D&B ENGINEERS AND ARCHITECTS, P.C.
KNOWN AS DVIRKA AND BARTILUCCI CONSULTING ENGINEERS

330 Crossways Park Drive, Woodbury, New York 11797-2015
516-364-9890 • 718-460-3634 • Fax: 516-364-9045 • www.dvirkaandbartilucci.com

November 19, 2014

Mr. Andrew M. Wilson, P.E.
Department of Program Management
Long Island Rail Road
Mail Code: 1913
144-41 94th Avenue
Jamaica, NY 11435

Re: Supplemental Groundwater Investigation
LIRR Yaphank Landfill
D&B No. 3548

Dear Mr. Wilson:

D&B Engineers and Architects, P.C. (D&B) is providing this Letter Report to the Long Island Rail Road (LIRR) to document the findings of the Supplemental Investigation completed at the LIRR Yaphank Site in October 2014. This investigation was completed in accordance with the Letter Work Plan drafted by D&B on September 24, 2014.

As you are aware, during a September 17, 2014 meeting between representatives of the LIRR and the Town of Brookhaven, it was agreed that the LIRR would install two additional groundwater monitoring wells in off-site locations to the west-southwest of the westernmost portion of the Site.

Completed Scope

The Supplemental Investigation was completed in accordance with the Letter Work Plan, dated September 24, 2014. The following discussion outlines the monitoring well installation and sampling activities completed from October 13 through 24, 2014.

Groundwater Monitoring Well Installation and Development

On October 13 and 14, 2014 a total of two groundwater monitoring wells (MW-21 and MW-22) were installed west/southwest of the Site. The locations of the monitoring wells are depicted on Figure 1, provided as Attachment 1. As shown on Figure 1, these wells were installed west of River Road, approximately 100 feet west of the westernmost property boundary of the Site within LIRR property. All

well installation activities were performed by Delta Well and Pump, Inc. (Delta), under subcontract to D&B. Prior to undertaking the work, the LIRR and Delta arranged for the mark out of all underground utilities within the work area to avoid impacting any subsurface utilities.

During the advancement of each monitoring well, soil samples were collected continuously and logged for geology, inspected for evidence of contamination (e.g. staining or petroleum odors), and screened for organic vapors utilizing a Photoionization detector (PID). In addition, the depth to water at each monitoring well location was verified. Both monitoring wells were installed utilizing a tracked all-terrain hollow stem auger drill rig. Monitoring well MW-21 was completed to a total depth of 13 feet below grade and monitoring well MW-22 was completed to a total depth of 17 feet below grade. Boring logs associated with the monitoring wells are provided in Attachment 2.

Both of the wells were constructed with 2 inch diameter Schedule 40 PVC with 10 feet of 0.02 inch slotted screens. The annular space around the well screen was backfilled with gravel extending a minimum of one foot below the bottom of the well screen to 1 to 2 feet above the screen. The annular space around the well riser was sealed with bentonite pellets extending 1 to 2 feet above the sand filter pack and completed with a cement mixture to approximately 1 foot below grade. The monitoring wells were completed with locking well caps ("J"-plugs) and MW-21 was finished with a steel protective "stick-up" while MW-22 was finished with a flush-mounted steel manhole cover set in concrete. The monitoring well construction logs are provided as Attachment 2.

Several days after installation, each monitoring well was developed by Delta with oversight by D&B by pumping and surging. Given the sandy formation in which the wells are installed, development of each well was completed in short order with each well yielding water with a turbidity of well below 50 NTUs (nephelometric turbidity units) in less than two hours of pumping. In addition, D&B had Delta redevelop existing monitoring well MW-07 given this well was also sampled as part of the Supplemental Investigation. Consistent with the newly installed wells, MW-07 quickly achieved a turbidity well below 50 NTUs.

Groundwater Sampling

Groundwater sampling activities were conducted on October 24, 2014 and consisted of the collection of groundwater samples from one existing monitoring well MW-07 and the two newly installed monitoring wells.

Prior to collection of groundwater samples, water level measurements were conducted from eight existing groundwater wells and the two newly installed monitoring wells. The water level measurements are provided as Attachment 3. Water level measurements were collected to determine local groundwater flow direction.

Groundwater samples were collected by D&B from the existing well MW-07 (located on the southern corner of the property), as well as the two newly installed wells. Portable 12-volt low-flow bladder pumps with disposable tubing were used to purge and sample each well using USEPA low-flow sampling techniques. During well purging, field instruments were utilized to measure temperature, dissolved oxygen, pH, conductivity and turbidity. After the field parameters stabilized, the groundwater samples were collected and placed in laboratory-supplied sample bottles. All samples were labeled and placed in a cooler with bagged ice sufficient to cool the samples to 4°C. During the sampling, the Town of Brookhaven's environmental consultant was allowed to obtain representative groundwater samples for their own analysis.

The collected groundwater samples were submitted to Chemtech Consulting Group, Inc. (Chemtech) for both filtered and unfiltered Target Analyte List (TAL) metals and mercury analysis by USEPA Methods 6010B and 7470A, respectively. All analyses were conducted utilizing NYSDEC 7/05 Analytical Services Protocol (ASP) methods, or latest version, that are at least as stringent as USEPA CLP protocols. NYSDEC ASP Category B data deliverable packages and Electronic Data Deliverables (EDDs in EQuIS format) were provided by the laboratory for all analyses.

Data Usability Summary Report (DUSR)

The data package produced by Chemtech is provided as Attachment 4 and has been reviewed for completeness and compliance with NYSDEC quality assurance and quality control (QA/QC) requirements, as well as the requirements for development of Data Usability Summary Reports as listed in Appendix 2B of the DER-10 Technical Guidance for Site Investigations and Remediation dated May 2010. NYSDEC ASP Category B deliverable data package has been submitted for the sample delivery group (F4474). The findings of the data review process are summarized below and the data validation checklist is provided in Attachment 5.

All samples were analyzed within the method-specified holding times. All blanks, calibrations, spikes, duplicates and serial dilutions were within QC limits. No other problems were found with the sample results. All results have been deemed valid and usable, as qualified above, for environmental assessment purposes

Findings

A water table contour map depicting groundwater flow is provided as Attachment 6. As shown on the figure, groundwater in the vicinity of the west end of the Yaphank Site flows in a southerly direction. The observed direction of groundwater flow in this area of the site is consistent with previously completed studies.

The results of the October 24, 2014 groundwater sampling event are summarized on Table 2 provided in Attachment 3. Based on the results of the groundwater sampling, metals were not detected at concentrations exceeding their respective NYSDEC Class GA groundwater standards or guidance values with only one exception. As shown on Table 2, iron was detected at a concentration exceeding the NYSDEC Class GA Standard in the unfiltered sample collected from monitoring well MW-22 at a concentration of 550 micrograms per liter (ug/l). The NYSDEC Class GA Standard for iron is 300 ug/l. However, the filtered sample collected from monitoring well MW-22 exhibited iron at a relatively low concentration of 25.4 ug/l, which is well below the NYSDEC Class GA Standard of 300 ug/l. Further, iron is not a contaminant of concern as it is found naturally occurring in the environment throughout Long Island including its groundwater.

Of particular note, lead, which was previously detected above its NYSDEC Class GA Standard of 25 ug/l in monitoring well MW-07 in 2003 at unfiltered and filtered concentrations of 49 ug/l and 48 ug/l, respectively, was not detected at concentrations exceeding the NYSDEC Class GA Standard during the October 24, 2014 groundwater sampling event. Further, lead was only detected during the October 24, 2014 groundwater sampling event in the unfiltered sample collected from monitoring well MW-07 at a relatively low concentration of 9.45 ug/l, which is well below the NYSDEC Class GA Standard of 25 ug/l. All remaining lead analyses were reported by the laboratory as not detected.

Based on the results of this Supplemental Groundwater Investigation, D&B has concluded no further investigation activities are warranted at this time.

If you have any questions and/or comments, please do not hesitate to contact us at (516) 364-9890, Ext. 3068.

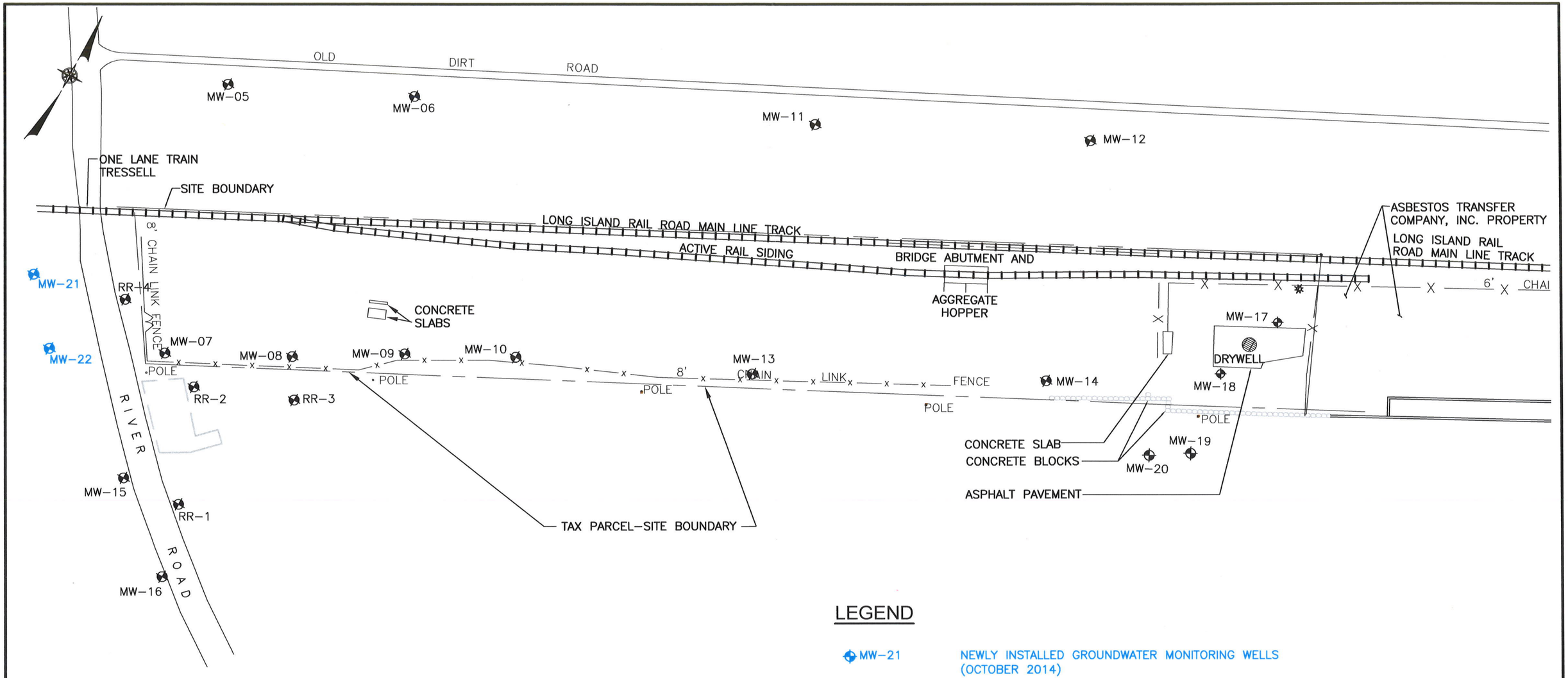
Very truly yours,

Thomas P. Fox, P.G.
Vice President

TPFt/cf,nc
Attachments
•3548\TPF111214AMW_Ltr(R04)

ATTACHMENT 1

Well Location Map



LEGEND

MW-21	NEWLY INSTALLED GROUNDWATER MONITORING WELLS (OCTOBER 2014)
RR-1	LOCATION OF SF DHS – SCDHS GROUNDWATER MONITORING WELL
MW-05	EXISTING GROUNDWATER MONITORING WELL
— x — x — x — x —	EXISTING FENCE
——— – ——— – ———	SITE BOUNDARY

0 100 200

SCALE IN FEET

SOURCE: 1997 SURVEY, COTILLA ASSOCIATES; 1999 SURVEY, YEC INC.; 2004 SURVEY, NELSON AND POPE; TAX MAPS; 1969 AERIAL PHOTOGRAPH, LKB

F:\3548\2523-FIG1.dwg, 11x17, 11/12/2014 1:10:50 PM, kalesius

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

LONG ISLAND RAIL ROAD - YAPHANK SITE
SUPPLEMENTAL SITE INVESTIGATION

GROUNDWATER MONITORING WELL LOCATIONS

FIGURE 1

ATTACHMENT 2

Boring Logs and Well Construction Logs

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

	Project No.: 3548 **Project Name:** LIRR – Yaphank Landfill	**Boring No.:** MW-21 **Sheet** 1 **of** 1 **By:** Paul Barusich
Drilling Contractor: Delta **Drill Rig:** Track mounted **Date Started:** 10/14/14 **Date Completed:** 10/14/14	**Geologist:** Paul Barusich **Drilling Method:** HSA **Drive Hammer Weight:** 140 lbs	**Boring Completion Depth:** 13' **Ground Surface Elevation:** --- **Boring Diameter:** 6"

Depth (ft.)	No.	Type	Rec.	Blow Count Per 6"	Sample Description
0'-5'	1	HA	60"	--	0-1' Brown-tan, organic matter, some fine to medium subangular SAND, trace silt, poorly sorted, loose, moist, no staining, no odor. 1'-5' Tan, fine to medium subangular SAND, trace silt, loose, moist, wet approximately 4' bgs., no staining, no odor.
5'-7'	2	SS	12"	4, 5 6, 6	Tan, fine to medium subangular SAND and fine to coarse subangular GRAVEL, poorly sorted, loose, wet, no staining, no odor.
7'-9'	3	SS	10"	4, 9 8, 9	Same as above.
9'-11'	4	SS	10"	3, 2 3, 6	Same as above.
11'-13'	5	SS	12"	7, 4 6, 9	Tan, fine to medium subangular SAND, trace fine to coarse subangular gravel, well sorted, loose, wet, no staining, no odor.

Sample Types:
HA = Hand Auger
SS = Splitspoon

NOTES:
Monitoring well MW-21 installed in borehole.

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

Project No.: 3548
Project Name: LIRR – Yaphank Landfill

Boring No.: MW-22
Sheet 1 **of** 1
By: Paul Barusich

Drilling Contractor: Delta
Drill Rig: Track mounted
Date Started: 10/13/14
Date Completed: 10/13/14

Geologist: Paul Barusich
Drilling Method: HSA
Drive Hammer Weight: 140 lbs

Boring Completion Depth: 17'
Ground Surface Elevation: ---
Boring Diameter: 6"

Depth (ft.)	No.	Type	Rec.	Blow Count Per 6"	Sample Description
0'-5'	1	HA	60"	--	0-1' Brown, fine to medium subangular SAND, trace organic matter and silt, well sorted, loose, moist, no staining, no odor. 1'-5' Tan-orange, fine to medium subangular SAND, trace rounded coarse gravel, poorly sorted, loose, moist, no staining, no odor.
5'-7'	2	SS	12"	2, 7 6, 5	Tan, fine to coarse subangular SAND and fine to coarse subrounded GRAVEL, poorly sorted, loose, moist, wet approximately 5.5' bgs, no staining, no odor.
7'-9'	3	SS	12"	2, 2 3, 3	Tan, fine to medium subangular SAND, trace fine to medium subangular gravel, poorly sorted, loose, wet, no staining, no odor.
9'-11'	4	SS	8"	1, 2 2, 3	Tan, fine to medium subangular SAND, trace fine to medium subangular gravel, poorly sorted, loose, wet, no staining, no odor.
11'-13'	5	SS	12"	5, 3 4, 6	Same as above.
13'-15'	6	SS	12"	2, 3 7, 13	Tan, fine to medium subangular SAND, some fine to coarse subrounded gravel, poorly sorted loose, wet, no staining, no odor.
15'-17'	7	SS	12"	20, 14 10, 13	15'-15.5' Same as above. 15.5'-16' 1" diameter rounded quartz, trace tan, fine to medium subangular sand, poorly sorted, loose, wet, no staining, no odor.

Sample Types:
HA = Hand Auger
SS = Splitspoon

NOTES:
Monitoring well MW-22 installed in borehole.

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

Well Construction Log

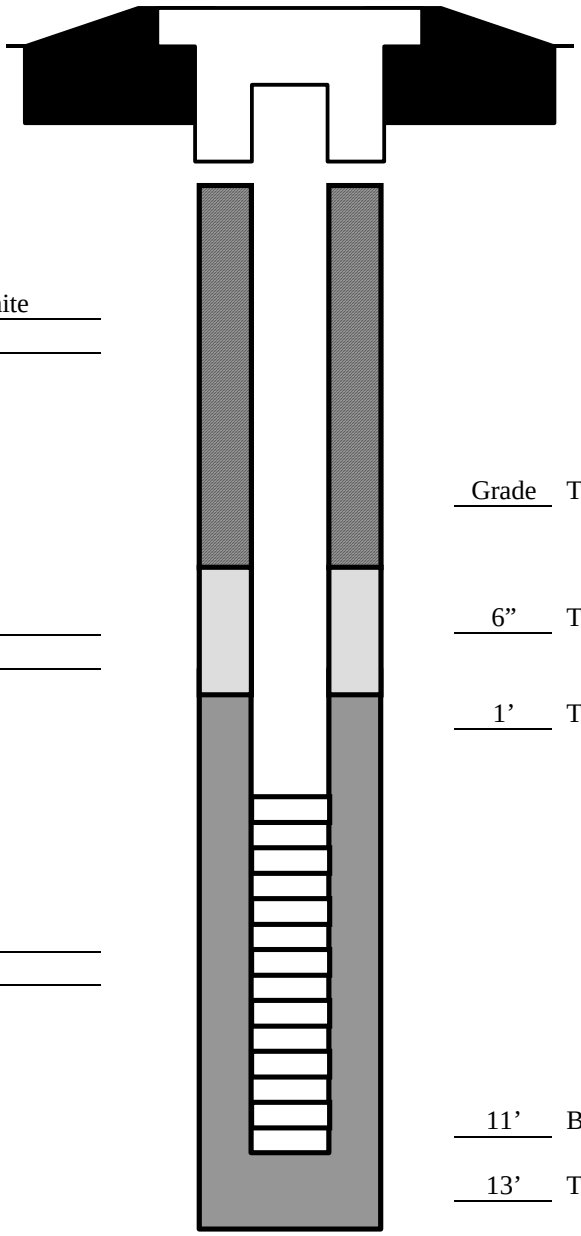
Site LIRR – Yaphank Landfill Job Number 3548 Well No. MW-21

Total Depth 14’ Surface Elevation _____ Top Riser Elevation _____

Water Levels (Depth, Date, Time) 2.73’ bgs, 10/17/14, 8:55am Date Installed 10/14/14

Riser Dia. 2” Material PVC Length 4’
Screen Dia. 2” Material PVC Length 10’ Slot Size 0.02”

SCHEMATIC



Surface Seal Type
Stickup (aprox 3’)
Locking well cover

Ground Surface
_____ Riser Elevation
_____ Bottom Surface Seal

Grout Type Cement/bentonite

Grade Top Seal

Seal Type Bentonite

6” Top Sand Pack (bgs)

1’ Top Screen (bgs)

Sand Pack Type Gravel
Size #0

11’ Bottom Screen (bgs)

13’ Total Depth of Boring (bgs)

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

Well Construction Log

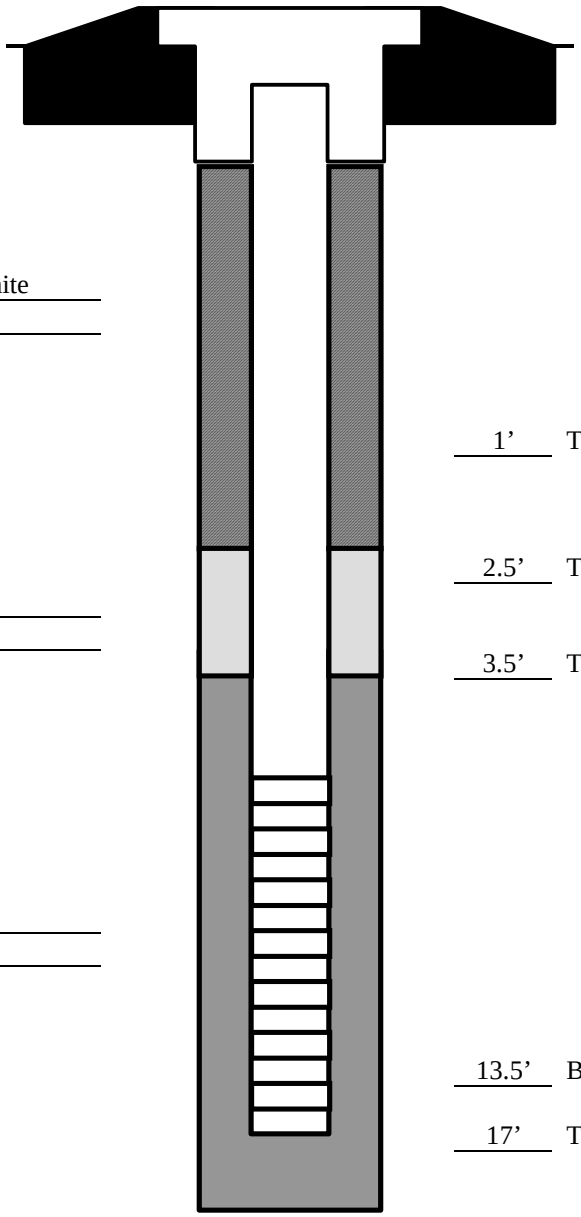
Site LIRR – Yaphank Landfill Job Number 3548 Well No. MW-22

Total Depth 14’ Surface Elevation _____ Top Riser Elevation _____

Water Levels (Depth, Date, Time) 5.10’, 10/17/14, 9:40am Date Installed 10/13/14

Riser Dia. 2” Material PVC Length 4’
Screen Dia. 2” Material PVC Length 10’ Slot Size 0.02”

SCHEMATIC



Surface Seal Type
Concrete
Flush manhole

Ground Surface
_____ Riser Elevation
_____ Bottom Surface Seal

Grout Type Cement/bentonite

1’ Top Seal

2.5’ Top Sand Pack

Seal Type Bentonite

3.5’ Top Screen

Sand Pack Type Gravel
Size #0

13.5’ Bottom Screen

17’ Total Depth of Boring

ATTACHMENT 3

Data Tables

TABLE 1
LONG ISLAND RAILROAD
YAPHANK SITE
WATER LEVEL MEASUREMENTS AND
SURVEYED WELL ELEVATIONS

Monitoring Well Source	Monitoring Well ID	Ground Elevation (feet msl)	Top of PVC Elevation (feet msl)	Depth to Water (feet)[1]	Groundwater Elevation (feet msl)
2003 Site Investigation Wells	MW-5	40.14	42.45	21.67	20.78
	MW-7	29.35	31.12	11.03	20.09
	MW-8	33.97	36.68	na	na
	MW-9	50.04	52.68	32.44	20.24
	MW-15	23.54	23.14	3.41	19.73
	MW-16	22.90	22.45	2.93	19.52
2014 Supplemental Groundwater Investigation Wells	MW-21	23.58	25.54	5.50	20.04
	MW-22	25.17	24.74	4.85	19.89
	RR-2	25.89	25.67	5.71	19.96
	RR-4	29.90	29.86	9.79	20.07

Notes:

[1]Depth to water from top of PVC casing as measured on October 24, 2014

na: not avalible well obstructed

msl: mean sea level

TABLE 2
LONG ISLAND RAIL ROAD YAPHANK SITE
SUPPLEMENTAL INVESTIGATION
GROUNDWATER SAMPLES
TOTAL DISSOLVED TARGET ANALYTE LIST (TAL) METALS

Sample ID	MW-07	MW-07	MW-21	MW-21	MW-22	MW-22	NYSDEC Class GA
Sampling Date	10/24/2014	10/24/2014	10/24/2014	10/24/2014	10/24/2014	10/24/2014	Standard
Sample type	Total	Dissolved	Total	Dissolved	Total	Dissolved	or Guidance Value
Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
METALS							
Aluminum	117	19.3 J	101	19.8 J	498	26.9 J	--
Antimony	U	U	U	U	U	U	3
Arsenic	U	U	U	U	U	U	25
Barium	24.5 J	23 J	24.9 J	22.8 J	28.6 J	23.5 J	1000
Beryllium	U	U	U	U	U	U	3
Cadmium	U	U	U	U	U	U	5
Calcium	3,940	4,120	3,520	3,270	6,900	6,090	--
Chromium	U	U	U	U	U	U	50
Cobalt	U	U	U	U	U	U	--
Copper	2.02 J	U	U	U	U	U	200
Iron	71.3	24.8 J	65.2	13.6 J	***550***	25.4 J	300
Lead	9.45	U	U	U	U	U	25
Magnesium	1,480	1,510	1,580	1,470	2,260	1,970	35,000
Manganese	23.3	16.5	43.8	32	30.4	14.8	300
Mercury	U	U	U	U	U	U	0.7
Nickel	U	U	U	U	U	U	100
Potassium	734 J	761 J	763 J	702 J	854 J	695 J	--
Selenium	U	U	U	U	U	U	10
Silver	U	U	U	U	U	U	50
Sodium	18,400	18,900	19,300	18,000	18,500	16,200	20,000
Thallium	U	U	U	U	U	U	0.5
Vanadium	U	U	U	U	U	U	--
Zinc	21.2	22.3	U	U	U	U	2,000

Footnotes/Qualifiers:

ug/l: Micrograms per liter

--: Not analyzed or no standard

U: Analyzed for but not detected

J: Estimated value or limit

Exceeds Class GA Standard or Guidance Value

ATTACHMENT 4

Chemtech Laboratory Data Package

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

DATA FOR

METALS

PROJECT NAME : LIRR YAPHANK SITE SUPPLEMENTAL INVESTIGATION

DVIRKA & BARTILUCCI

330 Crossways Park Drive

Woodbury, NY - 11797

Phone No: 516-364-9890

ORDER ID : F4474

ATTENTION : Thomas P. Fox

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Date : 11/03/2014

Dear Thomas P. Fox,

8 water samples for the **LIRR Yaphank Site Supplemental Investigation** project were received on **10/27/2014.** The analytical fax results for those samples requested for an expedited turn around time may be seen in this report. Please contact me if you have any questions or concerns regarding this report.

The invoice for this workorder is also attached to the e-mail.

Regards,

Corey J. Petitt

908-728-3148

Corey@chemtech.net

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. F4474
QUOTE NO.
COC Number 033027

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: Divisa FBertolucci
ADDRESS: 330 Crossways Park Drive
CITY: Woodbury STATE: NY ZIP: 11797
ATTENTION: Tom Fox
PHONE: 516-364-9890 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: LIRR Yaphank Site Supplemental Investigation
PROJECT NO.: LOCATION: Yaphank, NY
PROJECT MANAGER: Tom Fox
e-mail: TFox@db-eng.com
PHONE: 516-364-9890 FAX:

CLIENT BILLING INFORMATION

BILL TO: Same PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: Standard DAYS *
HARD COPY: 1 DAYS *
EDD: 1 DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☒ EDD Format: EQuIS Format
✱ Others ASP-B deliverables ✱

ANALYSIS

1 TAL Metals - total
2 TAL Metals - Filter in lab ✱
3 4 5 6 7 8 9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1 (HNO_3)	2 (ICE)	3	4	5	6	7	8	9	COMMENTS
1.	MW-22	W		X	10/24/14	0911		X	X								
2.	MW-21	W		X	10/24/14	1006		X	X								
3.	Field Blank 10-24-14	W		X	10/24/14	1039		X	X								
4.	MW-07	W		X	10/24/14	1146		X	X								
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

COMMENTS: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME: 12:00 pm 10-27-14	RECEIVED BY: 1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 1470 10-27-14	RECEIVED FOR LAB BY: 3. Corey Petitt

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: ✱ unpreserved 500 mL bottle for lab Filter ✱

Cooler Temp. 5°C
Ice in Cooler?: Yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	MW-22	SDG No.:	F4474
Lab Sample ID:	F4474-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	498		1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-39-3	Barium	28.6	J	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-70-2	Calcium	6900		1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7439-89-6	Iron	550		1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7439-95-4	Magnesium	2260		1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7439-96-5	Manganese	30.4		1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:03	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-09-7	Potassium	854	J	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-23-5	Sodium	18500		1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010
7440-66-6	Zinc	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:03	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	MW-21	SDG No.:	F4474
Lab Sample ID:	F4474-02	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	101		1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-39-3	Barium	24.9	J	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-70-2	Calcium	3520		1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7439-89-6	Iron	65.2		1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7439-95-4	Magnesium	1580		1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7439-96-5	Manganese	43.8		1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:05	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-09-7	Potassium	763	J	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-23-5	Sodium	19300		1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010
7440-66-6	Zinc	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:36	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	FIELDBLANK-10-24-14	SDG No.:	F4474
Lab Sample ID:	F4474-03	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	50	U	1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-39-3	Barium	50	U	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-70-2	Calcium	1000	U	1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7439-89-6	Iron	50	U	1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7439-95-4	Magnesium	1000	U	1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7439-96-5	Manganese	10	U	1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:07	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-09-7	Potassium	1000	U	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-23-5	Sodium	1000	U	1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010
7440-66-6	Zinc	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:40	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
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E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	MW-07	SDG No.:	F4474
Lab Sample ID:	F4474-04	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	117		1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-39-3	Barium	24.5	J	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-70-2	Calcium	3940		1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-50-8	Copper	2.02	J	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7439-89-6	Iron	71.3		1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7439-92-1	Lead	9.45		1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7439-95-4	Magnesium	1480		1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7439-96-5	Manganese	23.3		1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:09	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-09-7	Potassium	734	J	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-23-5	Sodium	18400		1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010
7440-66-6	Zinc	21.2		1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:44	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
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OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	MW-22	SDG No.:	F4474
Lab Sample ID:	F4474-05	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	26.9	J	1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-39-3	Barium	23.5	J	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-70-2	Calcium	6090		1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7439-89-6	Iron	25.4	J	1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7439-95-4	Magnesium	1970		1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7439-96-5	Manganese	14.8		1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:15	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-09-7	Potassium	695	J	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-23-5	Sodium	16200		1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010
7440-66-6	Zinc	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:49	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	DISSOLVED METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
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OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	MW-21	SDG No.:	F4474
Lab Sample ID:	F4474-06	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	19.8	J	1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-39-3	Barium	22.8	J	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-70-2	Calcium	3270		1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7439-89-6	Iron	13.6	J	1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7439-95-4	Magnesium	1470		1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7439-96-5	Manganese	32		1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:17	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-09-7	Potassium	702	J	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-23-5	Sodium	18000		1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010
7440-66-6	Zinc	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:53	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	DISSOLVED METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
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E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	FIELDBLANK-10-24-14	SDG No.:	F4474
Lab Sample ID:	F4474-07	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	50	U	1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-39-3	Barium	50	U	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-70-2	Calcium	1000	U	1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7439-89-6	Iron	50	U	1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7439-95-4	Magnesium	1000	U	1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7439-96-5	Manganese	10	U	1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:20	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-09-7	Potassium	1000	U	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-23-5	Sodium	1000	U	1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010
7440-66-6	Zinc	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 16:57	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	DISSOLVED METALS-TAL				

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CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Dvirka & Bartilucci	Date Collected:	10/24/14
Project:	LIRR Yaphank Site Supplemental Investigation	Date Received:	10/27/14
Client Sample ID:	MW-07	SDG No.:	F4474
Lab Sample ID:	F4474-08	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	19.3	J	1	6.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-36-0	Antimony	25	U	1	6.25	6.25	25	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-38-2	Arsenic	10	U	1	2.5	2.5	10	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-39-3	Barium	23	J	1	4	12.5	50	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-41-7	Beryllium	3	U	1	0.7	0.75	3	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-43-9	Cadmium	3	U	1	0.5	0.75	3	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-70-2	Calcium	4120		1	31.8	250	1000	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-47-3	Chromium	5	U	1	1.1	1.25	5	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-48-4	Cobalt	15	U	1	3.75	3.75	15	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-50-8	Copper	10	U	1	2	2.5	10	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7439-89-6	Iron	24.8	J	1	12.5	12.5	50	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7439-92-1	Lead	6	U	1	1.5	1.5	6	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7439-95-4	Magnesium	1510		1	32.5	250	1000	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7439-96-5	Manganese	16.5		1	1.7	2.5	10	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7439-97-6	Mercury	0.2	U	1	0.1	0.1	0.2	ug/L	10/28/14 08:00	10/28/14 18:22	SW7470A
7440-02-0	Nickel	20	U	1	4.2	5.0	20	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-09-7	Potassium	761	J	1	38.8	250	1000	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7782-49-2	Selenium	10	U	1	4.8	5.0	10	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-22-4	Silver	5	U	1	1.25	1.25	5	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-23-5	Sodium	18900		1	13.9	250	1000	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-28-0	Thallium	20	U	1	2.4	5.0	20	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-62-2	Vanadium	20	U	1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010
7440-66-6	Zinc	22.3		1	5	5.0	20	ug/L	10/28/14 08:00	10/28/14 17:01	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	DISSOLVED METALS-TAL				

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ATTACHMENT 5

Data Validation Checklist

DATA VALIDATION CHECKLIST

Project Name:	LIRR Yaphank Landfill
Project Number:	3548 -N
Sample Date(s):	October 24, 2014
Sample Team:	Marc Morgenstern
Matrix/Number of Samples:	Water/ 3 (MW-07, MW-21 & MW-22) Field Blanks/ 1
Analyzing Laboratory:	Chemtech, Mountainside, NJ
Analyses:	Metals: Total and dissolved by SW846 Method 6010B & mercury by Method 7470A
Laboratory Report No:	F4474 Date:11/10/2014

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results		X		X	
2. Parameters analyzed		X		X	
3. Method of analysis		X		X	
4. Sample collection date		X		X	
5. Laboratory sample received date		X		X	
6. Sample analysis date		X		X	
7. Copy of chain-of-custody form signed by Lab sample custodian		X		X	
8. Narrative summary of QA or sample problems provided		X		X	

QA - quality assurance

Comments:

The data packages have been reviewed in accordance with the NYSDEC 7/05 ASP Quality Assurance/ Quality Control (QA/QC) requirements. A validation was conducted on the data package and any applicable qualification of the data was determined using the USEPA National Functional Guidelines of Inorganic Data Review, October 2013, method performance criteria, and Dvirka and Bartilucci Consulting Engineers, a Division of D&B Engineers and Architects, P.C. professional judgment. The qualification of data discussed within this data validation checklist did not impact the usability of the sample results.

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times		X		X	
2. Blanks					
A. Preparation and calibration blanks		X		X	
B. Field blanks		X		X	
3. Initial calibration verification %R		X		X	
4. Continuing calibration verification %R		X		X	
5. CRDL standard %R		X		X	
6. Interference check sample %R		X		X	
7. Laboratory control sample %R		X		X	
8. Spike sample %R		X		X	
9. Post digestive spike sample %R					
10. Duplicate %RPD		X		X	
11. Serial dilution check %D		X		X	
12. Total verse dissolved results		X		X	

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:
Performance was acceptable

DATA VALIDATION AND QUALIFICATION SUMMARY

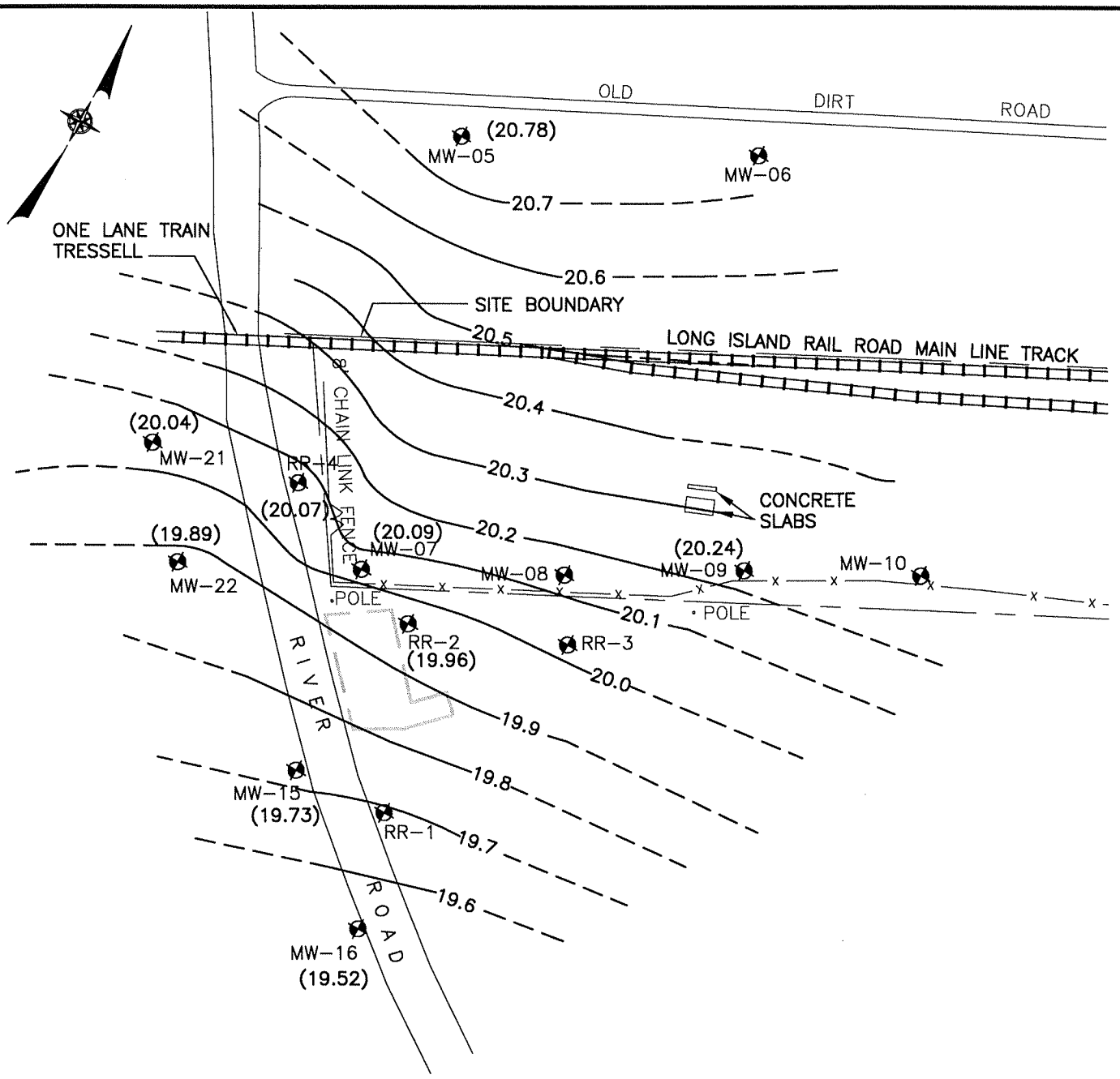
Laboratory Numbers:F4474

Sample ID	Analyte(s)	Qualifier	Reason(s)
Metals			
Qualification of the data was not necessary.			

VALIDATION PERFORMED BY & DATE:	Donna M. Brown 11/11/2014
VALIDATION PERFORMED BY SIGNATURE:	

ATTACHMENT 6

Groundwater Contour Map



LEGEND

MW-22	MONITORING WELL
(19.89)	GROUNDWATER ELEVATION MEASUREMENTS COLLECTED ON OCTOBER 24, 2014
	GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

0 100 200

SCALE IN FEET

SOURCE: 1997 SURVEY, COTILLA ASSOCIATES; 1999 SURVEY, YEC INC.; 2004 SURVEY, NELSON AND POPE; TAX MAPS; 1969 AERIAL PHOTOGRAPH, LKB

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

LONG ISLAND RAIL ROAD - YAPHANK SITE
SUPPLEMENTAL SITE INVESTIGATION

GROUNDWATER CONTOUR MAP
OCTOBER 24, 2014

SCALE:

FIGURE 2

F:\3548\2523-FIG2.dwg, 2, 11/18/2014 11:15:30 AM, kalesius