, total (as N)			0.2 U	0.2 U	2.3	0.23	0.80
Nitrate		10	1.2	0.72	0.1 U	1.4	1.9
BOD			20	2 U	2 U	2 U	2 U
COD			3 U	3 U	46	15 U	15 U
Sulfate		250	5.2	35.2	36.3	12.6	32.9
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			5 U	5 U	80	5 U	5 U
Hardness (as CaCO3)			146	42	310	30	26
Boron		1.0	0.040 B	0.15	0.16	0.029 B	0.081 B
Bromide		2	0.5 U	0.5 U	0.7	0.5 U	0.5 U
Total Phenols		0.001	[0.0011]	0.0010 U	0.0010 U	0.0010 U	0.0010 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/28/97
Ammonia (as N)		2	0.08	0.08	0.24	[2]	[2.8]
Total Organic Carbon			2.2	1.3	2.1	7.7	4.7
Residue, filterable			171	107	86	246	318
Alkalinity (as CaCO3)			86.6	30.7	36.2	187	210
Chloride		250	21.2	22	15	75.3	50.1
Nitrogen, Kjeldahl, total (as N)			0.20	0.2 U	0.45	3.1	5.6
Nitrate		10	0.82	3.6	0.88	0.1 U	0.1 U
BOD			2 U	2 U	4	11	8
COD			15 U	15 U	15 U	37	46
Sulfate		250	20.9	22.8	20.4	5 U	18.3
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			5 U	5 U	5 U	70	150
Hardness (as CaCO3)			92	46	52	190	280
Boron		1.0	0.043 B	0.12	0.084 B	0.13	0.36
Bromide		2	0.5 U	0.5 U	0.5 U	0.5 U	1.1
Total Phenols		0.001	0.0010 U	0.0010 U	[0.0020]	[0.0018]	[0.0049]

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	10/29/97	10/29/97	10/29/97	10/29/97	10/29/97
Ammonia (as N)		2	1.8	[9.3]	[4.3]	0.49	[4.4]
Total Organic Carbon			5.2	17.3	6.0	1.8	9.6
Residue, filterable			424	624	337	100	482
Alkalinity (as CaCO3)			309	618	234	30.4	412
Chloride		250	28.7	63.3	51.5	24.3	82.1
Nitrogen, Kjeldahl, total (as N)			4.3	23.3	6.0	0.70	9.6
Nitrate		10	0.12	0.1 U	0.1 U	0.1 U	0.1 U
BOD			6	5	2	3	8
COD			37	67	43	16	46
Sulfate		250	14.5	5 U	27.5	8.9	5 U
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			30	150	5 U	40	60
Hardness (as CaCO3)			210	540	260	50	400
Boron		1.0	0.24	0.48	0.15	0.091 B	0.32
Bromide		2	0.8	1.0	0.5 U	0.6	0.5 U
Total Phenols		0.001	[0.0039]	[0.0049]	[0.0015]	0.0010 U	[0.0049]

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	10/28/97	10/28/97	10/28/97	10/27/97	10/28/97
Ammonia (as N)		2	0.32	0.76	[7.2]	0.37	1.3
Total Organic Carbon			2.0	2.4	11.4	0.8	1.9
Residue, filterable			78	190	480	101	65
Alkalinity (as CaCO3)			31.3	115	453	22.7	23.4
Chloride		250	7.3	25.4	39.8	11.6	9.2
Nitrogen, Kjeldahl, total (as N)			0.2 U	1.4	17.3	0.36	1.7
Nitrate		10	0.1 U	0.1 U	0.1 U	1.3	0.88
BOD			3	2 U	5	2 U	6
COD			15 U	15 U	46	25	15 U
Sulfate		250	20.3	21.2	5 U	5.2	19.9
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			10	10	150	20	5 U
Hardness (as CaCO3)			120	180	440	9	180
Boron		1.0	0.033 B	0.12	0.40	0.039 B	0.046 B
Bromide		2	0.5 U	0.5 U	0.6	0.9	0.5 U
Total Phenols		0.001	0.0010 U	[0.0018]	[0.0054]	0.0010 U	0.0010 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

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U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	10/27/97	10/30/97	10/30/97	10/30/97	10/31/97
Ammonia (as N)		2	0.26	0.55	1.3	0.5	0.5
Total Organic Carbon			1.0	1.9	6.3	6.4	5.6
Residue, filterable			181	1950	400	361	124
Alkalinity (as CaCO3)			88.0	13.9	36.4	93	36.8
Chloride		250	10.6	[1230]	183	126	13.3
Nitrogen, Kjeldahl, total (as N)			0.2 U	0.81	1.9	0.53	0.58
Nitrate		10	2.4	0.14	0.7	0.1 U	1.5
BOD			2 U	3	2	2	4
COD			15 U	82	16	25	40
Sulfate		250	11.6	101	45.4	69.6	31.3
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			5 U	30	5 U	10	80
Hardness (as CaCO3)			98	220	24	104	26
Boron		1.0	0.036 B	0.063 B	0.12	0.11	0.019 B
Bromide		2	0.5 U	0.5 U	0.6	0.5 U	0.5 U
Total Phenols		0.001	0.0010 U	0.0010 U	[0.0013]	[0.0015]	[0.0063]

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

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B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	10/31/97	10/31/97	10/31/97	10/31/97	10/31/97
Ammonia (as N)		2	0.99	1	0.02 U	0.51	0.11
Total Organic Carbon			1.6	3.7	0.5 U	3.6	2.3
Residue, filterable			96	261	45	106	170
Alkalinity (as CaCO3)			27.6	127	19.3	10.5	102
Chloride		250	40.4	65.1	11.7	17.5	21
Nitrogen, Kjeldahl, total (as N)			1.5	1.2	0.2 U	0.46	0.21
Nitrate		10	0.13	0.28	0.32	4.7	0.75
BOD			2 U	2 U	3	2 U	3
COD			15 U	22	15 U	16	16
Sulfate		250	14.9	42.1	19.5	43.1	32.8
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			5 U	100	5 U	5 U	5 U
Hardness (as CaCO3)			54	120	34	54	90
Boron		1.0	0.10	0.45	0.028 B	0.10	0.080 B
Bromide		2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Phenols		0.001	[0.0013]	[0.0018]	[0.0018]	0.0010 U	0.0010 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	11/03/97	11/03/97	11/03/97	11/03/97	11/03/97
Ammonia (as N)		2	[5]	[2]	0.12	[7.7]	[7.2]
Total Organic Carbon			3.9	3.4	0.5 U	6.3	5.8
Residue, filterable			306	207	67	280	240
Alkalinity (as CaCO3)			242	116	2	274	225
Chloride		250	34.8	33.2	13.7	45.4	24.8
Nitrogen, Kjeldahl, total (as N)			5.5	2.9	0.2 U	10.8	6.4
Nitrate		10	0.29	0.1 U	0.1 U	0.89	0.1 U
BOD			2 U	2 U	2 U	2 U	18
COD			37	19	15 U	31	28
Sulfate		250	21.4	33.4	19.3	7.4	5 U
Chromium (Hexavalent)		0	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Color (APHA Units)			5 U	20	30	20	20
Hardness (as CaCO3)			400	110	26	200	200
Boron		1.0	0.14	0.094 B	0.036 B	0.29	0.22
Bromide		2	0.5 U	0.6	0.5 U	0.5 U	0.5 U
Total Phenols		0.001	[0.0025]	0.0010 U	0.0010 U	0.0010 U	0.0010 U

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U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-21

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING
LEACHATE PARAMETER RESULTS

Date: 01/23/98

CONSTITUENT (Units in mg/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	11/03/97
Ammonia (as N)		2	0.02 U
Total Organic Carbon			0.5 U
Residue, filterable			93
Alkalinity (as CaCO3)			10.8
Chloride		250	15.7
Nitrogen, Kjeldahl, total (as N)			0.2 U
Nitrate		10	4.5
BOD			2 U
COD			15 U
Sulfate		250	12.2
Chromium (Hexavalent)		0	0.02 U
Color (APHA Units)			5 U
Hardness (as CaCO3)			36
Boron		1.0	0.026 B
Bromide		2	0.5 U
Total Phenols		0.001	0.0010 U

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U: Compound analyzed for but not detected

B: Concentration is above IDL but below CRDL

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	01/28/98	01/28/98	01/28/98	01/28/98	01/28/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Methylene Chloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Acetone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	[15.0]	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethane		5	[22.0]	[13.0]	[12.0]	10.0 U	10.0 U
1,2-Dichloroethene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Butanone			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	[170.0]	[5.1] J	10.0 U	10.0 U	10.0 U
Carbon Tetrachloride		5	[20.0]	10.0 U	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Benzene		0.7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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[] = Greater than Action Level
U:Compound analyzed for but not detected J:Value below CRDL B:Compound found in the blank as well as the sample

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	SAMPLE ID	GROUNDWATER	MW-01D	MW-01I	MW-01S	MW-02D	MW-02I
	DATE	STDS/GUIDANCE	01/28/98	01/28/98	01/28/98	01/28/98	01/28/98
Tetrachloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Toluene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	01/28/98	02/02/98	02/02/98	02/02/98	01/28/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	[27.0]
Methylene Chloride		5	10.0 U	2.5 J	10.0 U	10.0 U	10.0 U
Acetone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	10.0 U	2.9 J	3.6 J	10.0 U	10.0 U
1,1-Dichloroethane		5	10.0 U	3.5 J	[36.0]	10.0 U	10.0 U
1,2-Dichloroethene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	3.0 J
2-Butanone			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	10.0 U	[18.0]	[9.8] J	10.0 U	10.0 U
Carbon Tetrachloride		5	10.0 U	3.0 J	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	10.0 U	10.0 U	3.0 J	10.0 U	10.0 U
Benzene		0.7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	SAMPLE ID	GROUNDWATER	MW-02S	MW-03D	MW-03I	MW-03S	MW-04D
	DATE	STDS/GUIDANCE	01/28/98	02/02/98	02/02/98	02/02/98	01/28/98
Tetrachloroethene		5	10.0 U	2.0 J	10.0 U	10.0 U	2.5 J
1,1,2,2-Tetrachloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Toluene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U:Compound analyzed for but not detected J:Value below CRDL B:Compound found in the blank as well as the sample

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	01/28/98	02/02/98	02/03/98	02/02/98	02/03/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroethane		5	[8.6] J	[7.2] J	10.0 U	10.0 U	[5.1] J
Methylene Chloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Acetone		50	10.0 U	3.4 JB	10.0 U	3.5 JB	10.0 U
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethene (total)		5	10.0 U	10.0 U	10.0 U	4.2 J	10.0 U
2-Butanone			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Tetrachloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	10.0 U	10.0 U	10.0 U	2.2 J	10.0 U
Benzene		0.7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

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Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	SAMPLE ID	GROUNDWATER	MW-04I	MW-04S	MW-05D	MW-05I	MW-05S
	DATE	STDS/GUIDANCE	01/28/98	02/02/98	02/03/98	02/02/98	02/03/98
Tetrachloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Toluene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	10.0 U	3.0 J	3.9 J	10.0 U	2.4 J
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	01/28/98	01/28/98	01/28/98	01/28/98	01/28/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	[19.0]	10.0 U	10.0 U	[7.7] J	10.0 U
Chloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Methylene Chloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Acetone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethene (total)		5	[360.0] E	10.0 U	10.0 U	[140.0]	10.0 U
2-Butanone			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	[17.0]	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Tetrachloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	[36.0]	10.0 U	10.0 U	[50.0]	10.0 U
Benzene		0.7	10.0 U	10.0 U	[4.1] J	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	SAMPLE ID	GROUNDWATER	MW-06D	MW-06I	MW-06S	MW-07D	MW-07I
	DATE	STDS/GUIDANCE	01/28/98	01/28/98	01/28/98	01/28/98	01/28/98
Tetrachloroethene		5	[1600.0] E	10.0 U	10.0 U	[270.0] E	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Toluene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	10.0 U	10.0 U	[6.2] J	10.0 U	10.0 U
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	01/28/98	02/02/98	02/02/98	02/02/98	01/28/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Methylene Chloride		5	10.0 U	10.0 U	4.8 J	2.1 J	10.0 U
Acetone		50	10.0 U	9.6 JB	10.0 U	4.4 JB	10.0 U
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethane		5	10.0 U	3.4 J	2.8 J	4.0 J	10.0 U
1,2-Dichloroethene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Butanone			10.0 U	7.8 J	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Tetrachloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	10.0 U	2.1 J	10.0 U	10.0 U	10.0 U
Benzene		0.7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	[6.5] J	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	7.0 J	10.0 U	10.0 U	10.0 U

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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	SAMPLE ID	GROUNDWATER	MW-07S	MW-10D	MW-10I	MW-10S	MW-11D
	DATE	STDS/GUIDANCE	01/28/98	02/02/98	02/02/98	02/02/98	01/28/98
Tetrachloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U	3.4 J	10.0 U	10.0 U	10.0 U
Toluene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	01/28/98	01/28/98	01/28/98	01/30/98	01/30/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Methylene Chloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Acetone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethane		5	3.2 J	[7.2] J	10.0 U	10.0 U	10.0 U
1,2-Dichloroethene (total)		5	10.0 U	[16.0]	10.0 U	10.0 U	10.0 U
2-Butanone			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Tetrachloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	10.0 U	[6.5] J	10.0 U	10.0 U	10.0 U
Benzene		0.7	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

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SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	SAMPLE ID	GROUNDWATER	MW-11I	MW-11S	MW-12D	MW-12I	MW-12S
	DATE	STDS/GUIDANCE	01/28/98	01/28/98	01/28/98	01/30/98	01/30/98
Tetrachloroethene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Toluene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U:Compound analyzed for but not detected J:Value below CRDL B:Compound found in the blank as well as the sample

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	02/03/98	02/03/98	02/03/98	02/03/98	02/03/98
Chloromethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromomethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl Chloride		2	10.0 U	[4.7] J	10.0 U	10.0 U	10.0 U
Chloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	[6.9] J
Methylene Chloride		5	10.0 U	2.3 J	2.4 J	2.9 J	10.0 U
Acetone		50	10.0 U	10.0 U	10.0 U	10.0 U	5.5 J
Carbon Disulfide		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethene		5	2.0 J	10.0 U	10.0 U	10.0 U	10.0 U
1,1-Dichloroethane		5	3.6 J	3.1 J	10.0 U	10.0 U	10.0 U
1,2-Dichloroethene (total)		5	[34.0]	[53.0]	10.0 U	10.0 U	10.0 U
2-Butanone			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Chloroform		7	10.0 U	10.0 U	10.0 U	2.1 J	10.0 U
1,2-Dichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,1-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Carbon Tetrachloride		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromodichloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,2-Dichloropropane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
cis-1,3-Dichloropropene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Trichloroethene		5	2.9 J	4.8 J	10.0 U	10.0 U	10.0 U
Benzene		0.7	[2.7] J	10.0 U	10.0 U	10.0 U	10.0 U
Dibromochloromethane		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
trans-1,3-Dichloropropene			10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
1,1,2-Trichloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Bromoform		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
4-Methyl-2-pentanone		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
2-Hexanone		50	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U: Compound analyzed for but not detected J: Value below CRDL B: Compound found in the blank as well as the sample

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	SAMPLE ID	GROUNDWATER	MW-13D	MW-13I	MW-13S	MW-14D	MW-14I
	DATE	STDS/GUIDANCE	02/03/98	02/03/98	02/03/98	02/03/98	02/03/98
Tetrachloroethene		5	10.0 U	[11.0]	10.0 U	10.0 U	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Toluene		5	2.5 J	10.0 U	10.0 U	10.0 U	10.0 U
Chlorobenzene		5	4.1 J	10.0 U	10.0 U	10.0 U	10.0 U
Ethylbenzene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Styrene		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Xylene (total)		5	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

[] = Greater than Action Level

U:Compound analyzed for but not detected J:Value below CRDL B:Compound found in the blank as well as the sample

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	02/03/98
Chloromethane		5	10.0 U
Bromomethane		5	10.0 U
Vinyl Chloride		2	10.0 U
Chloroethane		5	10.0 U
Methylene Chloride		5	2.0 J
Acetone		50	10.0 U
Carbon Disulfide		50	10.0 U
1,1-Dichloroethene		5	10.0 U
1,1-Dichloroethane		5	10.0 U
1,2-Dichloroethene (total)		5	10.0 U
2-Butanone			10.0 U
Chloroform		7	2.1 J
1,2-Dichloroethane		5	10.0 U
1,1,1-Trichloroethane		5	10.0 U
Carbon Tetrachloride		5	10.0 U
Bromodichloromethane		50	10.0 U
1,2-Dichloropropane		5	10.0 U
cis-1,3-Dichloropropene		5	10.0 U
Trichloroethene		5	10.0 U
Benzene		0.7	10.0 U
Dibromochloromethane		50	10.0 U
trans-1,3-Dichloropropene			10.0 U
1,1,2-Trichloroethane		5	10.0 U
Bromoform		50	10.0 U
4-Methyl-2-pentanone		5	10.0 U
2-Hexanone		50	10.0 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit NA=Not analyzed

U:Compound analyzed for but not detected J:Value below CRDL B:Compound found in the blank as well as the sample

Table 4-22

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MONITORING WELL SAMPLING - 2ND ROUND
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/l)	SITE	NYSDEC CLASS GA	MW-14S
	SAMPLE ID	GROUNDWATER	MW-14S
	DATE	STDS/GUIDANCE	02/03/98
Tetrachloroethene		5	10.0 U
1,1,2,2-Tetrachloroethane		5	10.0 U
Toluene		5	10.0 U
Chlorobenzene		5	10.0 U
Ethylbenzene		5	10.0 U
Styrene		5	10.0 U
Xylene (total)		5	10.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U:Compound analyzed for but not detected J:Value below CRDL B:Compound found in the blank as well as the sample

MW-12			
COMPOUND	S	I	D
NO EXCEEDANCES			

MW-11			
COMPOUND	S	I	D
1,2 DCE	24/16	-/-	-/-
TCE	12/6.5	-/-	-/-
1,1 DCA	-/7.2	7/-	-/-

MW-01			
COMPOUND	S	I	D
1,1 DCE	-/-	-/-	-/15
1,1 DCA	8/12	14/13	13/22
1,1,1 TCA	-/-	22/5.1	66/170
CT	-/-	-/-	-/20

MW-10			
COMPOUND	S	I	D
1,1 DCA	24/-	11/-	8/-
4M, 2P	-/-	-/-	-/6.5

MW-03			
COMPOUND	S	I	D
1,1 DCE	-/-	-/-	9/-
1,1 DCA	-/-	46/36	10/-
1,1,1 TCA	-/-	16/9.8	61/18

MW-05			
COMPOUND	S	I	D
CA	9/5.1	-/-	-/-

MW-14			
COMPOUND	S	I	D
VC	-/-	-/-	14/-
1,2 DCE	-/-	-/-	21/-
CA	-/-	8/6.9	-/-

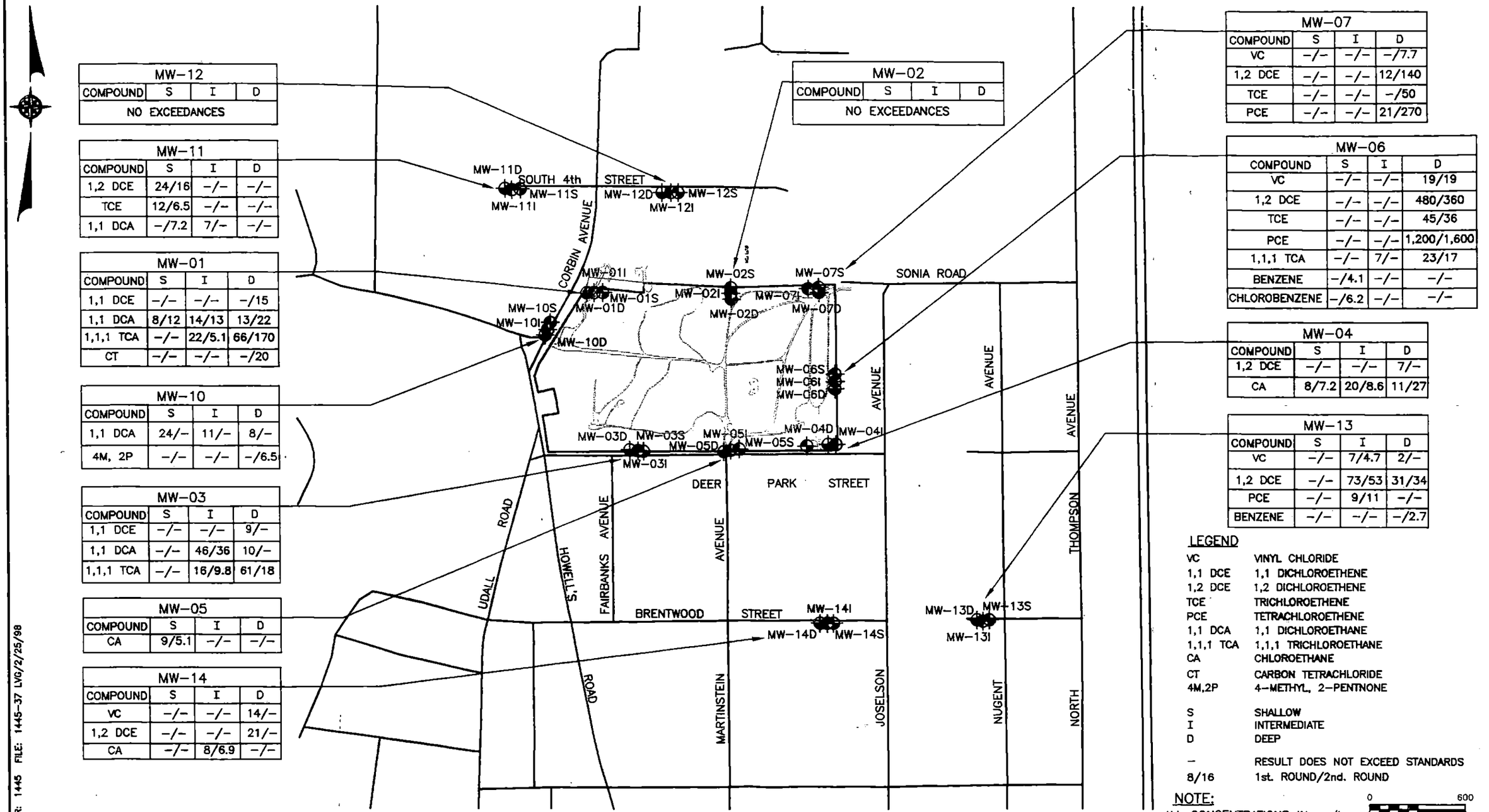
MW-02			
COMPOUND	S	I	D
NO EXCEEDANCES			

MW-07			
COMPOUND	S	I	D
VC	-/-	-/-	-/7.7
1,2 DCE	-/-	-/-	12/140
TCE	-/-	-/-	-/50
PCE	-/-	-/-	21/270

MW-06			
COMPOUND	S	I	D
VC	-/-	-/-	19/19
1,2 DCE	-/-	-/-	480/360
TCE	-/-	-/-	45/36
PCE	-/-	-/-	1,200/1,600
1,1,1 TCA	-/-	7/-	23/17
BENZENE	-/4.1	-/-	-/-
CHLOROBENZENE	-/6.2	-/-	-/-

MW-04			
COMPOUND	S	I	D
1,2 DCE	-/-	-/-	7/-
CA	8/7.2	20/8.6	11/27

MW-13			
COMPOUND	S	I	D
VC	-/-	7/4.7	2/-
1,2 DCE	-/-	73/53	31/34
PCE	-/-	9/11	-/-
BENZENE	-/-	-/-	-/2.7



LEGEND

VC	VINYL CHLORIDE
1,1 DCE	1,1 DICHLOROETHENE
1,2 DCE	1,2 DICHLOROETHENE
TCE	TRICHLOROETHENE
PCE	TETRACHLOROETHENE
1,1 DCA	1,1 DICHLOROETHANE
1,1,1 TCA	1,1,1 TRICHLOROETHANE
CA	CHLOROETHANE
CT	CARBON TETRACHLORIDE
4M,2P	4-METHYL, 2-PENTNONE
S	SHALLOW
I	INTERMEDIATE
D	DEEP
-	RESULT DOES NOT EXCEED STANDARDS
8/16	1st. ROUND/2nd. ROUND

NOTE:
ALL CONCENTRATIONS IN ug/l

0 600
SCALE IN FEET

DIR: 1445 FILE: 1445-37 LVG/2/25/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

CONCENTRATIONS OF VOLATILE ORGANIC COMPOUNDS EXCEEDING GROUNDWATER STANDARDS IN MONITORING WELLS

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 4-2

MW-11			
PARAMETER	S	I	D
COND	0.465	0.188	0.112
ALK	127	27.6	37
NH_4	1.0	0.99	0.5
Fe	739	191	153
Mn	1,820	245	75

MW-01			
PARAMETER	S	I	D
COND	0.565	0.627	0.610
ALK	264	20.7	11.4
NH_4	1.0	0.9	0.36
Fe	6,710	80	110
Mn	944	286	132

MW-10			
PARAMETER	S	I	D
COND	0.623	0.712	4.68
ALK	93	36.4	13.9
NH_4	0.5	1.3	0.55
Fe	670	95	10,300
Mn	1,600	2,940	36,100

MW-03			
PARAMETER	S	I	D
COND	0.524	0.151	0.168
ALK	187	36.2	30.7
NH_4	2.0	0.24	0.08
Fe	12,700	462	191
Mn	7,270	113	53

MW-05			
PARAMETER	S	I	D
COND	0.109	0.159	0.676
ALK	412	30.4	234
NH_4	4.4	0.49	4.3
Fe	32,000	7,250	374
Mn	3,370	1,080	17,200

MW-14			
PARAMETER	S	I	D
COND	0.135	0.599	0.633
ALK	10.8	225	274
NH_4	0.024	7.2	7.7
Fe	575	54,200	24,500
Mn	71	461	6,290

MW-12			
PARAMETER	S	I	D
COND	0.297	0.188	0.109
ALK	102	10.5	19.3
NH_4	0.11	0.51	0.02u
Fe	326	213	312
Mn	29	1,290	83

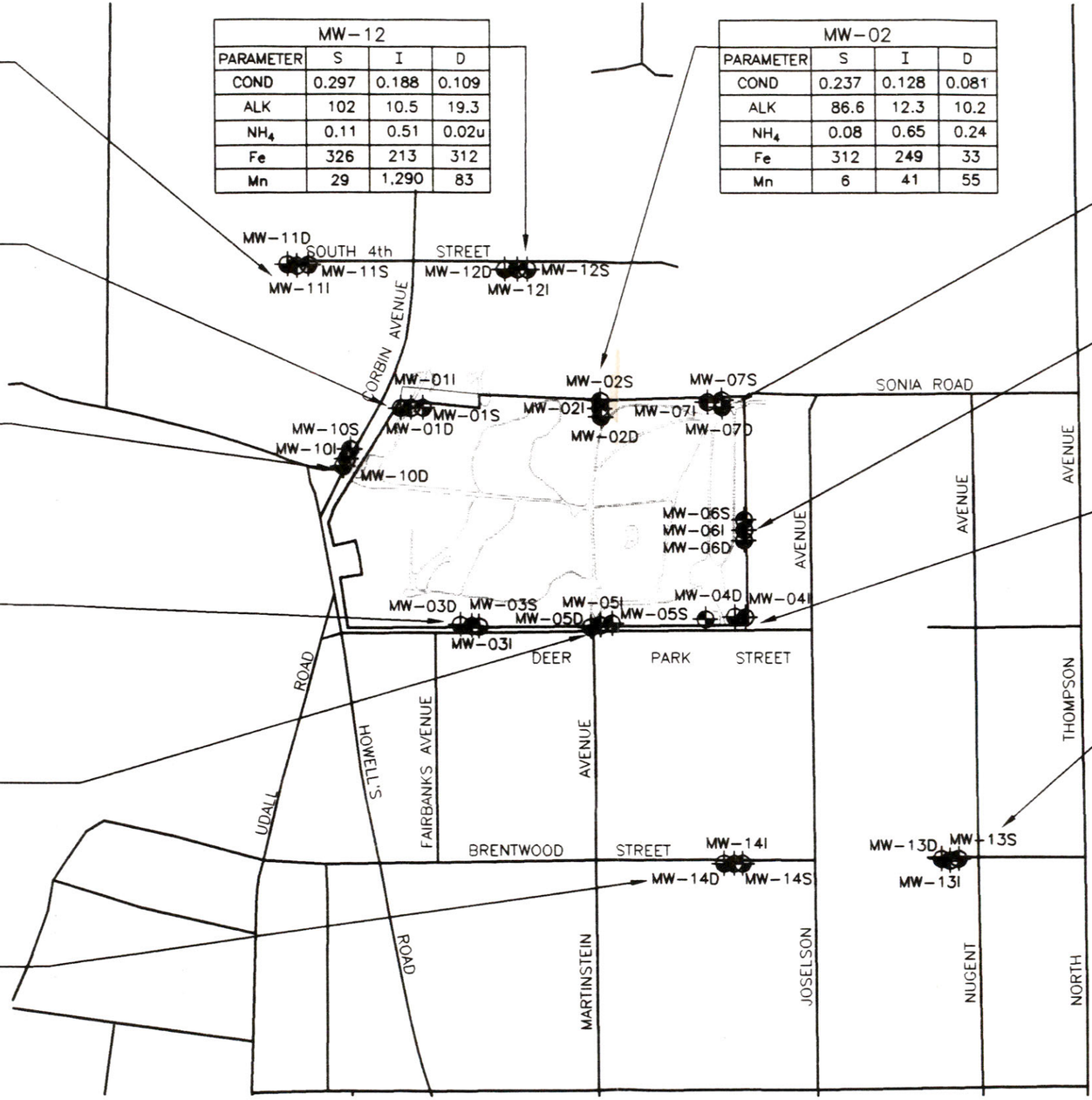
MW-02			
PARAMETER	S	I	D
COND	0.237	0.128	0.081
ALK	86.6	12.3	10.2
NH_4	0.08	0.65	0.24
Fe	312	249	33
Mn	6	41	55

MW-07			
PARAMETER	S	I	D
COND	0.232	0.112	0.083
ALK	88	23.4	22.7
NH_4	0.26	1.3	0.37
Fe	610	396	1,560
Mn	27	519	56

MW-06			
PARAMETER	S	I	D
COND	1.09	0.290	0.129
ALK	453	115	31.3
NH_4	7.2	0.76	0.32
Fe	58,700	6,490	5,220
Mn	837	2,100	6,800

MW-04			
PARAMETER	S	I	D
COND	1.42	1.12	0.661
ALK	618	309	210
NH_4	9.3	1.9	2.8
Fe	56,800	31,800	66,000
Mn	1,520	480	1,700

MW-13			
PARAMETER	S	I	D
COND	0.104	0.410	0.526
ALK	2	116	242
NH_4	0.12	2.0	5.0
Fe	683	27,700	524
Mn	157	1,610	31,000



LEGEND

COND	CONDUCTIVITY
ALK	ALKALINITY
NH_4	AMMONIA AS N
Fe	IRON
Mn	MANGANESE
S	SHALLOW
I	INTERMEDIATE
D	DEEP

NOTE:
ALL CONCENTRATIONS IN mg/l
EXCEPT CONDUCTIVITY (eV)

0 600
SCALE IN FEET

DIR: 1445 FILE: 1445-35 1/15/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

CONCENTRATIONS OF SELECT LEACHATE PARAMETERS DETECTED IN MONITORING WELLS

FIGURE 4-3

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Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

The results of the metals analysis indicated the presence of elevated levels of iron in all of the shallow wells. Several of the wells also indicated the presence of elevated levels of manganese and sodium. For the four wells (MW-03S, MW-04S, MW-05S and MW-06S) located immediately adjacent to and downgradient of the landfill, levels of iron ranged from 12,700 ug/l to 58,700 ug/l, manganese levels ranged from 837 ug/l to 7,270 ug/l, and sodium ranged from 18,200 ug/l to 40,400 ug/l.

Monitoring wells located immediately upgradient of the landfill (MW-01S, MW-02S, MW-07S, MW-10S), as well as further upgradient (MW-11S and MW-12S), indicated significantly lower levels of iron and manganese, with levels ranging from 312 ug/l to 6,710 ug/l and 5.6 ug/l to 1,820 ug/l, respectively. Sodium levels were comparable to or even higher upgradient than downgradient, with levels ranging from 8,170 ug/l to 98,100 ug/l. The elevated levels of iron and manganese detected downgradient of the landfill are likely the result of leachate contamination emanating from the landfill. The presence of leachate is further substantiated by the higher levels of conductivity and leachate parameters in the downgradient wells as compared to the upgradient wells (see Figure 4-3).

The leachate parameter analyses indicated the presence of elevated levels of ammonia (as N) and alkalinity in each of the wells located immediately downgradient of the landfill. Levels of alkalinity in the upgradient wells ranged from 86.6 mg/l to 264 mg/l and levels in the four downgradient wells ranged from 187 mg/l to 618 mg/l. None of the upgradient monitoring wells indicated the presence of elevated levels of ammonia (as N) (1.0 mg/l or less); however, the downgradient wells ranged from 2.0 to 9.3 mg/l.

Based upon the elevated levels of iron, manganese, conductivity, ammonia (as N) and alkalinity as shown in Figure 4-3, the shallow wells located immediately adjacent to and downgradient of the landfill show the presence of these leachate indicators.

Downgradient wells, MW-13S and MW-14S, indicated levels of iron and manganese consistent with the wells upgradient of the landfill. No exceedances of groundwater standards/guidelines were detected with regard to leachate parameters and levels of alkalinity were lower than the wells upgradient of the landfill. Therefore, the shallow downgradient wells do not appear to be impacted by leachate contamination.

Intermediate Groundwater Quality

The results of the groundwater analysis for the intermediate groundwater monitoring wells are presented in Appendix P. Levels of VOCs exceeding groundwater standards are presented in Figure 4-2. Elevated levels of 1,1,1-trichloroethane and 1,1-dichloroethane were detected upgradient of the landfill. Chloroethane, along with 1,1,1-trichloroethane and 1,1-dichloroethane, were detected at elevated levels downgradient of the landfill.

Levels of tetrachloroethene, 1,2-dichloroethene and vinyl chloride were detected above groundwater standards in MW-13I located approximately 1,500 feet downgradient of the landfill. However, tetrachloroethene was not detected in any of the samples collected from the groundwater monitoring wells immediately downgradient of the landfill in the intermediate zone.

SVOCs and pesticides/PCBs were not detected above the groundwater standards in any of the intermediate groundwater monitoring wells.

Elevated levels of iron, manganese and sodium were also detected in several of the intermediate wells. The levels of iron and manganese detected in the wells immediately downgradient of the landfill, although lower than the shallow wells, are significantly higher than the levels immediately upgradient of the landfill. None of the wells indicated levels of ammonia (as N) greater than the groundwater standard. Two of the downgradient wells, MW-04I and MW-06I, indicated much higher levels of alkalinity compared to the upgradient wells. Therefore, the intermediate wells located immediately downgradient of the landfill appear to be impacted by leachate emanating from the landfill.

Levels of iron, manganese, conductivity, ammonia (as N) and alkalinity appear to be increasing with depth in the two downgradient monitoring well clusters MW-13 and MW-14. Although the shallow wells at these locations indicated low levels of these constituents, the intermediate wells indicated higher levels (see Figure 4-3). Based on these results, the intermediate depth wells further downgradient of the landfill appear to be impacted by leachate contamination.

Deep Groundwater Quality

The results of the analysis of the groundwater samples collected from the deep groundwater monitoring wells just south of and downgradient of the landfill indicate the presence of elevated levels of VOCs. VOCs exceeding groundwater standards are presented on Figure 4-2. The groundwater sample collected from MW-03D exhibited the presence of 1,1-dichloroethene, 1,1-dichloroethane and 1,1,1-trichloroethane above standards. Chloroethane and 1,2-dichloroethene was detected above standards in the groundwater sample collected from monitoring well MW-04D.

However, samples collected from MW-1D and MW-10D upgradient of these wells also indicated the presence of elevated levels of VOCs. 1,1,1-Trichloroethane and 1,1-dichloroethane were detected at levels above groundwater standards in monitoring well MW-01D and 1,1-dichloroethane was detected above the standard in MW-10D.

Significantly elevated levels of VOCs were detected in MW-06D. Tetrachloroethene, trichloroethene, 1,2-dichloroethene and vinyl chloride were detected in this sample. Tetrachloroethene was detected at 1,200 ug/l and 1,2 dichloroethene was detected at 480 ug/l. 1,1,1-Trichloroethane was also detected in this sample. An upgradient sample collected from MW-07D also indicated the presence of elevated levels of tetrachloroethene and 1,2-dichloroethene.

Samples collected from the monitoring wells further downgradient from the landfill also indicated the presence of a few of these compounds. MW-13D and MW-14D indicated the presence of vinyl chloride and 1,2-dichloroethene above groundwater standards.

The only SVOC detected above the groundwater standards/guidelines was phenol at 4 ug/l at MW-04D. Pesticides and PCBs were not detected above the groundwater standards/ guidelines in any of the deep monitoring wells.

The results of the metals analysis indicated extremely elevated levels of manganese and sodium in upgradient well MW-10D at 36,100 ug/l and 628,000 ug/l, respectively. This well also indicated an elevated conductivity level of 4.83 eV. This conductivity level is higher than the conductivity readings obtained from the shallow and intermediate wells in the MW-10 cluster. Monitoring well MW-05D, which is downgradient of MW-10D, also indicated the presence of an elevated level of manganese at 17,200 ug/l and a relatively elevated conductivity level of 0.630 eV. With the exception of MW-04D, which exhibited elevated levels of iron, manganese and conductivity, the deep monitoring wells immediately downgradient of the landfill do not appear to be impacted by leachate migrating from the landfill.

Although elevated levels of VOCs and select leachate parameters, including iron and manganese, were detected in MW-06D, other leachate parameters such as ammonia (as N) and alkalinity were detected at low levels. Conductivity for this well was also very low and comparable to background. Since this well does not appear to be significantly impacted by leachate from the landfill, the VOCs detected in this well are likely attributable to an upgradient source. The likely source of this contamination is discussed below.

Similar to the discussion presented above for intermediate groundwater quality, with regard to the two wells further downgradient from the landfill, the deep wells in clusters MW-13 and MW-14 appear to be impacted by upgradient sources and landfill leachate as evidenced by elevated levels of conductivity, alkalinity, iron, manganese, and ammonia (as N). (see Figure 4-3).

4.2.5.2 - Round 2 Groundwater Sampling

The second round of groundwater samples, which were analyzed only for volatile organic compounds, identified as the contaminants of concern based on the initial round of groundwater sampling, indicated fairly similar results as compared to the first round, except for the deep monitoring wells at locations MW-01 and MW-07. A comparison of the VOCs exceeding groundwater standards is illustrated in Figure 4-2.

For monitoring well MW-01D, which is located in the northwest corner of the landfill, the first round results indicated a total VOC concentration of 84 ug/l as compared to the second round results which indicated total VOCs of 227 ug/l, with the greatest increase attributed to 1,1,1-trichloroethane (66 ug/l as compared to 170 ug/l). For well MW-07D, which is located in the northeast corner of the landfill, the first round results indicated a total VOC concentration of 38 ug/l as compared to the second round results which indicated total VOCs of 468 ug/l, with the greatest increases attributed to tetrachloroethene (21 ug/l as compared to 270 ug/l), trichloroethene (nondetected as compared to 50 ug/l) and 1,2-dichloroethene (12 ug/l as compared to 140 ug/l). Since elevated levels of leachate parameters were not detected in these two wells, the second round of VOC results further indicate the presence of sources of groundwater contamination upgradient of the landfill.

4.2.6 Supplemental Soil Investigation

The analytical results of the soil investigation conducted in the area of stressed vegetation and tar-like material is provided in Tables 4-23 through 4-26. Based on these results, no volatile organics, pesticides or PCBs exceeded the NYSDEC soil cleanup objectives; however, a few

Table 4-23

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2') 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2') 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
Chloromethane			10 U	11 U	13 U	11 U
Vinyl Chloride		200	10 U	11 U	13 U	11 U
Bromomethane			10 U	11 U	13 U	11 U
Chloroethane		1900	10 U	11 U	13 U	11 U
1,1-Dichloroethene		400	10 U	11 U	13 U	11 U
Carbon Disulfide		2700	10 U	11 U	13 U	11 U
Acetone		200	24	19	13 U	11 U
Methylene Chloride		100	4 JB	4 JB	15 B	4 JB
1,2-Dichloroethene (total)		300	10 U	11 U	13 U	11 U
1,1-Dichloroethane		200	10 U	11 U	13 U	11 U
Chloroform		300	10 U	11 U	13 U	11 U
1,2-Dichloroethane		100	10 U	11 U	13 U	11 U
2-Butanone		300	10 U	11 U	13 U	11 U
1,1,1-Trichloroethane		800	11 J	11 U	14	2 J
Carbon Tetrachloride		600	10 U	11 U	13 U	11 U
Trichloroethene		700	10 U	11 U	13 U	11 U
Benzene		60	10 U	11 U	13 U	11 U
1,2-Dichloropropane			10 U	11 U	13 U	11 U
Bromodichloromethane			10 U	11 U	13 U	11 U
cis-1,3-Dichloropropene			10 U	11 U	13 U	11 U
trans-1,3-Dichloropropene			10 U	11 U	13 U	11 U
1,1,2-Trichloroethane			10 U	11 U	13 U	11 U
Dibromochloromethane			10 U	11 U	13 U	11 U
Bromoform			10 U	11 U	13 U	11 U
4-Methyl-2-pentanone		1000	10 U	11 U	13 U	11 U
Toluene		1500	10 U	11 U	13 U	11 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent not detected B: Compound also found in blank J: Concentration was < CRDL, value estimated

Table 4-23

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
VOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2') 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2') 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
Tetrachloroethene		1400	10 U	11 U	13 U	11 U
2-Hexanone			10 U	11 U	13 U	11 U
Chlorobenzene		1700	10 U	11 U	13 U	11 U
Ethylbenzene		5500	10 U	11 U	13 U	11 U
Xylene (total)		1200	10 U	11 U	13 U	11 U
Styrene			10 U	11 U	13 U	11 U
1,1,2,2-Tetrachloroethane		600	10 U	11 U	13 U	11 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit NA=Not analyzed

U:Constituent not detected B:Compound also found in blank J: Concentration was <CRDL, value estimated

Table 4-24

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2") 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2") 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
Phenol		30	440 U	370 U	420 U	370 U
Bis(2-chloroethyl)ether			440 U	370 U	420 U	370 U
2-Chlorophenol		800	440 U	370 U	420 U	370 U
1,3-Dichlorobenzene		1600	440 U	370 U	420 U	370 U
1,4-Dichlorobenzene		8500	440 U	370 U	420 U	370 U
1,2-Dichlorobenzene		7900	440 U	370 U	420 U	370 U
2-Methylphenol		100	440 U	370 U	420 U	370 U
2,2'-oxybis(1-chloropropane)			440 U	370 U	420 U	370 U
4-Methylphenol		900	440 U	370 U	420 U	370 U
N-Nitroso-di-n-propylamine			440 U	370 U	420 U	370 U
Hexachloroethane			440 U	370 U	420 U	370 U
Nitrobenzene		200	440 U	370 U	420 U	370 U
Isophorone		4400	440 U	370 U	420 U	370 U
2-Nitrophenol		330	440 U	370 U	420 U	370 U
2,4-Dimethylphenol			440 U	370 U	420 U	370 U
Bis(2-chloroethoxy)methane			440 U	370 U	420 U	370 U
2,4-Dichlorophenol		400	440 U	370 U	420 U	370 U
1,2,4-Trichlorobenzene		3400	440 U	370 U	420 U	370 U
Naphthalene		13000	120 J	370 U	160 J	370 U
4-Chloroaniline		220	440 U	370 U	420 U	370 U
Hexachlorobutadiene			440 U	370 U	420 U	370 U
4-Chloro-3-methylphenol		240	440 U	370 U	420 U	370 U
2-Methylnaphthalene		36400	78 J	370 U	96 J	370 U
Hexachlorocyclopentadiene			440 U	370 U	420 U	370 U
2,4,6-Trichlorophenol			440 U	370 U	420 U	370 U
2,4,5-Trichlorophenol		100	1100 U	910 U	1000 U	910 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent not detected D: Result taken from diluted run J: Concentration was < CRDL, value estimated

Table 4-24

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE		TT-35	TT-35	TT-35A	TT-35A
	SAMPLE ID	NYSDEC SOIL	TT-35(0-2")	TT-35(1-2')	TT-35A(0-2")	TT-35A(1-2')
	DATE	CLEANUP	01/14/98	01/14/98	01/14/98	01/14/98
	DEPTH (ft)	OBJECTIVES	0.20	2.00	0.20	2.00
2-Chloronaphthalene			440 U	370 U	420 U	370 U
2-Nitroaniline		430	1100 U	910 U	1000 U	910 U
Dimethyl Phthalate		2000	440 U	370 U	420 U	370 U
Acenaphthylene		41000	100 J	370 U	78 J	370 U
2,6-Dinitrotoluene		1000	440 U	370 U	420 U	370 U
3-Nitroaniline		500	1100 U	910 U	1000 U	910 U
Acenaphthene		50000	440 U	370 U	420 U	370 U
2,4-Dinitrophenol		200	1100 U	910 U	1000 U	910 U
4-Nitrophenol		100	1100 U	910 U	1000 U	910 U
Dibenzofuran		6200	440 U	370 U	420 U	370 U
2,4-Dinitrotoluene			440 U	370 U	420 U	370 U
Diethylphthalate		7100	440 U	370 U	420 U	370 U
Fluorene		50000	440 U	370 U	420 U	370 U
4-chlorophenyl-phenylether			440 U	370 U	420 U	370 U
4-Nitroaniline			1100 U	910 U	1000 U	910 U
4,6-Dinitro-2-methylphenol			1100 U	910 U	1000 U	910 U
N-Nitrosodiphenylamine			72 J	370 U	420 U	370 U
4-Bromophenyl Phenylether			440 U	370 U	420 U	370 U
Hexachlorobenzene		410	440 U	370 U	420 U	370 U
Pentachlorophenol		1000	1100 U	910 U	1000 U	910 U
Phenanthrene		50000	170 J	130 J	240 J	45 J
Anthracene		50000	69 J	370 U	110 J	370 U
Carbazole			440 U	50 J	420 U	370 U
Di-n-butylphthalate		8100	440 U	370 U	420 U	370 U
Fluoranthene		50000	240 J	260 J	330 J	120 J
Pyrene		50000	400 J	210 J	790	130 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent not detected D: Result taken from diluted run J: Concentration was < CRDL, value estimated

Table 4-24

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
SEMIVOLATILE ORGANIC RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2") 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2") 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
Butylbenzylphthalate		50000	100 J	51 J	420 U	68 J
Benzo(a)anthracene		224	160 J	110 J	220 J	80 J
3,3'-Dichlorobenzidine			440 U	370 U	420 U	370 U
Chrysene		400	370 J	130 J	[450]	88 J
Bis(2-ethylhexyl)phthalate		50000	290 J	110 J	270 J	12000 D
Di-n-octylphthalate		50000	440 U	370 U	420 U	370 U
Benzo(b)fluoranthene		1100	500	130 J	480	100 J
Benzo(k)fluoranthene		1100	390 J	130 J	290 J	93 J
Benzo(a)pyrene		61	[260] J	[140] J	[200] J	[88] J
Indeno(1,2,3-cd)pyrene		3200	220 J	81 J	130 J	49 J
Dibenzo(a,h)anthracene		14	440 U	370 U	420 U	370 U
Benzo(g,h,i)perylene		50000	280 J	95 J	230 J	58 J

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Constituent not detected D: Result taken from diluted run J: Concentration was < CRDL, value estimated

Table 4-25

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
PESTICIDE/PCB RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2') 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2') 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
alpha-BHC		110	2.3 U	1.9 U	1.7 JP	1.9 U
beta-BHC		200	2.3 U	1.9 U	2.2 U	1.9 U
delta-BHC		300	2.3 U	1.9 U	2.2 U	1.9
gamma-BHC (Lindane)		540	2.3 U	1.9 U	2.2 U	1.9 U
Heptachlor		100	2.3 U	1.9 U	2.2 U	1.9 U
Aldrin		41	2.3 U	1.9 U	2.2 U	1.9 U
Heptachlor Epoxide		20	2.3 U	1.9 U	2.2 U	1.9 U
Endosulfan I		900	2.3 U	1.9 U	2.2 U	1.9 U
Dieldrin		44	3.1 JP	3.7 U	4.2 U	3.7 U
4,4'-DDE		2100	2.8 JP	3.7 U	4.2 U	3.7 U
Endrin		100	4.4 U	3.7 U	4.2 U	3.7 U
Endosulfan II		900	4.4 U	3.7 U	4.2 U	3.7 U
4,4'-DDD		2900	3.0 JP	3.7 U	4.2 U	2.1 JP
Endosulfan Sulfate		1000	5	3.7 U	4.2 U	3.7 U
4,4'-DDT		2100	4.3 JP	3.7 U	(3.8) P	3.7 U
Methoxychlor			23 U	19 U	22 U	19 U
Endrin Ketone			4.4 U	3.7 U	4.2 U	3.7 U
Endrin Aldehyde			4.4 U	3.7 U	4.2 U	3.7 U
alpha-Chlordane			18 P	2.2 P	13 P	13.4 P
gamma-Chlordane			12 P	1.9 P	9.4 P	10.6
Toxaphene			230 U	190 U	220 U	190 U
Aroclor 1016			44 U	37 U	42 U	37 U
Aroclor 1221			89 U	76 U	86 U	76 U
Aroclor 1232			44 U	37 U	42 U	37 U
Aroclor 1242			44 U	37 U	42 U	37 U
Aroclor 1248			44 U	37 U	42 U	37 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
() = Less than Reporting Limit
U: Constituent not detected J: Concntration < CRDL P: Difference in concentrations > 25%, lower value reported

Table 4-25

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
PESTICIDE/PCB RESULTS

Date: 05/01/98

CONSTITUENT (Units in ug/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2') 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2") 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
Aroclor 1254			29 JP	37 U	42 U	37 U
Aroclor 1260			44 U	37 U	42 U	19 JP

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed

U: Constituent not detected J: Concntration < CRDL P: Difference in concentrations > 25%, lower value reported

Table 4-26

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUPPLEMENTAL SOIL SAMPLING
METAL RESULTS

Date: 05/01/98

CONSTITUENT (Units in mg/kg)	SITE SAMPLE ID DATE DEPTH (ft)	NYSDEC SOIL CLEANUP OBJECTIVES	TT-35 TT-35(0-2') 01/14/98 0.20	TT-35 TT-35(1-2') 01/14/98 2.00	TT-35A TT-35A(0-2') 01/14/98 0.20	TT-35A TT-35A(1-2') 01/14/98 2.00
Aluminum			2830	1000	3860	3340
Antimony			1.6 B	0.87 B	4.2 B	0.68 B
Arsenic		7.5	4.2	3.3	6.3	2.2 B
Barium		300	33.5 B	6.8 B	29.1 B	30.6 B
Beryllium		0.16	[0.20] B	0.05 B	0.11 B	[0.20] B
Cadmium		10	1.0 B	0.05 U	2.1	0.39 B
Calcium			7300	470 B	2160	3820
Chromium		50	12.5	30.7	41.8	22.6
Cobalt		30	11.7 B	0.86 B	[50.1]	2.9 B
Copper		25	[34.7]	[25.7]	[262]	[41.2]
Iron		2000	[22800]	[4770]	[29100]	[9220]
Lead		400	172	49.8	137	88.1
Magnesium			2020	225 B	870 B	2100
Manganese			122	49.2	513	67.8
Mercury		0.10	[0.12]	0.05 B	[0.10] B	[0.12]
Nickel		13	7.2 B	[14.1]	[15.9]	11.7
Potassium			246 B	99.7 B	310 B	170 B
Selenium		2	0.85 B	0.54 U	[2.7]	0.54 U
Silver			1.2 B	0.18 U	0.21 U	0.18 U
Sodium			135 B	285 B	273 B	68 B
Thallium			0.51 U	0.43 U	0.65 B	0.43 U
Vanadium		150	10.6 B	3.7 B	15.1	13.3
Zinc		20	[2870]	[25.9]	[10600]	[110]
Cyanide			0.67 U	0.57 U	0.64 U	0.57 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit NA = Not analyzed
[] = Greater than Action Level
U: Constituent not detected
B: Concentration is > IDL but < CRDL

semivolatile organic compounds slightly exceeded the soil cleanup objectives for chrysene (maximum concentration of 450 ug/kg as compared to the cleanup objective of 400 ug/kg) and benzo(a)pyrene (maximum concentration of 260 ug/kg as compared to the cleanup objective of 61ug/kg). In addition, a few metals exceeded the soil cleanup objective, these being the following: beryllium (maximum of 0.20 mg/kg vs. the cleanup objective of 0.16 mg/kg); cobalt (maximum of 50.1 mg/kg vs. 30 mg/kg); copper (maximum 262 mg/kg vs. 25 mg/kg); iron (maximum of 29,100 mg/kg vs. 2,000 mg/kg); mercury (maximum of 0.12 mg/kg vs. 0.10 mg/kg); nickel (maximum of 15.9 mg/kg vs. 13 mg/kg); selenium (maximum of 2.7 mg/kg vs. 2.0 mg/kg); and zinc (maximum of 10,600 mg/kg vs. 20 mg/kg).

While the metals contaminants are elevated, in particular iron and zinc, these contaminated soils extend only to about a few inches below ground surface and will be capped as part of the Presumptive Remedy for the Sonia Road Landfill. Construction workers will be protected from contact with these soils as part of the Construction Health and Safety Plan.

4.2.7 Other Contaminant Sources

Although levels of volatile organic compounds were detected in monitoring wells immediately downgradient of the landfill above groundwater standards, since these wells did not exhibit elevated levels of leachate parameters, the VOC contamination appears to be migrating from an upgradient source or sources. Several potential sources of contamination were discussed in Section 1.0. A summary of the potential sources and the contaminants detected at these sites is presented in Table 4-27. The location of these potential sources in relation to the Sonia Road Landfill is presented on Figure 4-4.

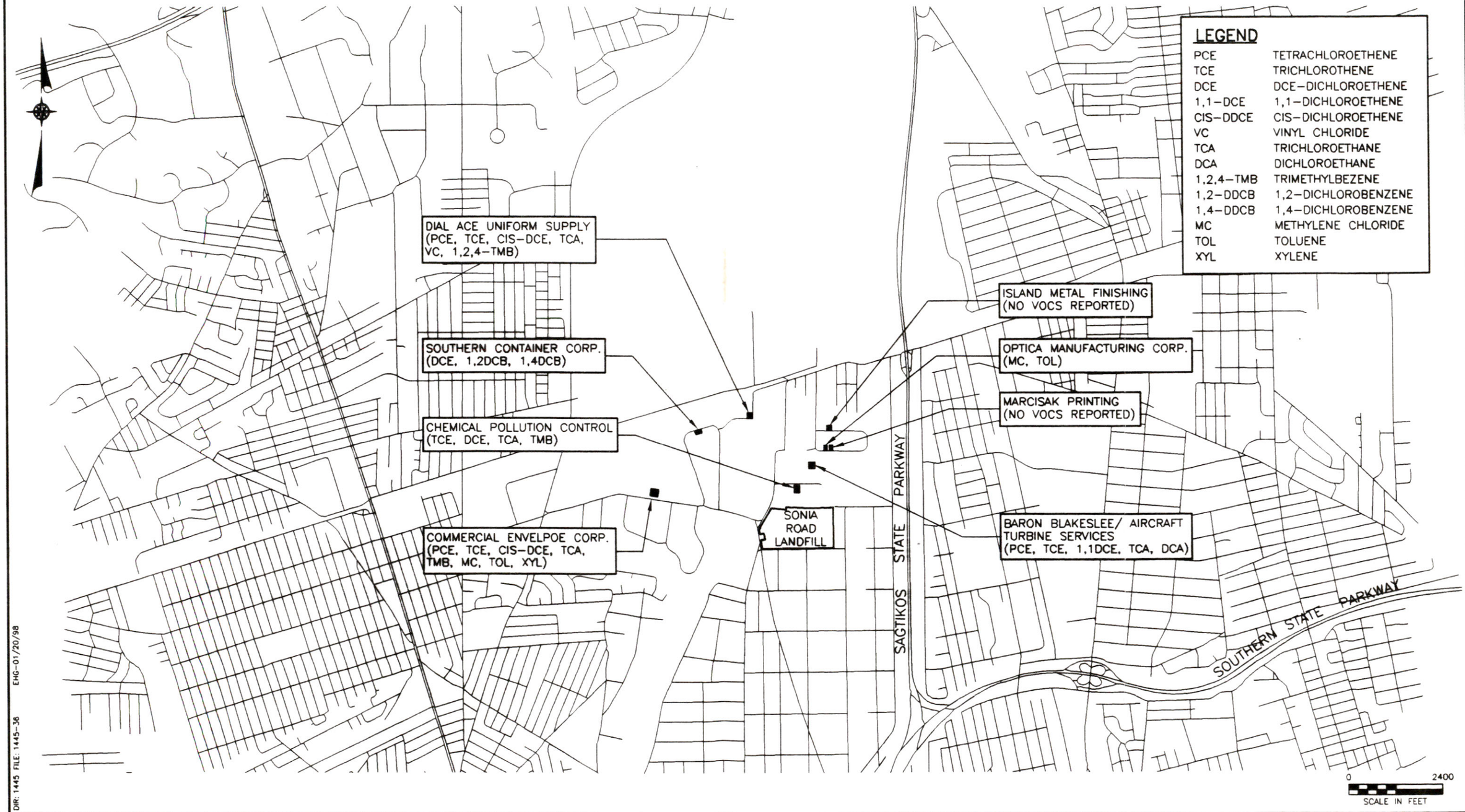
While the exact source or sources of this contamination is unknown, based on existing background information, the elevated levels of tetrachloroethene, trichloroethene, 1,2-dichloroethene and vinyl chloride detected in the deep wells along the eastern portion of the landfill, in particular, MW-06D, are likely the result of contamination migrating from the Baron Blakeslee/Aircraft Turbine site located upgradient of this well. Previous investigations of the

Table 4-27

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF POTENTIAL UPGRADIENT
SOURCE CONTAMINANT INFORMATION

Site	PCE	TCE	DCE	TCA	DCA	VC	TMB	MC	BEN	TOL	XYL	1,2 DCB	1,4 DCB
Baron Blakeslee, Inc. (dry well)	66,000	410,000	>10,000 (1,1)	2,700,000	>10,000 (1,1)								
(off-site wells)	140	110	4,200	950	290 (1,1)								
Dial Ace Uniform (cesspool)	2,900	1,200					37,000 (1,2,4)						
(wells)		130	92 (cis)	110		9							
Chemical Pollution Control (wells)		304	6.4(1,2)	188	116				216				
Commercial Envelope (leaching pools)	73		160 (cis)	150			190 (1,3,5)	2,100		970	550		
Southern Container (wells)			610(1,2)										
(leaching pool)												2,700	590
Optica Manuf. (cesspool)								180		65			
Marcisak Printing	No VOCs Reported												
Island Metal Finishing	No VOCs Reported												

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene (1,1; 1,2; cis)
TCA - 1,1,1 Trichloroethane
DCA - Dichloroethane
VC - Vinyl Chloride
TMB - Trimethylbenzene (1,2,4; 1,3,5)
MC - Methylene Chloride
BEN - Benzene
TOL - Toluene
XYL - Xylene
1,2 DCB - 1,2 dichlorobenzene
1,4 DCB - 1,4 Dichlorobenzene
All values in ppb



DIR: 1445 FILE: 1445-36 ENG-01/20/98

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

POTENTIAL UPGRADIENT SOURCES AND CONTAMINANTS OF CONCERN

FIGURE 4-4

Baron Blakeslee site have shown a plume of contaminated groundwater migrating from this site to beneath the northeastern corner of the Sonia Road Landfill, which comprises the same contaminants as detected in 6D (see Figure 1-10).

As shown on Table 4-27, investigations at the Dial Ace Uniform and Chemical Pollution Control sites have also indicated the presence of VOCs in samples collected from the sites by others which could also be impacting groundwater in the vicinity and downgradient of the landfill. Groundwater samples in the vicinity of Dial Ace Uniform indicated the presence of tetrachloroethene, trichloroethene, dichloroethene, 1,1,1 trichloroethane and vinyl chloride. Groundwater samples collected from monitoring wells on Chemical Pollution Control site indicated the presence of trichloroethene, dichloroethene and 1,1,1 trichloroethane. Monitoring well clusters MW-2, MW-7 and MW-6 are all located downgradient of this site. The elevated levels of VOCs detected in the MW-7 and MW-6 clusters may be attributed in part to this site.

The elevated level of 1,1,1-trichloroethane in MW-03D is likely migrating from a source in the Industry Court located upgradient of the MW-10 cluster. Elevated levels of 1,1,1-trichloroethane and its breakdown product, 1,1-dichloroethane, were consistently detected in the shallow intermediate and deep wells upgradient of the landfill. Although Southern Container Corporation has been identified as a potential upgradient source, based upon the information obtained to date on this site, 1,1,1-trichloroethane has not detected at the Southern Container site.

Although there is volatile organic chemical contamination in the vicinity of the Sonia Road Landfill, since it is likely not attributable to contaminant releases from the landfill, but rather related to upgradient industrial sources, groundwater is not a medium of concern relative to the landfill. However, since it could pose a potential threat to human health, further evaluation of groundwater contamination will be addressed in the risk assessment. Leachate contamination will be mitigated by implementation of the Presumptive Remedy selected for the site (capping).

4.3 Data Validation

As part of the field program for the remedial investigation at the Sonia Road Landfill, the following environmental samples were collected: seven surface soil; four soil boring subsurface soil; six soil vapor; sixty-five Hydropunch groundwater; and thirty-six monitoring well groundwater. The surface soil samples, two soil boring samples and the monitoring well groundwater samples were analyzed for TCL +30 parameters, TAL metals and cyanide. Two of the soil boring samples were analyzed for TCLP parameters, and the soil vapor samples were analyzed for TCL VOCs. All of the Hydropunch groundwater samples were analyzed for select chlorinated VOCs by a portable gas chromatograph (GC) with seven samples (10%) being sent to a laboratory for confirmatory TCL VOC analysis. The soil boring, monitoring well and confirmatory Hydropunch sample analyses were performed by H2M Labs, Inc.; the surface soil and soil vapor samples were analyzed by IEA, Inc.; and the portable GC analysis was performed by Dvirka and Bartilucci Consulting Engineers (D&B). All laboratory sample analyses were performed in accordance with 10/95 New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) methods and requirements.

The data packages submitted by H2M and IEA were validated by Nancy Potak, a subcontractor to D&B. The findings of Ms. Potak's validation reports are summarized below by sample matrix and analytical fraction. Copies of the validation reports are contained in Appendix S.

Surface Soil

The volatile organic analysis of the surface soils was performed in accordance with NYSDEC ASP Method 95-1 within the specified holding time. The acetone results for samples SS-1, SS-2, SS-3, SS-6 and SS-7 have been qualified as nondetectable due to laboratory contamination. That is, the method blank associated with these samples also contained acetone and the sample concentrations were less than five times the blank concentration.

The semivolatile fraction of SS-5 was re-extracted one day out of the five-day holding time. Re-extraction was required due to no surrogate recovery in the original sample. The surrogate recoveries in the re-extract were within the quality control (QC) limits; therefore, the data from the re-extract is considered the most compliant and should be utilized for environmental assessment. All other samples were analyzed within the specified holding time.

The diethylphthalate, di-n-butylphthalate and bis(2-ethylhexyl)phthalate results in samples SS-2, SS-3, SS-5, SS-6 and SS-7, and diethylphthalate and di-n-butyl-phthalate results in SS-4, have been qualified as nondetectable due to laboratory contamination. That is, the method blank associated with those samples also contained those compounds and the sample concentrations were less than five times the concentration found in the blank.

The pesticide/PCB analyses were performed within the specified holding times and in accordance with ASP Method 95-3. Based on the laboratory analyst's judgment, alpha chlordane was reported to be in samples SS-1, SS-4 and SS-5, even though the peak was outside the retention time window. No qualification of the data is required, since the presence of alpha chlordane does not impact the assessment of the site.

All metals analyses were performed in accordance with Superfund inorganics methods. The cadmium results have been qualified as estimated, possibly biased low with false negatives being reported.

The surface soil results are deemed valid and usable for environmental assessment.

Subsurface Soil (Soil Borings)

The volatile organic results for the subsurface soil samples have been deemed valid and usable with the exception of the methylene chloride results in SB-01 and SB-04. Methylene chloride has been qualified as nondetectable due to laboratory (blank) contamination.

Samples SB-01 and SB-04 required reanalysis of the semivolatile fraction at secondary dilutions due to the concentration of bis(2-ethylhexyl)phthalate exceeding the instrument calibration range. All data should be taken from the diluted run, with the exception of bis(2-ethylhexyl)phthalate, which should be taken from the initial runs.

Sample SB-1-01 also required reanalysis of the pesticide/PCB fraction at a secondary dilution (1:100) due to levels of pesticides and PCBs above the calibration linear range. Heptachlor epoxide coelutes with Aroclor 1016 and Aroclor 1242; therefore, the result has been qualified as highly estimated. The laboratory indicated that the patterns for Aroclor 1016 and 1242 were nondistinguishable; therefore, the entire PCB concentration was reported as Aroclor 1242.

The chromium result for SB-01 has been qualified as rejected due to the high spike recovery (246%) of chromium, as required by validation criteria.

No qualification of the TCLP results for SB-02 and SB-03 were required.

All soil boring results were deemed valid and usable for environmental assessment.

Groundwater (Hydropunch)

Seven of the Hydropunch groundwater samples were analyzed in accordance with ASP Method 95-1 to serve as confirmation of the portable GC analysis.

The acetone and methylene chloride results in GWH2-03 have been qualified as nondetectable due to laboratory (method blank) contamination.

The data from the portable GC analysis did not undergo a validation process since it was utilized as a screening tool; however, the data was reviewed and evaluated based upon the QC

samples (syringe blanks, system blanks and calibrations) analyzed. The Hydropunch GC data should not be utilized for environmental assessment without qualification.

The vinyl chloride results for all samples have been qualified since the vinyl chloride peak elutes at the same time as the ejection peak and, therefore, appears to be present in the syringe blanks analyzed daily, as well as the samples. Based upon review, all vinyl chloride results less than 1 ug/l can be qualified as nondetectable with all other concentrations being qualified as estimated.

The results from the laboratory confirmatory samples were compared to the portable GC results for the corresponding sample as presented in Table 4-28. As shown in this table, the largest discrepancy involves the 1,1-dichloroethane results. This compound was reported in the portable GC results; however, it was not found at elevated levels in any of the confirmation samples. The highest 1,1-dichloroethane GC result with a confirmatory laboratory sample was 448 ppb in GWH7-03 and the laboratory sample did not contain any 1,1-dichloroethane. This discrepancy may be due to a non-targeted (i.e., inorganic or non-chlorinated organic) compound being present with the same retention time as 1,1-dichloroethane.

The portable GC chloroethane results for GWH7-03 were comparable with the laboratory results, with possibly the GC data being biased low.

Groundwater (Monitoring Well)

All monitoring well groundwater samples were analyzed within the method specified holding times with the exception of the semivolatile fraction of MW-11D, MW-11I, MW-11S, MW-12D, MW-12I and MW-12S, which was extracted one day outside of the 5-day holding time. The semivolatile results for the above samples have been qualified as estimated.

Bis(2-ethylhexyl)phthalate has been qualified as nondetectable in samples MW-13I, MW-14D, MW-14I, MW-05D and MW-05I due to laboratory (method blank) contamination.

TABLE 4-28
SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH GROUNDWATER SAMPLING RESULTS
COMPARISON OF VOLATILE ORGANICS - PORTABLE GC AND LABORATORY

ANALYSIS	PORT. GC	LAB	PORT. GC	LAB	PORT. GC	LAB	
SAMPLE IDENTIFICATION	GW-H1-08	GW-H1-08	GW-H2-03	GW-H2-03	GW-H4-01	GW-H4-01	NYSDEC CLASS GA
DATE OF COLLECTION	08/25/97	08/25/97	08/27/97	08/27/97	09/05/97	09/05/97	GROUNDWATER
SAMPLE DEPTH	93 feet	93 feet	43 feet	43 feet	26 feet	26 feet	STANDARD/GUIDELINE
DILUTION FACTOR	1	1	1	1	1	1	
VOLATILE ORGANICS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Vinyl Chloride	1.05 B	ND	ND	ND	ND	ND	2 ST
Chloroethane	ND	ND	ND	4.00 J	ND	7.00 J	5 ST
1,1-Dichloroethene	0.04	ND	ND	ND	ND	ND	5 ST
1,1-Dichloroethane	ND	1.00 J	ND	ND	38.84	ND	5 ST
trans - 1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	5 ST
cis - 1,2-Dichloroethene	ND	ND	ND	ND	0.44	ND	5 ST
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	5 ST
Trichloroethene	ND	ND	ND	ND	ND	ND	5 ST
Benzene	ND	ND	ND	ND	ND	ND	0.7 ST
Tetrachloroethene	0.05	ND	ND	ND	ND	ND	5 ST
Chlorobenzene	ND	ND	ND	1.00 J	ND	1.00 J	5 ST
Total Xylenes	ND	ND	ND	1.00 J	ND	ND	5 ST*
TOTAL VOCs	1	1	0.00	6.00	39.28	8.00	

ANALYSIS	PORT. GC	LAB	PORT. GC	LAB	PORT. GC	LAB	
SAMPLE IDENTIFICATION	GW-H4-07	GW-H4-07	GW-H5-09	GW-H5-09	GW-H6-05	GW-H6-05	NYSDEC CLASS GA
DATE OF COLLECTION	09/19/97	09/19/97	09/16/97	09/16/97	09/22/97	09/22/97	GROUNDWATER
SAMPLE DEPTH	86 feet	86 feet	105 feet	105 feet	67 feet	67 feet	STANDARD/GUIDELINE
DILUTION FACTOR	1	1	1	1	1	1	
VOLATILE ORGANICS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Vinyl Chloride	ND	ND	ND	ND	ND	ND	2 ST
Chloroethane	ND	ND	ND	ND	ND	ND	5 ST
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	5 ST
1,1-Dichloroethane	ND	1.00 J	ND	ND	ND	ND	5 ST
trans - 1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	5 ST
cis - 1,2-Dichloroethene	0.55	ND	ND	ND	0.27	ND	5 ST
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	5 ST
Trichloroethene	22.13	ND	34.04	ND	ND	ND	5 ST
Benzene	ND	ND	ND	ND	ND	ND	0.7 ST
Tetrachloroethene	4.37	11.00	0.10	ND	ND	ND	5 ST
Chlorobenzene	ND	ND	ND	ND	ND	ND	5 ST
Total Xylenes	ND	ND	ND	ND	ND	ND	5 ST*
TOTAL VOCs	27.05	12.00	34.14	0.00	0.27	0.00	

QUALIFIERS
B: Sample concentration has been corrected based on concentration found in blank
ND: Not detected
J:Concentration detected was below CRDL, value estimated

NOTES
GV: Guidance Value
ST: Standard
: Value exceeds standard/guideline
—: Not established
*: Applies to each isomer individually

TABLE 4-28
SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HYDROPUNCH GROUNDWATER SAMPLING RESULTS
COMPARISON OF VOLATILE ORGANICS - PORTABLE GC AND LABORATORY

ANALYSIS	PORT. GC	LAB					NYSDEC CLASS GA GROUNDWATER STANDARD/GUIDELINE
SAMPLE IDENTIFICATION	GW-H7-03	GW-H7-03					
DATE OF COLLECTION	09/10/97	09/10/97					
SAMPLE DEPTH	47 feet	47 feet					
DILUTION FACTOR	1	1					
VOLATILE ORGANICS	(ug/l)	(ug/l)					(ug/l)
Vinyl Chloride	ND	ND					2 ST
Chloroethane	205.00	360.00 D					5 ST
1,1-Dichloroethene	ND	ND					5 ST
1,1-Dichloroethane	448.00	ND					5 ST
trans - 1,2-Dichloroethene	ND	ND					5 ST
cis - 1,2-Dichloroethene	12.49	ND					5 ST
1,1,1-Trichloroethane	ND	ND					5 ST
Trichloroethene	ND	ND					5 ST
Benzene	ND	ND					0.7 ST
Tetrachloroethene	ND	ND					5 ST
Chlorobenzene	ND	2.00 J					5 ST
Total Xylenes	ND	1.00 J					5 ST*
TOTAL VOCs	665.49	363.00					

QUALIFIERS
ND: Not detected
B: Sample concentration has been corrected based on concentration found in blank
D: Result taken from secondary dilution
J:Concentration detected was below CRDL, value estimated

GV: Guidance Value
ST: Standard
[ ]: Value exceeds standard/guideline
—: Not established
*: Applies to each isomer individually

Sample MW-06D required reanalysis of the volatile fractions at a secondary dilution due to the concentration of 1,2-dichloroethene and tetrachloroethene exceeding the instrument calibration range. The results for these two compounds should be taken from the diluted analysis, with all others coming from the initial undiluted run.

The pesticide/PCB results for MW-07I have been rejected due to surrogate (DCB) recoveries less than 10% on both columns; however, since no pesticides/PCBs were found in any of the other groundwater results, the data can be considered usable for environmental assessment.

The concentration of total dissolved solids (TDS) was calculated as 246 ug/l during the validation procedure, not 123 ug/l as originally reported. The laboratory was contacted and has submitted revised report forms.

All metal results for the monitoring well samples are considered valid and usable with no qualification of the results required.

All monitoring well results have been deemed valid and usable for environmental assessment as qualified above.

5.0 CONTAMINANT FATE AND TRANSPORT

The purpose of this section is to combine the site physical characteristics, including geology and hydrogeology, with the nature and extent of contamination in order to analyze the fate and transport of contaminants at the Sonia Road Landfill and in the study area. In order to determine the fate and transport of the contaminants, the persistence of the contaminants detected in the media of concern and the ability of those contaminants to migrate will be evaluated. Provided below is a discussion of the contaminants of concern in the media analyzed during the remedial investigation.

5.1 Contaminant Persistence

Table 5-1 provides physical and chemical properties of the contaminants of concern detected at the Sonia Road Landfill site that relate to the contaminants' ability to persist and migrate in the environment. The persistence and mobility values for each of the contaminants is accompanied by a value score designated by a (0), which represents low persistence or mobility, (5), which represents moderate mobility and (10), which represents high persistence or mobility. As indicated on the table, the total score is a measure of the contaminants' overall persistence and mobility in the environment. While all persistence and mobility values are available for the organic contaminants, not all values are available or applicable for a number of properties associated with the inorganic contaminants. These persistence and mobility values were obtained from information provided in the Massachusetts Contingency Plan and Indiana Voluntary Remediation Program Resource Guide which is provided in Appendix R.

In Table 5-1, the property primarily related to persistence is degradation potential, which refers to a contaminant's ability to retain its chemical composition. A persistent chemical is resistant to biological degradation and chemical reaction and will remain in the environment in its existing form for a substantial period of time. Solubility is a measure of a contaminant's ability to dissolve in water. With regard to the Sonia Road Landfill, solubility is primarily relevant to the release of contaminants in waste as precipitation percolates through the waste and

Table 5-1

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SUMMARY OF PERSISTENCE AND MOBILITY VALUES
FOR IDENTIFIED CONTAMINANTS OF CONCERN

Contaminant	Solubility (mg/l)		Vapor Pressure (mm Hg)		Octanol-Water Partition Coefficient Kow (mg/l / ug/l)		Degradation Potential		Specific Gravity (at 20°C)		Organic Carbon Partition Coefficient Koc (l/kg)		Total Persistence/ Mobility Score[1]
Vinyl chloride	2.7 E + 03	(10)	2.66 E + 03	(10)	2.4 E + 01	(5)	P	(10)	0.908[2]	(0)	2.4 E + 00	(10)	45
1,1-Dichloroethene	2.3 E + 03	(10)	6.00 E + 02	(10)	6.9 E + 01	(5)	P	(10)	1.250	(10)	6.5 E + 01	(10)	55
1,2-Dichloroethene (cis)	3.5 E + 03	(10)	2.09 E + 02	(10)	5.0 E + 00	(10)	P	(10)	1.27[2]	(10)	4.9 E + 01	(10)	60
Trichloroethene	1.1 E + 03	(10)	5.79 E + 01	(10)	2.4 E + 02	(5)	P	(10)	1.466	(10)	9.6 E + 01	(10)	55
Tetrachloroethene	1.5 E + 02	(5)	1.8 E + 01	(10)	4.0 E + 02	(5)	P	(10)	1.631[3]	(10)	6.7 E + 01	(10)	50
Chloroethane	5.7 E + 03	(10)	34[4]	(5)	3.5 E + 01	(5)	N-P	(0)	0.903	(0)	3.2 E + 00	(10)	30
1,1-Dichloroethane	5.5 E + 03	(10)	1.82 E + 02	(10)	6.2 E + 01	(5)	P	(10)	1.176	(10)	3.0 E + 01	(10)	55
1,1,1-Trichloroethane	1.5 E + 03	(10)	1.23 E + 02	(10)	3.2 E + 02	(5)	P	(10)	1.346[3]	(10)	1.4 E + 02	(10)	55
Ammonia (as NH_4Cl)	3.7 E + 05	(10)	1.3	(10)	NA		P	(10)	1.5	(10)	NA		
Iron (as $Fe[OH]_2$)	6.7 E + 00	(5)	NA		NA		P	(10)	3.4	(10)	NA		
Manganese (as $Mn[OH_2]$)	2.0 E + 01	(5)	NA		NA		P	(10)	3.3	(10)	NA		
Sodium (NaCl)	3.6 E + 05	(10)	NA		NA		P	(10)	2.2	(10)	NA		
Phenol	9.3 E + 04	(10)	3.41 E - 01	(5)	2.9 E + 01	(5)	N-P	(0)	1.071[1]	(10)	2.2 E + 01	(10)	40

Notes:

( ) Value Score: 0 is low; 5 is moderate; and 10 is high
P Persistent
N-P Non Persistent
NA Data not available or not applicable

[1]Total Score: 0-25 is low; 25-45 is moderate; and 45-60 is high
[2]25°C
[3]15°C
[4]Henry's Law Constant in atm m^3 water/m^3 air

Reference: Massachusetts Contingency Plan and Indiana Voluntary Remediation Program Resource Guide

mobility of contaminants in groundwater. Contaminants with high solubilities will readily dissolve in water and migrate in the environment.

Vapor pressure is a measure of a contaminant's ability to volatilize and be released as a gas as soil vapor and to ambient air. Contaminants with high vapor pressures will readily volatilize. Octanol-water partition coefficient is a measure of how hydrophobic a contaminant is—that is how resistant the contaminant is to dissolving in water. With regard to the Sonia Road Landfill, the octanol-water partition coefficient is primarily relevant to mobility of contaminants in groundwater. Contaminants with low octanol-water partition coefficients are more likely to dissolve in groundwater and readily migrate.

Specific gravity is a measure of a contaminant's density/weight relative to water. Contaminants with specific gravities less than 1.0 are lighter than water and will "float" and those with specific gravities greater than 1.0 are heavier than water and will "sink." At the Sonia Road Landfill site, this parameter is relevant to a contaminant's ability to migrate in shallow or to deep groundwater. Organic carbon partition coefficient is a measure of a dissolved contaminant's ability to be released from water onto soil based primarily on the organic content of the soil or aquifer. The higher the organic content of the soil, the more likely the contaminants will be adsorbed onto the soil surface. Contaminants with low organic partition coefficients will be less likely to be partitioned from water to soil and will migrate with groundwater.

Based on the information provided in Table 5-1, except for chloroethane and phenol, the organic chemicals of concern, as well as the inorganic chemicals of concern, are characterized as persistent in the environment. However, although considered persistent and not readily degradable, the chlorinated hydrocarbons, such as the ethenes and ethanes, can be transformed in the environment, including in groundwater, from the original compound to multiple degradation products/compounds. This degradation process can result in the formation of more toxic compounds. For example, tetrachloroethene (human toxicity value of 25) can degrade to trichloroethene (30) to 1,1-dichloroethene (28) to vinyl chloride (chloroethene) (38) (see Appendix R for these toxicity values).

Provided below is a discussion of persistence of contaminants detected at the Sonia Road Landfill as a function of the media investigated.

5.1.1 Soil Vapor/Explosive Gas

During the remedial investigation, volatile organic compounds and methane gas were detected in soil vapor on the Sonia Road Landfill site; however, only methane was detected at elevated levels. In addition, landfill gas monitoring information dating back to 1992 indicates that methane has been detected in two perimeter wells fairly consistently since that time. Municipal solid waste typically continues to produce methane for over 30 years after placement of the waste. Since the landfill accepted waste until 1974, the landfill will continue to generate methane for some time. Methane gas, which does not degrade and is lighter than air, currently vents directly to the atmosphere through the existing soil cover. After construction of the landfill cap, although vents will be installed as part of the cap to allow methane gas to continue to vent to the atmosphere, as a result of the cap, there is an increased potential for methane to migrate off-site in the subsurface soil. Therefore, methane will persist at the Sonia Road Landfill and may migrate further as compared to current conditions.

5.1.2 Surface Soil

Several contaminants, including semivolatile organic compounds (SVOCs) and metals, were detected at slightly elevated levels in the surface soil at the landfill site and off-site, except in the area of stressed vegetation in the central portion of the landfill which exhibited elevated concentrations of iron and zinc. The levels of contaminants detected in the on-site surface soil, exclusive of the area of stressed vegetation, were consistent with background concentrations. These contaminants, in addition to having low degradation potential, are likely background given the industrial nature of the study area north and west of the landfill and, therefore, are expected to persist in the environment.

However, the contaminants in the surface soil, relative to use of the site, are not expected to pose a threat to human health or the environment. While iron and zinc in the area of stressed vegetation are substantially above the NYSDEC soil cleanup objectives, which are established for residential/unrestricted land use, (maximum concentrations of 29,100 mg/kg and 10,600 mg/kg, respectively), the concentrations for these metals are below the Risk-Based Concentrations developed by the United States Environmental Protection Agency (USEPA) for industrial land use (61,000 mg/kg for both iron and zinc). Therefore, the contaminants detected in surface soil are not a concern regarding their persistence to exist in the environment.

5.1.3 Waste and Subsurface Soil

Elevated levels of SVOCs and metals were detected in waste at the landfill and to a lesser degree in the subsurface soil. The contaminants and concentrations detected in the waste at the Sonia Road landfill are typical of municipal solid waste. SVOCs and metals are relatively immobile in the environment. SVOCs have low volatility, low aqueous solubility, and high octanol water and organic carbon partition coefficients. Metals detected at the site are not volatile at low/ambient temperatures and have moderate solubility. Based on these characteristics, in addition to low degradation potential, both SVOCs and metals are persistent in the environment, and are expected to remain at the Sonia Road Landfill. However, while persistent, based on the results of the toxicity characteristic leaching procedure (TCLP) analyses and the groundwater results obtained from this investigation, the elevated levels of SVOCs and metals detected in the waste and subsurface soil, except for iron, manganese and sodium, do not appear to be leaching substantially and migrating into groundwater. In addition, these contaminants are not volatilizing to the atmosphere. This lack of migration is likely the result of biological and chemical reactions within the waste mass.

5.1.4 Groundwater

The contaminants of concern for groundwater include volatile organic compounds (VOCs) and leachate parameters, including ammonia, iron, manganese, sodium and phenols.

VOCs have a relatively high solubility as compared to other organic compounds, such as SVOCs, pesticides and PCBs and, therefore, are more likely to be released from waste and contaminated soil and detected in groundwater. The primary VOCs detected in the study area comprise chlorinated hydrocarbons. These compounds have been detected downgradient and upgradient of the landfill in this remedial investigation, as well as in previous investigations conducted for the site and in the study area, and are not likely emanating from the landfill.

Since the chlorinated hydrocarbons detected are dissolved in groundwater, they will likely persist in the environment as a family of compounds for an extended period of time. These VOCs, although not having a high degradation potential, will undergo some transformation in the groundwater and create breakdown products. Therefore, as previously discussed, although the original/parent compounds may not persist in groundwater, breakdown products of these compounds, a number of which are more toxic than the parent compound, will continue to persist in the environment. However, these contaminants, as they migrate in groundwater, will lessen in concentration as a result of dilution and dispersion. This is evidenced by the lower levels of VOCs detected downgradient of the landfill as compared to the immediate vicinity of the landfill.

As water percolates through the waste, the landfill will continue to generate leachate. Although the Presumptive Remedy selected for the Sonia Road Landfill (capping with a low permeability geomembrane) will mitigate the generation of leachate in the unsaturated zone, the waste below the water table will continue to release contaminants to groundwater. While there will be continued releases, it is expected that the levels will be substantially reduced in the future, due both to the cap and reduction in contaminants in waste below the water table. In fact, comparison of leachate parameters in groundwater immediately downgradient of the landfill to concentrations detected in groundwater farther downgradient indicates that natural attenuation of contamination is occurring at the landfill site, which is not unexpected, since the landfill last received waste in 1974, nearly 25 years ago.

The iron, manganese and sodium detected in the groundwater will not degrade in the environment, but will lessen in concentration as it migrates away from the landfill as a result of

dilution and dispersion. Ammonia may convert to nitrate in groundwater and, therefore, will persist as a nitrogen compound, but will also lessen in concentration as a result of dispersion and dilution as it migrates away from the landfill.

5.2 Contaminant Migration

Contaminant transport addresses the mobility of contaminants and their ability to migrate in the environment. Similar to persistence, the mobility of a contaminant in the environment is based on the physical and chemical properties of the contaminant and the matrix in which it has been detected and expected to migrate through.

5.2.1 Soil Vapor/Explosive Gas

Elevated levels of methane gas were detected in soil vapor in the landfill and two perimeter wells located in the northeast and southeast portions of the landfill. Therefore, there is the potential for off-site migration of methane to adjacent industrial and residential properties after construction of the cap. Methane migration through the waste material, in large part, is based on preferential pathways and will be impacted by the permeability of overlying material and adjacent soils, as well as weather conditions, including frozen surface conditions and barometric pressure. Methane gas will not be adsorbed by the soil and will not migrate into groundwater. In addition, the moderate to high permeability of the soil adjacent to the landfill will allow off-site migration of methane through the unsaturated zone.

5.2.2 Surface Soil

As discussed in Section 5.1.2, the contaminants detected in the surface soil, SVOCs and metals, are relatively immobile in the environment due to their low solubility and vapor pressures, and high octanol water and organic carbon partition coefficients for the semivolatile organic compounds. Therefore, except for possible migration with soil as a result of surface runoff, these contaminants will not readily migrate from surface soil.

5.2.3 Waste and Subsurface Soil

As discussed in Section 5.1.2, the contaminants detected in the waste and soil at the site appear to be substantially contained in the waste and soil and, except for a few leachate parameters (ammonia, iron, manganese, sodium and phenols), do not appear to be migrating in significant concentrations to groundwater.

5.2.4 Groundwater

The migration of contaminants in groundwater is largely controlled by the direction of groundwater flow and the contaminant specific gravity, as well as the geologic characteristics of the formation in which the groundwater is flowing. Horizontal groundwater flow has been defined for the shallow, intermediate and deep zones in the stratigraphic unit of concern (Upper Glacial aquifer) as in the southeasterly direction. Contaminants detected in groundwater in the vicinity of the landfill will therefore migrate in a southeasterly direction downgradient of the landfill.

With regard to vertical groundwater flow, except for a few of the well locations immediately adjacent to the landfill, the Sonia Road Landfill study area is located in a zone of groundwater discharge (upward flow). The landfill appears to have a slight mounding effect on the water table in the immediate vicinity of the landfill. Therefore, based on the vertical gradients, significant downward migration of contaminants at the landfill site is unlikely. This is substantiated by the chemical results of groundwater samples, which indicate that impacts caused by the landfill are limited to the upper portion of the Upper Glacial aquifer in the immediate vicinity of the landfill. However, many of the contaminants of concern have specific gravities greater than water. In the absence of strong upward vertical gradients, which is characteristic of the area of the Sonia Road Landfill, the contaminants will migrate downward as they travel downgradient from the landfill. This too is evidenced by the groundwater results which show

elevated concentrations of leachate parameters at depth approximately 1,000 feet downgradient of the landfill.

The Gardiners Clay, which was found in the study area, acts as a low permeability barrier to the vertical migration of the contaminants to the underlying Magothy aquifer. Therefore, vertical migration of contaminants from the landfill into the Magothy aquifer, which is the primary source of public water supply in the study area, is mitigated by the presence of the clay unit in the vicinity and downgradient of the site.

Section 6

6.0 CONCLUSIONS

The conclusions presented in this section are based on previously collected data and information, together with chemical results, and physical and environmental information obtained during the remedial investigation conducted for the Sonia Road Landfill. The conclusions are formulated as a result of the determination of the nature and sources of contamination, contaminant persistence and potential for migration, as well as comparison of the chemical results to standards, criteria and guidelines selected for the site. The conclusions provided below are presented as a function of the media investigated at the site and in the study area.

6.1 Soil Vapor/Explosive Gas

Soil vapor screening for total organic vapors and the analytical results of soil vapor samples did not indicate elevated levels of volatile organic compounds. Therefore, the release of VOCs from the landfill into ambient air is not a concern at the Sonia Road Landfill. However, based on methane measurements obtained during this investigation and previous monitoring results, the potential for off-site migration of methane gas exists and the potential is expected to become greater after implementation of the selected Presumptive Remedy (capping) for the landfill. As a result, soil vapor/methane gas is a medium of concern.

6.2 Surface Soil

The concentrations of contaminants detected in surface soil, exclusive of iron and zinc found in a limited area of stressed vegetation in the central portion of the landfill, are not significant and are consistent with background levels. Although the surface soil in the area of stressed vegetation could possibly be considered a medium of concern if there was frequent and long-term exposure to this soil, the Presumptive Remedy selected for the site will mitigate potential migration of and contact with this soil. Therefore, surface soil is not a medium of concern relative to past, present and planned use of the site.

6.3 Waste and Subsurface Soil

Elevated concentrations of contaminants, typical of municipal solid waste, were detected in samples collected from waste buried in the landfill. However, significant levels of VOCs were not detected in the waste samples, and only low levels of contaminants were detected in soil immediately below the waste material. Although waste could be considered a medium of concern, the landfill is currently provided with a soil cover. In addition, the landfill is planned to be capped, which will further reduce concern relative to potential direct contact with the waste material and will mitigate leaching of contaminants to groundwater.

6.4 Groundwater

Samples of shallow groundwater collected immediately downgradient of the landfill indicated the presence of elevated concentrations of leachate parameters; however, no VOCs were detected, except for low levels of chloroethane (less than 10 ug/l). The presence of leachate parameters extends downgradient from the landfill and into deeper groundwater in the Upper Glacial aquifer. However, it appears that leachate impacts on groundwater are being naturally attenuated at the landfill site based on the finding of lower levels of leachate parameters in groundwater immediately contiguous to the site as compared to downgradient. This attenuation is likely attributable to the aging of waste material in the landfill which last received waste nearly 25 years ago.

Although the presence of leachate parameters in groundwater could be considered a medium of concern, since this groundwater is not expected to impact human health as a result of 1) all properties being supplied with public water within approximately 1.5 miles downgradient of the landfill; 2) the landfill site and downgradient areas being underlain by the Gardiners Clay; 3) the distance of the closest public water supply wells being over 2 miles downgradient of the landfill; and 4) the depth of the public water supply wells being greater than 400 feet, there is little concern for this medium. In addition, implementation of the selected Presumptive Remedy

(capping) for the Sonia Road Landfill will significantly mitigate the generation of leachate in the future and further lessen this concern.

With regard to volatile organic chemical contamination of groundwater in the vicinity of the Sonia Road Landfill, significant levels of VOCs were detected upgradient and downgradient of the landfill. There are a number of potential sources of VOC contamination upgradient of the Sonia Road Landfill, in particular the Baron Blakeslee site which is a documented significant source of the same contaminants detected in groundwater at the landfill. A plume of highly contaminated groundwater has previously been determined as migrating from the Baron Blakeslee site and potentially beneath the northeast corner of the landfill where the highest VOC concentrations were detected during this investigation. Based on documented sources of contamination upgradient of the landfill, the finding of significant VOC contamination only in the deep wells at the landfill site, including the upgradient perimeter wells, and the lack of correlation of leachate parameters with the VOCs detected in the deep wells, it is unlikely that the Sonia Road Landfill is the cause of volatile organic chemical contamination. Therefore, although deep VOC-contaminated groundwater is a medium of concern in the study area, since it does not appear to be related to the landfill, it is not a medium of concern relative to the Sonia Road Landfill.

7.0 RECOMMENDATIONS

The recommendations provided below are based on the conclusions presented in Section 6.0, including a preliminary assessment of potential impacts on human health and the environment based on a comparison of the investigation results to the standards, criteria and guidelines selected for the Sonia Road Landfill. These recommendations may be modified based on the results of the Baseline Risk Assessment.

- Implement the selected Presumptive Remedy which will provide for a low permeability cap over the landfill. The cap will mitigate the generation of landfill leachate and impacts on groundwater. In addition, the cap will also provide closure of the waste mass and underlying soils;

- As a result of the landfill capping, provide for landfill perimeter gas control to prevent off-site subsurface migration of methane;

- Since the Presumptive Remedy will mitigate future impacts to groundwater resulting from leachate generation, remediation of groundwater, relative to the Sonia Road Landfill, is not recommended;

- Provide for long-term landfill gas and groundwater monitoring to monitor the effectiveness of the Presumptive Remedy and landfill gas control; and

- Relative to groundwater contaminated by volatile organic compounds in the Sonia Road Landfill study area, New York State Department of Environmental Conservation will be performing additional investigations upgradient of the landfill to determine potential responsible parties relative to groundwater contamination.

Section 8

8.0 REFERENCES

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