STERLING
Sterling Environmental Engineering, P.C.

April 4, 2012

Mr. Carl Hoffman, P.E.
Environmental Engineer II
NYSDEC
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7013

Subject: Town of Ramapo Landfill
2012 1st Quarter Analytical Results for Downgradient Drinking Water Supply Wells
STERLING File #20010 (Task 404)

Dear Mr. Hoffman,

This report provides water quality analytical results for samples collected from sentinel monitoring wells and drinking water supply wells located downgradient from the Town of Ramapo Landfill (Landfill), Rockland County, New York. The samples were collected by Sterling Environmental Engineering, P.C. (STERLING) in response to a recommendation by the United States Environmental Protection Agency (USEPA) in the December 2009 5-Year Report for the Ramapo Landfill that drinking water supply wells be sampled on a quarterly basis. In addition, three (3) downgradient sentinel monitoring wells were sampled.

Groundwater samples were collected on March 14, 2012 by STERLING from sentinel monitoring wells 9-OS, 9-I and 9-R, private water supply wells PW-1 and PW-2, and municipal water supply wells SVWC-93, SVWC-94 and SVWC-96 (United Water wells). United Water well SVWC-95 is currently out of service and no sample was collected for this event. Sample locations are shown on Figure 1.

Results for the 2012 1st quarter sampling event are summarized below.

GROUNDWATER MONITORING

Water Level (for monitoring wells only), Specific Conductivity, Temperature and Oxidation Reduction Potential (ORP) were measured in the field and are presented on Table 1, "Field Parameter Measurements". The pH unit could not be calibrated accurately, therefore pH measurements were not obtained for this event. All samples were analyzed for Total Kjeldhal Nitrogen (TKN), Chemical Oxygen Demand (COD), Alkalinity, Hardness, Total Analyte List Metals (TAL Metals) and full Volatile Organic Compounds (VOCs) analysis by USEPA Method 624. Samples were analyzed by TestAmerica Laboratories, Inc., located in Amherst, New York, an ELAP certified laboratory. Sample analysis follows USEPA methodologies and protocols and New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) Category A reporting requirements. Copies of the laboratory reports are attached.

The 2012 1st Quarter analytical results are summarized on Tables 2 and 3, "Quarterly Groundwater Quality Analytical Results." A duplicate sample was collected from United Water well SVWC-93 and labeled DUPLICATE.

The reported parameter concentrations for monitoring wells 9-OS, 9-I and 9-R are compared with the NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1, Ambient Water Quality Standards and Guidance Values (June 2004) (TOGS 1.1.1) and the USEPA National Primary Drinking Water Maximum Contaminant Levels (USEPA MCLs). The reported concentrations for drinking water supply wells PW-1, PW-2, SVWC-93, SVWC-94 and SVWC-96 are compared with the 10 NYCRR Part 5, Subpart 5-1 maximum contaminant levels (Part 5 MCLs) and the USEPA MCLs:

Well 9-OS:

Reported concentrations for Chromium and Iron exceed the applicable TOGS 1.1.1 groundwater standards. Chromium also exceeds the USEPA MCL. No detected VOCs are reported for this sample.

Well 9-I:

No detected VOCs are reported for this sample. All other analytes are below applicable water quality standards and/or guidance values.

Well 9-R:

Reported concentrations for Iron, Manganese and Sodium exceed the applicable TOGS 1.1.1 groundwater standards. No detected VOCs are reported for this sample.

Well PW-1:

Lead is reported at 0.027 mg/L which exceeds the USEPA MCL of 0.015 mg/L. This is the first time Lead is reported above the USEPA MCL since 1999.

No detected VOCs are reported for this sample. While there is no USEPA or Part 5 MCL for Sodium, the reported Sodium levels for this well should be considered with regard to guidelines provided in Part 5 for people following severely restricted Sodium diets.

Well PW-2:

Parameters reported at detectable concentrations do not exceed the USEPA or Part 5 MCLs. No detected VOCs are reported for this sample.

Wells SVWC-93, SVWC-94, SVWC-96:

Parameters reported at detectable concentrations for the United Water wells do not exceed the USEPA or Part 5 MCLs. While there is no USEPA or Part 5 MCL for Sodium, the reported Sodium

levels for these wells should be considered with regard to guidelines provided in Part 5 for people following severely restricted Sodium diets. No detected VOCs are reported for these wells.

Conclusions:

The reported Sodium concentrations for the United Water wells and PW-1 should be reviewed by the County Health Department with regards to recommendations made in Part 5 for people on severely restricted Sodium diets.

Please contact me should you have any questions or comments.

Very truly yours,

STERLING ENVIRONMENTAL ENGINEERING, P.C.

Elizabeth M. Davis

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EMD/bc
Email Only (NYSDEC)
Attachments (Figure 1, Tables 1 through 3, Laboratory Reports)

cc: George Jacob, USEPA Region 2
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Judy Hunderfund, Rockland County DOH
Cathy Quinn, Rockland County DOH
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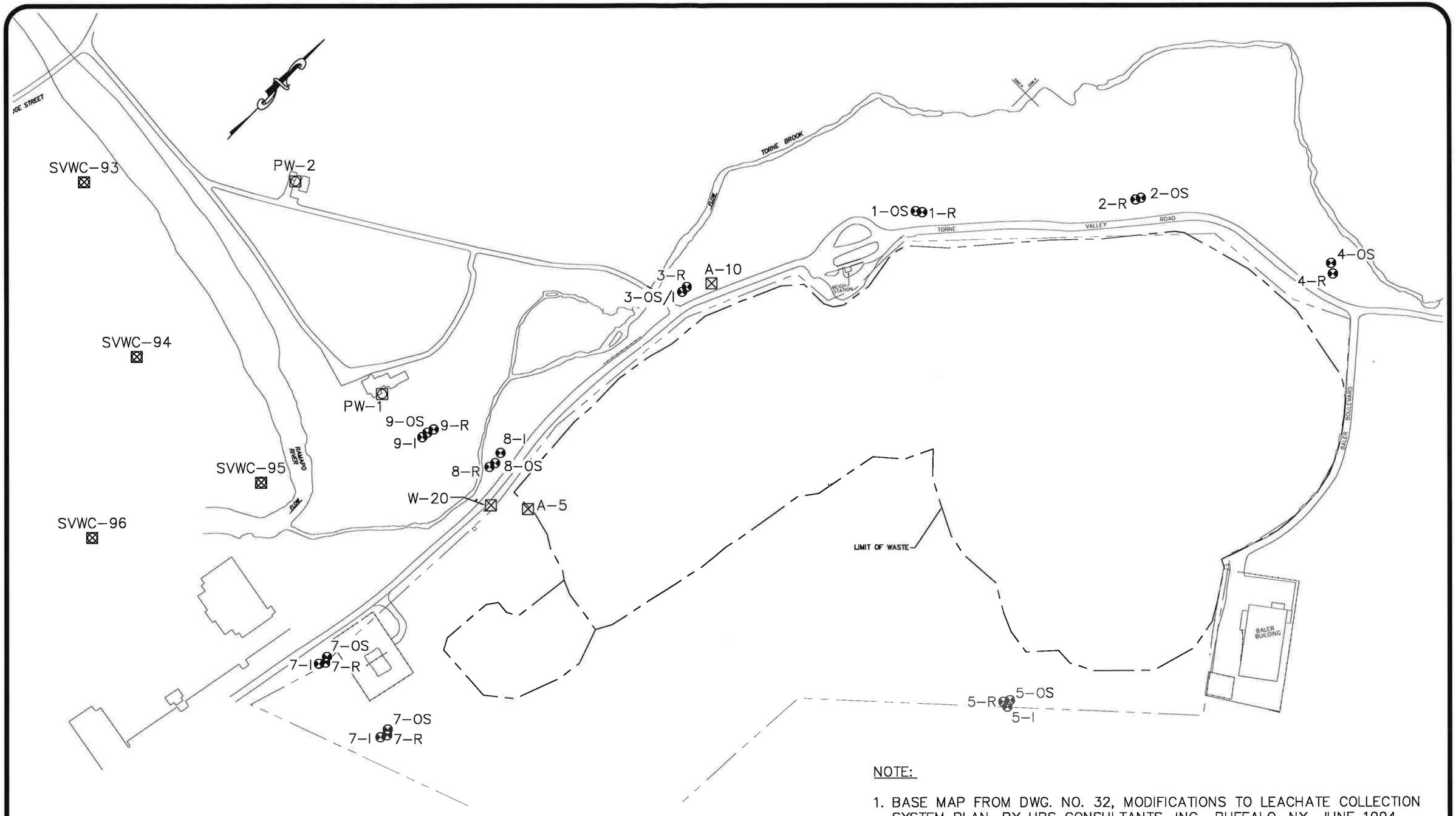
Rosie Digianni, 20 Torne Brook Road
Arlene Lapidos, Ramapo Land Co., Inc.
Ted Dzurinko, Town of Ramapo
Ed Moran, Town of Ramapo



NOTE:

1. BASE MAP FROM DWG. NO. 32, MODIFICATIONS TO LEACHATE COLLECTION SYSTEM PLAN, BY URS CONSULTANTS, INC., BUFFALO, NY, JUNE 1994.

LEGEND:

5-OS	MONITORING WELL
PW-1	EXISTING PRIVATE WELL
SVWC-93	EXISTING UNITED WATER NEW YORK WELL
A-10	ON-SITE RECEPTOR STRUCTURE

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GROUNDWATER MONITORING LOCATIONS
TOWN OF RAMAPO
LANDFILL
TOWN OF RAMAPO ROCKLAND CO., N.Y.

PROJ. No.:	DATE:	SCALE:	DWG. NO.	FIGURE
20010	10-3-11	N.T.S.	20010021	1

TABLE 1
POST-CLOSURE WATER QUALITY MONITORING
TOWN OF RAMAPO LANDFILL
FIELD PARAMETER MEASUREMENTS FOR 3/14/12

Parameter[1]	Units	9-OS	9-I	9-R	PW-1	PW-2	SVWC-93	SVWC-94	SVWC-96
Static Water Level[2]	feet	9.37	10.98	11.41	---	---	---	---	---
Specific Conductivity	mS/cm[c]	0.117	0.093	0.695	0.381	0.226	0.347	0.328	0.350
Temperature	degrees C	13.42	14.89	13.38	14.86	13.83	9.24	9.40	11.12
ORP	mV	253.3	246.1	-1.4	222.9	226.8	280.1	272.2	268.1

NOTES :

[1]pH measurements were not obtained for this event because the unit could not be calibrated accurately.

[2]Measured from the top of the PVC well casing to water surface.

Table 2
Quarterly Groundwater Quality Analytical Results
For Drinking Water Supply Wells
Town of Ramapo Landfill
3/14/2012

Analyte	CAS Number	Units	Specific Method	Reports To	Basis	Reg 1	Reg 2	PW-1	PW-2	SVWC-93	DUP	SVWC-94	SVWC-96	TRIP BLANK
1,1,1-Trichloroethane	71-55-6	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	200	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	---	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	79-00-5	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	---	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	75-35-4	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	7	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	95-50-1	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	600	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	107-06-2	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene, Total	540-59-0	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	78-87-5	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	541-73-1	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	---	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	106-46-7	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	75	ND	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	110-75-8	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Acrolein	107-02-8	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	107-13-1	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Alkalinity, Bicarbonate	N/A	mg/L	Alkalinity	MRL	Total	---	---	35.5	62	37.4	36.6	41.6	51.6	---
Alkalinity, Carbonate	N/A	mg/L	Alkalinity	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	---
Alkalinity, Total	N/A	mg/L	Alkalinity	MRL	Total	---	---	35.5	62	37.4	36.6	41.6	51.6	---
Aluminum	7429-90-5	mg/L	Metals (ICP)	MDL	Total	---	---	ND	0.090 J	0.079 J	ND	0.21	0.32	---
Antimony	7440-36-0	ug/L	Metals (ICP/MS)	MRL	Total	6	6	0.15 J	ND	ND	0.23 J	0.80 J	0.35 J	---
Arsenic	7440-38-2	mg/L	Metals (ICP)	MDL	Total	0.01	0.01	ND	ND	ND	ND	ND	ND	---
Barium	7440-39-3	mg/L	Metals (ICP)	MRL	Total	2	2	0.015	0.0023	0.0059	0.0059	0.0089	0.0071	---
Benzene	71-43-2	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
Beryllium	7440-41-7	mg/L	Metals (ICP)	MDL	Total	0.004	0.004	ND	ND	ND	ND	ND	ND	---
Bromoform	75-25-2	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Bromomethane	74-83-9	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Cadmium	7440-43-9	mg/L	Metals (ICP)	MDL	Total	0.005	0.005	ND	ND	ND	ND	ND	ND	---
Calcium	7440-70-2	mg/L	Metals (ICP)	MRL	Total	---	---	11.2 B7	31.3 B7	17.2 B7	17.2 B7	17.6 B7	16.9 B7	---
Carbon tetrachloride	56-23-5	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
Chemical Oxygen Demand	N/A	mg/L	COD	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	---
Chlorobenzene	108-90-7	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	100	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	124-48-1	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Chloroethane	75-00-3	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5		ND	ND	ND	ND	ND	ND	ND
Chloroform	67-66-3	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---		ND	ND	ND	ND	ND	ND	ND
Chloromethane	74-87-3	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5		ND	ND	ND	ND	ND	ND	ND
Chromium	7440-47-3	mg/L	Metals (ICP)	MDL	Total	0.1	0.1	ND	ND	ND	ND	ND	ND	---
cis-1,3-Dichloropropene	10061-01-5	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	---	ND	ND	ND	ND	ND	ND	ND
Cobalt	7440-48-4	mg/L	Metals (ICP)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	---
Copper	7440-50-8	mg/L	Metals (ICP)	MRL	Total	---	1.3	0.22	0.033	0.0054 J	0.0055 J	0.0067 J	0.0031 J	---
Dichlorobromomethane	75-27-4	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	700	ND	ND	ND	ND	ND	ND	ND
Hardness as calcium carbonate	N/A	mg/L	Hardness, Total	MRL	Total	---	---	60	120	100	80	80	80	---
Hydroxide Alkalinity	N/A	mg/L	Alkalinity	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	---
Iron	7439-89-6	mg/L	Metals (ICP)	MRL	Total	0.3*	---	0.025 J B	0.064 B	ND	ND	ND	0.020 J B	---
Lead	7439-92-1	mg/L	Metals (ICP)	MRL	Total	---	0.015	**0.027**	ND	ND	ND	ND	ND	---
Magnesium	7439-95-4	mg/L	Metals (ICP)	MRL	Total	---	---	2.8	3.6	4.5	4.5	4.5	4.4	---
Manganese	7439-96-5	mg/L	Metals (ICP)	MRL	Total	0.3*	---	0.0010 J B	0.0012 J B	ND	ND	ND	ND	---
Mercury	7439-97-6	mg/L	Mercury (CVAA)	MDL	Total	0.002	0.002	ND	ND	ND	ND	ND	ND	---
Methylene Chloride	75-09-2	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
Nickel	7440-02-0	mg/L	Metals (ICP)	MRL	Total	---	---	0.0017 J	0.0044 J	ND	ND	ND	ND	---
Potassium	9/7/7440	mg/L	Metals (ICP)	MRL	Total	---	---	1.9 B	1.2 B	1.4 B	1.3 B	1.3 B	1.4 B	---
Selenium	7782-49-2	mg/L	Metals (ICP)	MDL	Total	0.05	0.05	ND	ND	ND	ND	ND	ND	---
Silver	7440-22-4	mg/L	Metals (ICP)	MDL	Total	0.1	---	ND	ND	ND	ND	ND	ND	---
Sodium	7440-23-5	mg/L	Metals (ICP)	MRL	Total	---	---	53.9	8.7	34.1	34.4	34	42.8	---
Tetrachloroethene	127-18-4	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
Thallium	7440-28-0	ug/L	Metals (ICP/MS)	MRL	Total	2	2	0.012 J	ND	ND	0.0081 J	0.015 J	0.0095 J	---
Toluene	108-88-3	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	1000	ND	ND	ND	ND	ND	ND	ND
Total Kjeldahl Nitrogen	N/A	mg/L	Nitrogen, Total Kjeldahl	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	---
trans-1,2-Dichloroethene	156-60-5	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	100	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10061-02-6	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	---	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	79-01-6	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	5	5	ND	ND	ND	ND	ND	ND	ND
Vanadium	7440-62-2	mg/L	Metals (ICP)	MDL	Total	---	---	ND	ND	ND	ND	ND	ND	---
Vinyl chloride	75-01-4	ug/L	Volatile Organic Compounds (GC/MS)	MDL	Total	2	2	ND	ND	ND	ND	ND	ND	ND
Zinc	7440-66-6	mg/L	Metals (ICP)	MRL	Total	5	---	0.16	0.038	0.0043 J	0.0027 J	0.0040 J	0.021	---

Reg 1 NY-DOH_PWS-Pt5-Tbls1-7_MCLs_Oct2007 NY DOH Part 5-SubPart5-1 Public Water Supply Stds.: MCLs Tables 1-7; Eff. 1 October 2007

Reg 2 USEPA - Primary Drinking Water Standards USEPA - Primary Drinking Water Standards

B = Compound was found in the blank and sample.

J = Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

B7 = Target analyte detected in method blank at or above method reporting limit. Concentration found in the sample was 10 times above the concentration found in the blank.

* = If Iron and Manganese are present, the total concentration of both should not exceed 0.5 mg/L.

Duplicate Sample was collected from SVWC-93

Value in **BOLD** indicates reported concentration exceeds one or more of Regulatory Standards or Guidance Value.

Table 3
Quarterly Groundwater Quality Analytical Results
For Sentinel Monitoring Wells
Town of Ramapo Landfill
3/14/2012

Analyte	CAS Number	Units	Specific Method	Reports To	Reg 1	Reg 2	Reg 3	9-I	9-OS	9-R	TRIP BLANK
1,1-Dichloroethane	75-34-3	ug/L	Volatile Organic Compounds (GC/MS)	MDL	5	---	---	ND	ND	ND	ND
Alkalinity, Bicarbonate	N/A	mg/L	Alkalinity	MRL	---	---	---	14.9	20.1	209 B	---
Alkalinity, Carbonate	N/A	mg/L	Alkalinity	MDL	---	---	---	ND	ND	ND	---
Alkalinity, Total	N/A	mg/L	Alkalinity	MRL	---	---	---	14.9	20.1	209 B	---
Aluminum	7429-90-5	mg/L	Metals (ICP)	MRL	---	---	---	0.088 J	1.1	ND	---
Antimony	7440-36-0	ug/L	Metals (ICP/MS)	MRL	3	---	6	0.17 J	0.15 J	ND	---
Arsenic	7440-38-2	mg/L	Metals (ICP)	MDL	0.025	---	0.01	ND	ND	0.0077 J	---
Barium	7440-39-3	mg/L	Metals (ICP)	MRL	1	---	2	0.0047	0.013	0.028	---
Benzene	71-43-2	ug/L	Volatile Organic Compounds (GC/MS)	MDL	1	---	5	ND	ND	ND	ND
Beryllium	7440-41-7	mg/L	Metals (ICP)	MDL	---	0.003	0.004	ND	ND	ND	---
Cadmium	7440-43-9	mg/L	Metals (ICP)	MDL	0.005	---	0.005	ND	ND	ND	---
Calcium	7440-70-2	mg/L	Metals (ICP)	MRL	---	---	---	3.9 B7	6.5 B7	40.7 B7	---
Chemical Oxygen Demand	N/A	mg/L	COD	MDL	---	---	---	ND	ND	ND	---
Chlorobenzene	108-90-7	ug/L	Volatile Organic Compounds (GC/MS)	MDL	5	---	100	ND	ND	ND	ND
Chromium	7440-47-3	mg/L	Metals (ICP)	MRL	0.05	---	0.1	0.018	**0.18**	ND	---
Cobalt	7440-48-4	mg/L	Metals (ICP)	MDL	---	---	---	ND	0.00077 J	0.0028 J	---
Copper	7440-50-8	mg/L	Metals (ICP)	MDL	0.2	---	1.3	ND	0.0035 J	ND	---
Hardness as calcium carbonate	N/A	mg/L	Hardness, Total	MRL	---	---	---	20	30	180	---
Hydroxide Alkalinity	N/A	mg/L	Alkalinity	MDL	---	---	---	ND	ND	ND	---
Iron	7439-89-6	mg/L	Metals (ICP)	MRL	0.3	---	---	0.26 B	**2.4 B7**	**7.9 B7**	---
Lead	7439-92-1	mg/L	Metals (ICP)	MDL	0.025	---	0.015	ND	ND	ND	---
Magnesium	7439-95-4	mg/L	Metals (ICP)	MRL	---	35	---	0.93	1.7	11.5	---
Manganese	7439-96-5	mg/L	Metals (ICP)	MRL	0.3	---	---	0.0069 B	0.040 B	**2.8 B7**	---
Mercury	7439-97-6	mg/L	Mercury (CVAA)	MDL	0.0007	---	0.002	ND	ND	ND	---
Nickel	7440-02-0	mg/L	Metals (ICP)	MDL	0.1	---	---	ND	0.0087 J	0.0053 J	---
Potassium	9/7/7440	mg/L	Metals (ICP)	MRL	---	---	---	0.91 B	1.1 B	11.0 B7	---
Selenium	7782-49-2	mg/L	Metals (ICP)	MDL	0.01	---	0.05	ND	ND	ND	---
Silver	7440-22-4	mg/L	Metals (ICP)	MDL	0.05	---	---	ND	ND	ND	---
Sodium	7440-23-5	mg/L	Metals (ICP)	MRL	20	---	---	11.7	10.8	**57.2**	---
Thallium	7440-28-0	ug/L	Metals (ICP/MS)	MRL	---	0.5	2	0.0083 J	0.015 J	ND	---
Total Kjeldahl Nitrogen	N/A	mg/L	Nitrogen, Total Kjeldahl	MDL	---	---	---	ND	0.22	5.8	---
Vanadium	7440-62-2	mg/L	Metals (ICP)	MDL	---	---	---	ND	0.0038 J	ND	---
Vinyl chloride	75-01-4	ug/L	Volatile Organic Compounds (GC/MS)	MDL	2	---	2	ND	ND	ND	ND
Zinc	7440-66-6	mg/L	Metals (ICP)	MDL	---	2	---	ND	0.0066 J	ND	---

Reg 1	NY-TOGs_GA-WtrClass_StdValues_June2004NY TOGs 1.1.1: Water Quality Stds & Guidance Values: GA Water Class for Standard Values; Eff. June 2004
Reg 2	NY-TOGs_GA-WtrClass_GuidValues_June2004 NY TOGs 1.1.1: Water Quality Stds & Guidance Values: GA Water Class for Guidance Values; Eff. June 2004
Reg 3	USEPA - Primary Drinking Water Standards USEPA - Primary Drinking Water Standards

B = Compound was found in the blank and sample.
J = Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.
B7 = Target analyte detected in method blank at or above method reporting limit. Concentration found in the sample was 10 times above the concentration found in the blank.

Value in **BOLD** indicates reported concentration exceeds one or more of Regulatory Standards or Guidance Values.