

HUNTINGTON LF

SITE NO. 152040

TOWN OF HUNTINGTON, SUFFOLK CO.

**Groundwater and Surface Water
Sampling & Analysis
East Northport Landfill
East Northport, New York
April, 2003**

Prepared for:

**Town of Huntington Department of Environmental Waste Management
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Section HA-1A

Tabulated comparison of historical analytical results in order as follows: CW1-S, CW1-M, CW2-M, CW4-S, CW4-M, EN1-M, EN6-S, EN6-M, EN7-M, EN9-M, EN10-M, SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, SW-7

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Appendix

Appendix 1. *Laboratory Analytical Data*

**Groundwater and Surface Water Sampling & Analysis
East Northport Landfill
East Northport, New York
April, 2003**

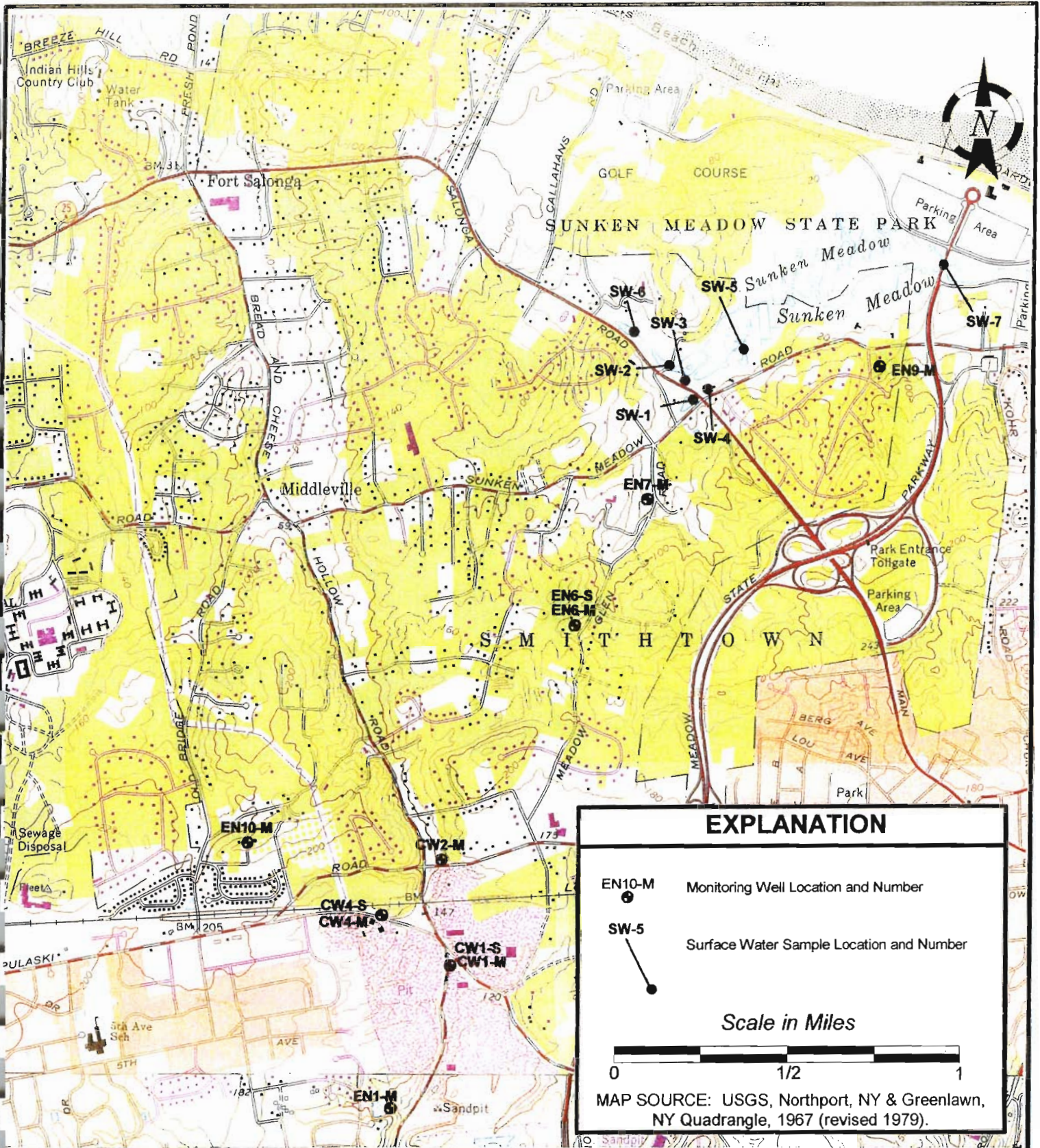
Introduction

Presented herein are the results of April, 2003, groundwater and surface water sampling and analyses performed as stipulated by the Record of Decision for the East Northport Landfill Remedial Investigation/Feasibility Study. The aforementioned Record of Decision requires "semi-annual sampling and analysis of eleven groundwater monitoring wells and seven surface water locations for leachate parameters." Figure 1 illustrates the location of groundwater and surface water sampling points. The scope-of-work completed (per our agreement with the Town of Huntington Department of Environmental Waste Management dated February 5, 2001) is presented below. A description of sampling methodology, quality assurance/quality control procedures, and a summary of analytical results follows.

Scope of Work

The scope-of-work includes performance of the following items:

- 1) sampling of groundwater monitoring wells CW1-S, CW1-M, CW2-M, CW4-S, CW4-M, EN1-M, EN6-S, EN6-M, EN7-M, EN9-M, EN10-M and surface water locations SW-1 through SW-7;
- 2) analyzing collected groundwater samples for *Volatile Organic Compounds* by EPA method 624 with TCL parameter list and ASP category B reporting of data; *Metals* (Aluminum, Arsenic, Chromium, Cadmium, Calcium, Iron, Lead, Magnesium, Mercury, Potassium, Sodium); and *Leachate Indicators* (Alkalinity/Bicarbonate, Ammonia, Nitrate, Chloride, TDS, Hardness, Sulfate);
- 3) analyzing collected surface water samples for *Volatile Organic Compounds* and *Leachate Indicators* (as above); and
- 4) measuring and recording appropriate field data including Temperature, pH, Specific Conductivity, Dissolved Oxygen, Salinity and Turbidity.



EXPLANATION

EN10-M Monitoring Well Location and Number

SW-5 Surface Water Sample Location and Number

Scale in Miles

0 1/2 1

MAP SOURCE: USGS, Northport, NY & Greenlawn, NY Quadrangle, 1967 (revised 1979).

Groundwater and Surface Water Sampling Locations

East Northport Landfill Post Closure Water Sampling	Prepared By: RDH	Date: May 1997
	Reviewed By: RNC	Figure: 1

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Sampling Methodology

Groundwater sampling methodology includes purging a minimum of 3-5 casing volumes of water from each monitoring well - via a submersible centrifugal pump (Grundfos Redi-Flo2) with per-well dedicated tubing - prior to sample collection. During well purging activities, dissolved oxygen, specific conductivity, temperature, pH, salinity and turbidity are measured and recorded on a per-casing-volume basis. Groundwater samples are collected following the stabilization of these values to within 10 %. The Grundfos Redi-Flo2 is cleaned internally and externally with an Alconox and water solution, followed by two fresh water rinses, between each sampling location.

Surface water sampling methodology includes immersing laboratory supplied containers at each sample location and allowing water to flow smoothly into them. In addition, surface water samples are collected during a dry period (minimum of 3 days sans precipitation prior to sampling) to minimize the influence of surface water runoff from adjacent land surfaces and roadways. Consequently, collected surface water samples reflect stream base-flow and, for the most part, the quality of groundwater.

Groundwater samples from monitoring wells CW1-S, CW1-M, CW4-S, CW4-M, EN1-M, EN6-S, EN6-M and EN10-M, as well as surface water samples SW-1 through SW-7, were collected April 15, 2003. Groundwater samples from monitoring wells CW2-M, EN7-M and EN9-M were collected April 16, 2003. Following the completion of sampling activities, collected samples were submitted under chain-of-custody control to New York State Department of Health certified Chemtech for chemical analysis. A copy of the original laboratory "Sample Data Summary Package" is presented in Appendix 1.

A summary of field data measured and recorded at all sampling locations is presented on Table 1. Data associated with groundwater monitoring well sampling points reflects the last value measured during purging activities.

Quality Assurance/Quality Control

A narrative discussion (conformance/nonconformance summary) of QA/QC procedures practiced by Chemtech - which entails instrument calibrations, analysis of method blanks, matrix spike blanks and percent-recovery of surrogates (system monitoring compounds) - is included in the above mentioned "Sample Data Summary Package" presented in Appendix 1. Matrix spike/matrix spike duplicates (MS/MSD's) were collected to support both groundwater and surface water analyses. The MS/MSD samples were collected from monitoring well EN7-M and sampling location SW-3 for groundwater and surface

Table 1
Summary of Field Data
Measured April 15-16, 2003
East Northport Landfill, East Northport, NY

Sampling Point	Dissolved Oxygen (mg/l)	Conductivity (umhos)	Temperature (°centigrade)	pH (units)	Salinity (‰)	Turbidity (ntu)
CW1-S	0.60	1100	24.0	7.91	0.5	2.00
CW1-M	0.50	360	24.0	7.31	0.0	19.00
CW2-M	0.60	150	14.0	6.12	0.0	2.00
CW4-S	0.30	115	16.0	6.56	0.0	48.00
CW4-M	5.90	140	16.5	6.51	0.0	0.65
EN1-M	6.80	190	12.5	6.51	0.0	1.90
EN6-S	6.30	130	13.0	6.29	0.0	8.30
EN6-M	0.30	210	12.0	6.02	0.0	0.15
EN7-M	1.40	310	11.0	6.07	0.0	0.06
EN9-M	1.00	100	11.0	6.71	0.0	10.50
EN10-M	7.70	185	17.0	6.79	0.0	0.00
SW-1	9.40	125	12.0	7.08	0.0	1.60
SW-2	7.30	155	12.5	7.08	0.0	4.40
SW-3	7.30	110	11.0	6.73	0.0	2.80
SW-4	8.90	130	12.0	7.18	0.0	0.95
SW-5	7.10	300	14.5	6.90	0.0	1.50
SW-6	9.00	350	14.5	7.37	0.0	6.60
SW-7	10.40	990	14.0	7.03	0.5	3.10

water QA/QC purposes, respectively. Additionally, trip blanks identified as TB-GW and TB-SW, representative of groundwater and surface water samples, respectively, were analyzed for volatile organic compounds. A field blank (FB4-16), representative of groundwater sampling activities, was also analyzed for volatile organic compounds.

The accuracy of reported analytical results was assessed by analyzing blind duplicates collected for groundwater sampled from monitoring well CW1-M (identified as GW-B) and surface water sampling location SW-2 (identified as SW-B). Blind duplicate samples GW-B and SW-B were analyzed for all groundwater and surface water parameters, respectively.

Summary of Analytical Results

QA/QC Samples

Neither of the aforementioned trip blanks, nor the field blank, exhibited detectable concentrations of targeted analytes (i.e., volatile organic compounds). Analytical results relative to blind duplicate and representative groundwater and surface water samples compare favorably (see Tables 2, 2A, 3 and 3A) - with the exception of the detection of the volatile organic compounds benzene and chlorobenzene in groundwater sample CW1-M. These compounds were not detected in corresponding blind duplicate sample GW-B, thus, their detection in CW1-M is suspect. The aforementioned discrepancy notwithstanding, results of groundwater and surface water analyses summarized below are considered valid.

Groundwater

The results of groundwater analyses and New York State Department of Environmental Conservation (NYSDEC) Class GA drinking water standards for volatile organic compounds and metals/leachate indicators, are summarized on Tables 2 and 2A, respectively.

As shown on Table 2, volatile organic compounds detected in excess of NYSDEC drinking water standards include *vinyl chloride* (EN7-M), *trichloroethene* (EN7-M), *benzene* (CW1-M), *tetrachloroethene* (EN6-M, EN7-M) and *chlorobenzene* (CW1-M). As alluded to previously, the detection of benzene and chlorobenzene in groundwater sample CW1-M is considered suspect.

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As shown on Table 2A, metals detected in excess of NYSDEC drinking water standards include *arsenic* (CW1-M), *iron* (CW1-S, CW1-M, CW4-S), *lead* (CW-4S) and *sodium* (CW1-S, CW1-M, CW2-M, EN6-S, EN6-M, EN7-M). The sole leachate indicator detected in excess of NYSDEC's drinking water standard is *Chloride* (EN7-M).

Surface Water

Tables 3 and 3A summarize analytical results and NYSDEC Class GA drinking water standards for volatile organic compounds and leachate indicators, respectively.

As shown on Table 3, volatile organic compounds were not detected above NYSDEC Class GA drinking water standards in any of the collected surface water samples. *Tetrachloroethene*, in surface water samples SW-1 through SW-4, is the sole volatile organic compound detected.

As shown on Table 3A, the leachate indicator *chloride* was detected in excess of NYSDEC's drinking water standard in surface water sample SW-7. As noted in previous reports, the detection of an elevated concentration of chloride at this sampling point is attributable to the influence of saline surface water (sampling point SW-7 is within the tidal portion of Sunken Meadow Creek).

Historical Analysis

Section HA-1A presents a detailed tabulated comparison of historical analytical results. A summary of inconsistencies with the most recent analyses, completed September, 2002, is presented below. With the exception of the below-listed inconsistencies, April, 2003 analytical results, as summarized above, continue to be consistent with past events (i.e., June, 1996, April & September, 1997, April & September, 1998, April & September, 1999, April & September, 2000, April & September, 2001, April & September, 2002).

Groundwater

* The concentration of *vinyl chloride* increased in groundwater sampled from monitoring well EN7-M from non-detect to 5.4 µg/l, a concentration above NYSDEC's drinking water standard of 2.0 µg/l.

* The concentration of *benzene* decreased in groundwater sampled from monitoring well CW1-S from 2.2 µg/l, a concentration above NYSDEC's drinking water standard of 1.0 µg/l, to non-detect.

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- * The concentration of *chlorobenzene* decreased in groundwater sampled from monitoring well CW1-S from 7.0 µg/l, a concentration above NYSDEC's drinking water standard of 5.0 µg/l, to non-detect.
- * The concentration of *arsenic* decreased in groundwater sampled from monitoring well CW1-S from 75.4 µg/l, a concentration above NYSDEC's drinking water standard of 25.0 µg/l, to non-detect.
- * The concentration of *iron* decreased in groundwater sampled from monitoring well EN6-S from 468.0 µg/l, a concentration above NYSDEC's drinking water standard of 300 µg/l, to 249.0 µg/l.
- * The concentration of *lead* increased in groundwater sampled from monitoring well CW4-S from 10.6 to 35.1 µg/l, a concentration above NYSDEC's drinking water standard of 25.0 µg/l.
- * The concentration of *ammonia* decreased in groundwater sampled from monitoring well CW1-S from 160 milligrams per liter (mg/l), a concentration above NYSDEC's drinking water standard of 2.0 mg/l, to non-detect. The concentration of ammonia also decreased in groundwater sampled from monitoring well CW-1M from 61.0 mg/l to 0.5 mg/l

Surface Water

- * The concentration of *sulfate* decreased at sampling point SW-7 from 310.0 mg/l, a concentration above NYSDEC's drinking water standard of 250 mg/l, to 180.0 mg/l.

Table 2 continued

Contaminant	CW1-S	CW1-M	CW2-M	CW4-S	CW4-M	EN1-M	EN6-S	EN6-M	EN7-M	EN9-M	EN10-M	GW-B	TB-GW	FB4-16	NYSDEC Class GA Standard
Ethylbenzene	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	5.0
1,2-Dichlorobenzene	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	3.0
1,3-Dichlorobenzene	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	3.0
1,4-Dichlorobenzene	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	3.0

Note:

ND(): Compound not detected at the method detection limit

NYSDEC Class GA Standards: New York State Department of Environmental Conservation Ambient Water Quality Standards for Source of Drinking Water Title 6 Part 703 (per June 1998 revision)

GV: NYSDEC Guidance Value for Source of Drinking Water

NS/GV: No NYSDEC Standard or Guidance Value Established

J: Indicates an estimated value; compound is present at a concentration less than specified detection limit

*Standard of 0.4 applies to sum of cis and trans 1,3-Dichloropropene

Table 2A

**Summary of Analytical Results-Groundwater
East Northport Landfill, East Northport, NY
Sampled April 15-16, 2003
Metals and Leachate Indicators**

Reported in Micrograms per Liter (µg/l) and Milligrams per Liter (mg/l)

	CW1-S	CW1-M	CW2-M	CW4-S	CW4-M	EN1-M	EN6-S	EN6-M	EN7-M	EN9-M	EN10-M	GW-B	NYSDEC Class GA Standard
Metals (µg/l)													
Aluminum	ND(78.9)	ND(78.9)	ND(78.9)	319.0	ND(78.9)	ND(78.9)	ND(78.9)	ND(78.9)	ND(78.9)	ND(78.9)	ND(78.9)	ND(78.9)	NS/GV
Arsenic	ND(11.9)	75.1	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	ND(11.9)	25.0
Cadmium	ND(1.0)	ND(1.0)	ND(1.0)	1.2 B	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	5.0
Calcium	11,700.0	19,700.0	25,000.0	10,000.0	22,900.0	23,600.0	14,500.0	79,300.0	83,700.0	14,600.0	21,100.0	11,300.0	NS/GV
Chromium	ND(1.0)	4.4 B	ND(1.0)	7.6 B	1.8 B	1.7 B	22.8	ND(1.0)	ND(1.0)	ND(1.0)	3.1 B	1.2 B	50.0
Iron	721.0	6,640.0	227.0	2,540.0	72.9 B	67.8 B	249.0	27.9 B	ND(2.2)	34.7 B	38.8 B	1,100.0	300.0
Lead	ND(3.0)	3.8	4.0	35.1	ND(3.0)	ND(3.0)	ND(3.0)	4.2	3.0	ND(3.0)	ND(3.0)	ND(3.0)	25.0
Magnesium	6,740.0	24,400.0	8,330.0	2,230.0 B	9,350.0	9,810.0	7,290.0	20,700.0	37,000.0	7,100.0	8,450.0	6,480.0	35,000.0 GV
Mercury	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	0.7
Potassium	24,100.0	124,773.4	7,670.0	5,770.0	1,390.0 B	1,530.0 B	1,870.0 B	4,040.0 B	4,490.0 B	1,330.0 B	1,390.0 B	24,200.0	NS/GV
Sodium	56,400.0	254,000.0	23,500.0	5,980.0	12,500.0	17,100.0	34,300.0	61,800.0	234,000.0	15,200.0	15,400.0	56,900.0	20,000.0
Leachate Indicators (mg/l)													
Ammonia	ND(0.2)	0.5	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	2.0
Bicarbonate	820.0	120.0	55.0	79.0	81.0	77.0	14.0	150.0	300.0	34.0	20.0	130.0	NS/GV
Chloride	53.0	170.0	37.0	8.4	22.0	31.0	49.0	130.0	280.0	39.0	26.0	58.0	250.0
Nitrate	ND(0.5)	2.4	0.9	0.5	6.8	9.2	7.4	3.5	0.6	0.5	7.5	2.4	10.0
Sulfate	28.0	19.0	69.0	7.7	32.0	38.0	28.0	150.0	280.0	19.0	190.0	29.0	250.0
Alkalinity	830.0	120.0	55.0	78.0	82.0	77.0	14.0	150.0	300.0	34.0	20.0	130.0	NS/GV
TDS	1,025.0	274.0	222.0	87.0	195.0	223.0	196.0	566.0	1,050.0	165.0	196.0	277.0	NS/GV
Hardness	57.0	150.0	97.0	34.0	96.0	99.0	66.0	280.0	360.0	66.0	87.0	55.0	NS/GV

Note:

ND(): Compound not detected at the method detection limit

NYSDEC Class GA Standards: New York State Department of Environmental Conservation Ambient Water Quality Standards for Source of Drinking Water Title 6 Part 703 (per June 1998 revision)

GV: NYSDEC Guidance Value for Source of Drinking Water

NS/GV: No NYSDEC Standard or Guidance Value Established

B: Reported value less than contract required detection limit but greater than or equal to instrument detection limit

Table 3 continued

Contaminant	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-B	TB-SW	NYSDEC Class GA Standard
Ethylbenzene	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	ND(1.2)	5.0
1,2-Dichlorobenzene	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	ND(1.6)	3.0
1,3-Dichlorobenzene	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	ND(0.8)	3.0
1,4-Dichlorobenzene	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	3.0

Note:

ND(): Compound not detected at the method detection limit

NYSDEC Class GA Standards: New York State Department of Environmental Conservation Ambient Water Quality Standards for Source of Drinking Water Title 6 Part 703 (per June 1998 revision)

GV: NYSDEC Class GA Guidance Value for Source of Drinking Water

NS/GV: No NYSDEC Standard or Guidance Value Established

*Standard of 0.4 applies to sum of cis and trans 1,3-Dichloropropene

J: Indicates an estimated value; compound is present at a concentration less than specified detection limit

Table 3A

**Summary of Analytical Results-Surface Water
East Northport Landfill, East Northport, NY
Sampled April 15, 2003
Leachate Indicators
Reported in Milligrams per Liter**

Parameter	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-B	NYSDEC Class GA Standard
Ammonia	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	2.0
Bicarbonate	26.0	44.0	24.0	32.0	51.0	34.0	44.0	44.0	NS/GV
Chloride	58.0	80.0	57.0	66.0	81.0	520.0	1,100.0	80.0	250.0
Nitrate	3.3	1.1	ND(0.5)	2.1	3.1	ND(0.5)	0.80	1.2	10.0
Sulfate	22.0	30.0	20.0	21.0	36.0	26.0	180.0	29.0	250.0
Alkalinity	26.0	44.0	24.0	32.0	50.0	34.0	44.0	44.0	NS/GV
TDS	175.0	246.0	188.0	186.0	271.0	903.0	2,108.0	237.0	NS/GV
Hardness	61.0	83.0	67.0	63.0	100.0	76.0	320.0	82.0	NS/GV

Note:
 ND(): Compound not detected at the method detection limit
 NYSDEC Class GA Standards: New York State Department of Environmental Conservation Ambient Water Quality Standards for Source of Drinking Water Title 6 Part 703 (per June 1998 revision)
 NS/GV: No NYSDEC Standard or Guidance Value Established