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August 27, 2013

USACE, Baltimore District
CENAB-EN, Attn: Andrea Graham
Rm 10000-M
10 South Howard Street
Baltimore, MD 21201

Re: Fort Hamilton Final Sixteenth Quarterly System Operations Report
AAFES Retail Fuel Facility, UST Spill Remediation
Fort Hamilton, Brooklyn, NY
W912DY-10-D-0025-DA02

Dear Ms. Graham:

The PIKA-Pirnie JV is pleased to provide USACE Baltimore District with this Final Sixteenth Quarterly System Operations Report for Fort Hamilton, NY. The report covers the period April 1, 2013 through June 30, 2013. A hard copy has also been provided to Mr. Koutroubis at Fort Hamilton and an electronic copy (on compact disc) has been provided to Mr. Jonathan Kolleeny at the New York State Department of Environmental Conservation (NYSDEC).

Please call me at (410) 923-7828 if you have any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "B. R. Stempowski".

Brian R. Stempowski, PE, PMP
Project Manager
PIKA-Pirnie

cc: Ms. M.E. Maly, AEC
Mr. P. Koutroubis, Fort Hamilton
Mr. J. Kolleeny, NYSDEC



FINAL

**SIXTEENTH QUARTERLY SYSTEM OPERATIONS REPORT
(April 1, 2013 through June 30, 2013)**

**ARMY & AIR FORCE EXCHANGE SERVICE
RETAIL FUEL FACILITY (BLDG 200)
UNDERGROUND STORAGE TANK (UST) SPILL REMEDIATION
SPILL NO. 9802727**

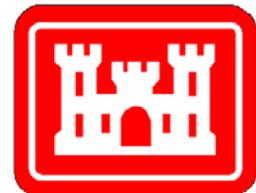
**U.S. ARMY GARRISON FORT HAMILTON
BROOKLYN, NEW YORK**

AUGUST 2013

Contract No.: W912DY-10-D0025/Delivery Order DA02

Prepared For:

U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
10 S. Howard St.
Baltimore, Maryland 21201

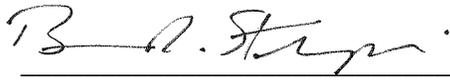


Prepared By:

PIKA-PIRNIE JV, LLC
12723 Capricorn Drive, Suite 500
Stafford, Texas 77477



I have reviewed this document and certify that it contains accurate content and is sufficient to guide project execution.



PIKA-Pirnie Senior Project Manager
Brian R. Stempowski, PMP

8/27/13

Date



Principal Engineer
Cullen M. Flanders, P.E.

8/27/13

Date



PIKA-Pirnie Associate Project Manager
Andrew G. Korik

8/27/13

Date

TABLE OF CONTENTS

Section	Page
1.0 SITE ACTIVITIES.....	1-1
2.0 PROBLEMS ENCOUNTERED AND CORRECTIVE ACTIONS.....	2-1
3.0 TASKS TO BE INITIATED IN THE NEXT REPORTING PERIOD.....	3-1
4.0 MONTHLY O&M ACTIVITIES.....	4-1
4.1 SYSTEM SAMPLING.....	4-1
4.2 TABLES, FIGURES AND APPENDICES.....	4-1
4.3 SYSTEM OPERATION / TIME ON SITE.....	4-2
5.0 POSITIVE OR NEGATIVE OBSERVATIONS.....	5-1

LIST OF APPENDICES

APPENDIX A	PIPING AND INSTRUMENTATION DIAGRAM
APPENDIX B	LNAPL MASS REMOVAL CALCULATIONS
APPENDIX C	LABORATORY ANALYTICAL DATA (PROVIDED ON CD)

LIST OF TABLES

Title
Table 1 Monitoring and Extraction Well Status
Table 2 Treatment Unit Information
Table 3 Treatment System Compliance Data Table
Table 4 Groundwater Concentrations
Table 5 Historical Groundwater Data Tables

LIST OF FIGURES

Title
Figure 1 Site Location Map
Figure 2 Site Plan
Figure 3 Groundwater Elevation Contour Map – April 18, 2013
Figure 4 Groundwater Elevation Contour Map – May 30, 2013
Figure 5 Groundwater Elevation Contour Map – June 26, 2013
Figure 6 Groundwater Concentration Map – June 26, 2013

LIST OF ACRONYMS AND ABBREVIATIONS

AAFES	Army & Air Force Exchange Service
CD	Compact Disc
LNAPL	Light Non-Aqueous Phase Liquid
MPE	Multiphase Extraction
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
SVE	Soil Vapor Extraction
USACE	United States Army Corps of Engineers

The following presents the System Operations Report for the Sixteenth Quarter of Operations (April 1, 2013 through June 30, 2013) for the Remediation System located at the Army & Air Force Exchange Service (AAFES) Retail Fuel Facility - Building 200, U.S. Army Garrison at Fort Hamilton in Brooklyn, New York (the Site).

1.0 SITE ACTIVITIES

- i.** On April 4, 2013, Paul Boyko arrived on site at 1000 hours to conduct routine Operation and Maintenance (O&M) at the site. The system was up on arrival but with low vacuum. It was determined that the extraction blower had one broken drive belt. Paul shut down the system at 1043. Paul left the site at 1345. Time onsite was 3.75 hours.
- ii.** On April 5, 2013, Paul Boyko and Jason Waldron arrived on site at 1330 hours to install new drive belts on the extraction blower. The system was restarted at 1409. Paul and Jason also performed routine O&M. Paul and Jason left the site at 1500. Time onsite was 1.5 hours for a total of 3.0 man-hours.
- iii.** On April 18, 2013, Paul Boyko arrived on site at 0645 hours to collect New York City Department of Environmental Protection (NYCDEP) system effluent samples. Paul also gauged the site wells and performed routine O&M. Paul left the site at 1415 hours. Time onsite was 7.5 hours.
- iv.** On April 30, 2013, Paul Boyko arrived on site at 1215 hours in response to an auto-dialer alarm on April 30, 2013 at 1041 hours. The system was down on arrival due to high temperature on the extraction blower. The exhaust and heater thermostat were adjusted and the vacuum was lowered. The system was turned back on at 1245 hours and monitored. Paul left the site at 1415 hours. Time onsite was 2.0 hours.
- v.** On May 8, 2012, Paul Boyko arrived on site at 1030 hours to conduct routine O&M. Paul also adjusted the compressor drive belt and checked the oil. Paul left the site at 1500 hours. Time onsite was 4.5 hours.
- vi.** On May 30, 2013, Paul Boyko arrived on site at 0715 hours to conduct routine O&M. Paul also gauged the site wells. Paul left the site at 1015 hours. Time onsite was 3.0 hours.
- vii.** On June 12, 2013, Paul Boyko arrived on site at 0700 hours to conduct routine O&M. While onsite Paul noted the lid on one of the liquid carbon vessels was rusted through and starting to leak. No environmental impact was observed at the trailer or surrounding

area. The system was shut down at 0915. Paul left the site at 0945 hours. Time onsite was 2.75 hours.

- viii.** On June 13, 2013, Paul Boyko arrived on site at 0945 hours to install a new lid and gasket and restart the system. The system was restarted at 10:29. Paul also conducted routine O&M. Paul left the site at 1130 hours. Time onsite was 1.75 hours.
- ix.** On June 25, 2013, Paul Boyko arrived on site at 0800 hours to perform a site inspection with Brian Stempowski and perform routine O&M. Paul left the site at 0930 hours. Time onsite was 1.5 hours.
- x.** On June 26, 2013, Paul Boyko and Greg Szczupak arrived on site at 0700 hours to collect quarterly groundwater samples. Paul and Greg also gauged the site wells and performed routine O&M. Paul and Greg left the site at 1515 hours. Time onsite was 8.25 hours for a total of 16.5 man-hours.
- xi.** On June 28, 2013, Paul Boyko arrived on site at 0700 hours to collect quarterly United States Army Corps of Engineers (USACE) water samples and quarterly air samples. Paul also modified the existing multiphase extraction (MPE) system into a soil vapor extraction (SVE) system by cutting the drop tubes, amending the wellheads and turning off the groundwater phase of the system. The system modification was approved by the New York State Department of Environmental Conservation (NYSDEC) as part of the Remedial Action Work Plan on June 18, 2013. The rationale for the system modification is presented in Section 5.0. The SVE system was online at 1510 hours. Paul left the site at 1530 hours. Time onsite was 8.5 hours.
- xii.** On June 30, 2013, Paul Boyko arrived on site at 0745 hours in response to an auto-dialer alarm on June 28, 2013 at 2338 hours. The system was down on arrival due to a high alarm in the vapor liquid separator. The system was restarted with the groundwater phase of the system on (in order to treat any recovered liquid that accumulates in the liquid separator) at 0814. Paul also conducted routine O&M. Paul left the site at 0915 hours. Time onsite was 1.5 hours.

2.0 PROBLEMS ENCOUNTERED AND CORRECTIVE ACTIONS

- i.** On April 4, 2013, the system was shut down after it was determined the extraction blower had one broken and one worn drive belt. Two new drive belts were installed on August 5, 2013 and the system was restarted.
- ii.** On April 30, 2013, the system experienced a high temperature alarm on the extraction blower. The exhaust and heater thermostat were adjusted and the vacuum was lowered. The problem was resolved upon departure.
- iii.** On June 12, 2013, it was observed the lid on one of the liquid carbon vessels was rusted through and a minor leak was appearing on the lid surface. No environmental impact was observed at the trailer or surrounding area. On June 13, 2013 a new lid and gasket was installed and the system was restarted.
- iv.** On June 28, 2013, the system experienced a high alarm in the vapor liquid separator. The groundwater phase of the system was turned off on June 28, 2013 after the conversion of the system from MPE to SVE. Due to the continued recovery of moisture, the system was restarted with the groundwater phase of the system on.

3.0 TASKS TO BE INITIATED IN THE NEXT REPORTING PERIOD

- i.** Continue operating and maintaining the SVE system.
- ii.** Complete required system water, air stream and groundwater sampling.
- iii.** Implement the Remedial Action Work Plan which was approved by NYSDEC on June 18, 2013 (see Section 5.0).

4.0 MONTHLY O&M ACTIVITIES

4.1 SYSTEM SAMPLING

During the quarter, system effluent water sampling was completed on April 18, 2013. System effluent samples were taken on a quarterly basis in accordance with the Groundwater Discharge Permit Renewal. System air stream sampling was conducted on June 28th. Also during the quarter, the required USACE influent and effluent sampling was conducted on June 28th. Results for these samples are used for process control purposes and are not for compliance demonstration of the treatment system. Quarterly groundwater samples for this quarter were collected on June 26, 2013. The complete analytical data and results associated with the noted sampling are included in the electronic format of this report.

4.2 TABLES, FIGURES AND APPENDICES

- Site Location and Site Map are shown in **Figures 1 and 2**.
- Groundwater elevation contour maps are included as **Figures 3, 4 and 5**. These figures show slight deviations in groundwater flow conditions throughout the reporting period based on a rising water table. However, the primary flow direction remains consistent and generally to the west.
- Groundwater concentrations are shown on **Figure 6**.
- Monitoring and Extraction well data are provided on **Table 1**.
- System operational data are included on **Table 2**.
- Groundwater discharge and system compliance data is presented on **Table 3**.
- Groundwater concentrations from the 16th quarter are presented in **Table 4**.
- Historical groundwater data is included on **Table 5**.
- The extraction and treatment system Piping and Instrumentation Diagram and SVE well and vault detail is included in **Appendix A**.
- Calculations of light non-aqueous phase liquid (LNAPL) mass recovered are shown in **Appendix B**.
- All analytical data collected during the reporting period, along with the entire report, are provided in electronic format on the compact disc (CD) provided as **Appendix C**.

4.3 SYSTEM OPERATION / TIME ON SITE

The system operated for approximately 2,097.5 hours out of a possible 2,184 hours during the period between April 1, 2013 and June 30, 2013. Every effort was made to minimize downtime however necessary system repairs and alarms caused the system to be down during this period for approximately 86.5 hours. The system operated 96 percent of all available hours during the reporting period. Personnel were on site 56.25 hours during the quarter.

5.0 POSITIVE OR NEGATIVE OBSERVATIONS

All system effluent water samples analyzed during the period were compliant with the NYCDEP discharge permit levels. All effluent air samples analyzed during the period were compliant with the Stipulation Agreement with the NYSDEC. From April to June 2013, the system removed approximately 18 gallons of LNAPL based on influent analytical data (**Appendix B**). The MPE remediation system has been operating since July 2009 and has removed approximately 1,620 gals of LNAPL total. Historically, LNAPL has been observed at MW-1 and MW-5. During the sixteenth quarter LNAPL was observed in MW-01 at a thickness ranging from 0.19 feet (April) to 0.01 feet (June) and was not present in MW-5 (**Table 1**). A small amount of LNAPL was also detected in MW-4 (0.02 feet). This was the first occurrence of LNAPL in this well. A sorbent sock was placed in the well to recover the LNAPL.

In order to increase mass recovery and further focus treatment at the site to expedite case closure, a Remedial Action Work Plan was submitted on to NYSDEC on May 31, 2013 and approved on June 18, 2013. The work plan outlined a multistep approach to future site remediation including:

- Additional characterization data collection through the installation of an angled well beneath the station building near existing well MW-5. This work is scheduled for July/August 2013.
- Conversion of the MPE system to operate in SVE only mode. This was completed on June 28, 2013.
- Conducting a series of groundwater pumping/vacuum extraction events.
- Performing an in-situ chemical oxidation pilot test from an injection well to be installed in the vicinity of existing well MW-5 and evaluation of this technology for full scale application.

Based on the data presented in this Report, the following conclusions and recommendations can be made with respect to remediation system performance and groundwater quality at the Site:

- The remediation approach at the Site has been effective at removing LNAPL from MW-1 and MW-5. LNAPL was last detected in MW-5 during December 2012 (0.05 feet). The average LNAPL thickness of MW-1 has also decreased over time, including each month this quarter, and was most recently detected at a thickness of 0.01 feet in June 2013.
- The minor detection of LNAPL at MW-4 in June 2013 does not appear indicative of a significant presence of LNAPL in that area. A sorbent sock was installed in the well at the time of detection and as of July 29, 2013 there was no further LNAPL detected in MW-4.

- Constituents of concern were detected above their closure threshold in the groundwater samples collected from wells MW-3 (only benzene slightly) and MW-5 only. MW-1 and MW-4 were not sampled because LNAPL was present (as shown on Table 1). Historically MW-1 and MW-4 have exceeded closure thresholds. The system modification to SVE coupled with the planned groundwater pumping/vacuum extraction events is expected to further increase the hydrocarbon mass recovery thereby resulting in further declining groundwater concentration trends. The Seventeenth Quarterly System Operations Report will further evaluate the effectiveness of SVE.
- Upon further/sustained reduction in LNAPL thickness at MW-1 and dissolved-phase concentrations at MW-5 the in-situ chemical oxidation pilot test will be implemented adjacent to MW-5. This is expected to further reduce dissolved-phase concentrations in the vicinity of MW-5. If effective as expected, the in-situ technology will be expanded to treat other areas of the site as necessary.

Tables

Table 1
Monitoring and Extraction Well Status
U.S. Army Garrison Fort Hamilton
Brooklyn, New York

Description	4/18/2013	5/30/2013	6/26/2013	Description	4/18/2013	5/30/2013	6/26/2013	Description	4/18/2013	5/30/2013	6/26/2013
MW-1 (Elevation)	98.93	98.93	98.93	MW - 2 (Elevation)	99.44	99.44	99.44	MW- 3 (Elevation)	99.00	99.00	99.00
DTW	23.71	24.67	21.90	DTW	25.58	23.51	19.07	DTW	23.94	24.8	21.17
DTP	23.52	24.6	21.89	DTP	NPD	NPD	NPD	DTP	NPD	NPD	NPD
LNAPL THICKNESS	0.19	0.07	0.01	LNAPL THICKNESS	0	0	0	LNAPL THICKNESS	0.0	0.0	0.0
GWELEV	75.22	74.26	77.03	GWELEV	73.86	75.93	80.37	GWELEV	75.06	74.20	77.83
CORRECTED GWELEV	75.36	74.31	77.04	CORRECTED GWELEV	73.86	75.93	80.37	CORRECTED GWELEV	75.06	74.20	77.83
PID READING - BREATHING ZONE (ppm)	0.0	0.2	0.0	PID READING - BREATHING ZONE (ppm)	0.1	0.1	0.0	PID READING - BREATHING ZONE (ppm)	0.0	0.0	0.0
PID READING - HEADSPACE (ppm)	0.8	0.7	0.0	PID READING - HEADSPACE (ppm)	1.1	1.7	0.0	PID READING - HEADSPACE (ppm)	0.0	0.0	0.0
MW - 4 (Elevation)	98.10	98.10	98.10	MW - 5 (Elevation)	98.74	98.74	98.74	MW - 6 (Elevation)	99.10	99.10	99.10
DTW	23.95	24.85	17.43	DTW	22.78	23.82	19.95	DTW	25.42	25.95	24.03
DTP	NPD	NPD	17.41	DTP	NPD	NPD	NPD	DTP	NPD	NPD	NPD
LNAPL THICKNESS	0.0	0.0	0.02	LNAPL THICKNESS	0.0	0.0	0.0	LNAPL THICKNESS	0.0	0.0	0.0
GWELEV	74.15	73.25	80.67	GWELEV	75.96	74.92	78.79	GWELEV	73.68	73.15	75.07
CORRECTED GWELEV	74.15	73.25	80.68	CORRECTED GWELEV	75.96	74.92	78.79	CORRECTED GWELEV	73.68	73.15	75.07
PID READING - BREATHING ZONE (ppm)	0.0	0.0	0.0	MPE WELL VACUUM (in. Hg)	NMT	NMT	NMT	PID READING - BREATHING ZONE (ppm)	0.0	0.0	0.0
PID READING - HEADSPACE (ppm)	0.0	0.0	165.0	PID READING - BREATHING ZONE (ppm)	0.8	0.0	0.0	PID READING - HEADSPACE (ppm)	0.0	0.0	0.0
				PID READING - HEADSPACE (ppm)	2.8	2	43.3				
MW - 7 (Elevation)	99.47	99.47	99.47	MPE-1 (Elevation)	Could not access well.			MPE-2 (Elevation)	98.75	98.75	NMT
DTW	20.03	21.1	17.68	DTW				23.54	24.50		
DTP	NPD	NPD	NPD	DTP				NPD	NPD		
LNAPL THICKNESS	0.0	0.0	0.0	LNAPL THICKNESS				0.0	0.0		
GWELEV	79.44	78.37	81.79	GWELEV				75.21	74.25		
CORRECTED GWELEV	79.44	78.37	81.79	CORRECTED GWELEV				75.21	74.25		
PID READING - BREATHING ZONE (ppm)	0.1	0.0	0.0	MPE WELL VACUUM (in. Hg.)				NMT	NMT		
PID READING - HEADSPACE (ppm)	0.0	0.0	0.0	PID READING - BREATHING ZONE (ppm)				0.0	0.0		
				PID READING - HEADSPACE (ppm)	0.0	0.3					
MPE-3 (Elevation)	98.14	98.14	NMT	MPE-4 (Elevation)	99.19	99.19	NMT	MPE-5 (Elevation)	Could not access well.		
DTW	21.10	22.05		DTW	22.55	23.44					
DTP	NPD	NPD		DTP	NPD	NPD					
LNAPL THICKNESS	0.0	0.0		LNAPL THICKNESS	0.0	0.0					
GWELEV	77.04	76.09		GWELEV	76.64	75.75					
CORRECTED GWELEV	77.04	76.09		CORRECTED GWELEV	76.64	75.75					
MPE WELL VACUUM (in. Hg.)	(off)	(off)		MPE WELL VACUUM (in. Hg.)	(off)	(off)					
PID READING - BREATHING ZONE (ppm)	0.0	0.0		PID READING - BREATHING ZONE (ppm)	0.0	0.0					
PID READING - HEADSPACE (ppm)	0.3	0.3	PID READING - HEADSPACE (ppm)	0.5	0.4						
MPE-6 (Elevation)	98.93	98.93	NMT	MPE-7 (Elevation)	97.42	97.42	NMT				
DTW	22.38	23.27		DTW	18.78	19.83					
DTP	NPD	NPD		DTP	NPD	NPD					
LNAPL THICKNESS	0.0	0.0		LNAPL THICKNESS	0.0	0.0					
GWELEV	76.55	75.66		GWELEV	78.64	77.59					
CORRECTED GWELEV	76.55	75.66		CORRECTED GWELEV	78.64	77.59					
MPE WELL VACUUM (in. Hg.)	NMT	NMT		MPE WELL VACUUM (in. Hg.)	(off)	(off)					
PID READING - BREATHING ZONE (ppm)	0.0	0.0		PID READING - BREATHING ZONE (ppm)	0.1	0.0					
PID READING - HEADSPACE (ppm)	0.0	0.0	PID READING - HEADSPACE (ppm)	0.0	0.0						

Notes:
DTP - Depth to Product.
DTW- Depth to Water.
LNAPL - Light Non-aqueous Phase Liquid.
NMT - No Measurement Taken.
NPD - No Product Detected.
DTW / DTP measurements denote depth (in feet) from top of casing.
LNAPL measurements denote thickness of product in feet.
GW Elev measurements denote feet above sea level.
Corrected Groundwater Elevation (Corrected GWElev) Calculation: Corrected GW Elev = Well Elevation - Corrected Depth to Water
Corrected Depth to Water = DTW - (Specific Gravity of Gasoline x LNAPL Thickness)
LNAPL Thickness = DTW - DTP
Specific Gravity of Gasoline = 0.739

Table 2
Treatment Unit Information
U.S. Army Garrison Fort Hamilton
Brooklyn, New York

Description	4/4/2013	4/5/2013	4/18/2013	4/30/2013	5/8/2013	5/30/2013	6/12/2013	6/13/2013	6/25/2013	6/26/2013	6/28/2013	6/30/2013
MPE System Blower Vacuum (in Hg)	1.0	7.0	7.0	6.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
MPE System Blower Flow Rate (CFM)	30	250	250	250	250	250	250	250	250	250	250	250
Influent Vapor Concentration (ppm)	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	32.6	NMT
Influent LEL %	0	0	0	0	0	0	0	0	0	0	0	0
Enclosure LEL%	0	0	0	0	0	0	0	0	0	0	0	0
Air Stripper Effluent Concentration (ppm)	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	0.0	NMT
Effluent Vapor Concentration (ppm)	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	NMT	16.0	NMT
MPE Wells Operating	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6	MPE-2, MW-5, MPE-6
Blower Discharge Air Temperature (Fahrenheit)	145	144	145	143	163	164	168	166	167	168	160	162
Vapor Extraction Blower Hours	25875.15	25875.25	26180.19	26471.70	26662.29	27186.73	27498.50	27500.34	27786.51	27809.24	27857.27	27873.46
Particle Filter Differential Pressure (in wc)	NMT	2.2	2.0	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Blower Pitot Tube Differential Pressure (in wc)	NMT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
OWS Pump Pressure (psi)	NMT	35.0	36.0	33.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
LNAPL Collected During Period (gallons)	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.	Sheen in OWS.
Air Stripper Blower Pressure (in. wc)	NMT	6.0	12.1	15.2	16.0	17.8	15.5	15.6	15.6	15.8	13.3	15.0
Air Stripper Blower Hours	3573.5	3573.6	3878.5	4171.8	4362.4	4886.8	5198.6	5200.5	5486.6	5509.4	5557.4	5573.7
Air Stripper Discharge Pump Pressure (psi)	NMT	27.0	27.0	25.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Bag Filter 1 Pressure 1 (psi)	NMT	6.0	6.0	7.0	6.0	7.0	6.0	6.0	6.0	5.0	5.0	6.0
Bag Filter 1 Pressure 2 (psi)	NMT	5.0	5.0	4.0	5.0	6.0	5.0	5.0	5.0	4.0	4.0	5.0
Bag Filter 2 Pressure 1 (psi)	NMT	7.0	7.0	7.0	7.0	8.0	7.0	7.0	6.0	5.0	5.0	7.0
Bag Filter 2 Pressure 2 (psi)	NMT	5.0	5.0	4.0	4.0	6.0	5.0	5.0	5.0	4.0	4.0	5.0
Effluent Water Temperature (degrees C.)	NMT	NMT	22.0	NMT	22.6	NMT						
Effluent Water pH (s.u.)	NMT	NMT	7.23	NMT	7.30	NMT						
Effluent Water Meter Discharge Reading	186632	186632	188791	190458	191450	195890	201046	201056	204320	204476	204826	204868
Air Compressor (psi)	50.0	50.0	49.0	48.0	48.0	48.0	50.0	50.0	50.0	50.0	50.0	50.0
Technician (s)	Paul Boyko	Paul Boyko and Jason Waldron	Paul Boyko	Paul Boyko and Greg Szczupak	Paul Boyko							

Notes:
NMT - No Measurement Taken.
NR - Remedial System Not Running.
OWS - Oil Water Separator.
in Hg - Inches of Mercury.
CFM - Cubic Feet per Minute.
ppm - Parts per Million.
LEL - Lower Explosive Limit.
in wc - Inches of water column.

Table 4
 Groundwater Concentrations - June 26, 2013
 U.S. Army Garrison Fort Hamilton
 Brooklyn, New York

Parameter (CAS Number)	TOGS 1.1.1 Values	6 NYCRR Values	MW01	MW02	MW03	MW04	MW05	MW06	MW07	Trip Blank
			(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Benzene (71-43-2)	1 ug/l	1 ug/l	NS	0.6 J	8	NS	79	0.8 J	0.5 J	<0.5
n-Butylbenzene (104-51-8)	5 ug/l	5 ug/l	NS	<1	<1	NS	14	<1	<1	<1
sec-Butylbenzene (135-98-8)	5 ug/l	5 ug/l	NS	<1	<1	NS	6 J	<1	<1	<1
tert-Butylbenzene (98-06-6)	5 ug/l	5 ug/l	NS	<1	<1	NS	<2	<1	<1	<1
Ethylbenzene (100-41-4)	5 ug/l	5 ug/l	NS	<0.8	2 J	NS	490	<0.8	<0.8	<0.8
Isopropylbenzene (98-82-8)	5 ug/l	5 ug/l	NS	<1	2 J	NS	50	<1	<1	<1
p-Isopropyltoluene (99-87-6)	5 ug/l	5 ug/l	NS	<1	<1	NS	4 J	<1	<1	<1
Methyl t-Butyl Ether (MTBE) (1634-04-4)	NR	NVR	NS	<0.5	19	NS	4 J	<0.5	<0.5	<0.5
Naphthalene (91-20-3)	10 ug/l	NVR	NS	<1	1 J	NS	180	<1	<1	<1
n-Propylbenzene (103-65-1)	5 ug/l	5 ug/l	NS	<1	1 J	NS	84	<1	<1	<1
Toluene (108-88-3)	5 ug/l	5 ug/l	NS	0.8 J	2 J	NS	2,400	1 J	0.8 J	<0.7
1,2,4-Trimethylbenzene (95-63-6)	5 ug/l	5 ug/l	NS	<1	7	NS	1,100	<1	<1	<1
1,3,5-trimethylbenzene (108-67-8)	5 ug/l	5 ug/l	NS	<1	7	NS	310	<1	<1	<1
Xylenes (Total) (95-47-6, 108-38-3, 106-42-3)	5 ug/l	5 ug/l	NS	<0.8	13	NS	5,400	<0.8	<0.8	<0.8
Total Benzene (Closure Threshold <100 ug/l)			NS	0.6 J	8	NS	79	0.8 J	0.5 J	NA
Total BTEX (Closure Threshold < 500 ug/l)			NS	1.4 J	25	NS	8,369	1.8 J	1.3 J	NA
Total VOC's (Closure Threshold < 1000 ug/l)			NS	1.4 J	62	NS	10,121	1.8 J	1.3 J	NA

Notes:
 Bold concentration results denotes exceedance of guidance value.
 NVR - No Value Recorded.
 NR - Not Regulated (per Table 3 of TOGS guidance manual).
 NA - Not Applicable.
 NS - Not Sampled (LNAPL Present in well during sampling event).
 J - Estimated.

Table 5
Historical Groundwater Data Tables
U.S. Army Garrison Fort Hamilton
Brooklyn, New York

Well ID	Date	Benzene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-trimethylbenzene	Total Xylenes	Total Benzene	Total BTEX	Total VOC's
TOGS 1.1.1 Values		1 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	nr	10 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	Closure Threshold < 100 ug/l	Closure Threshold < 500 ug/l	Closure Threshold < 1000 ug/l
6 NYCRR Values		1 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	nvr	nvr	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l			
MW-01	12/19/2011	2170	4.1 J	ND	ND	1850	129	ND	3280	639	241	10400	3560	1000	20700	2170	35120	43973.1
	3/15/2012	2680	38.5 J	<50	<100	1860	123	<50	6830	202	192	9250	2440	699	15900	2680	29690	40414.5
	6/26/2012	2800	<100	<50	<100	2180	176	<50	5040	458	247	11200	2750	911	19100	2800	35280	45162
	8/30/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/6/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/19/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-02	6/26/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/12/2008	18.5	NT	NT	NT	52.4	NT	NT	22.8	28.9	NT	120	NT	NT	195	18.5	385.9	437.6
	8/18/2009	ND	NT	NT	NT	6.0	NT	NT	1.8 J	ND	NT	0.96 J	NT	NT	10.4 J	ND	17.36	19.16
	11/18/2009	ND	NT	NT	NT	3.2 J	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	3.2	3.2
	3/10/2010	ND	NT	NT	NT	ND	NT	NT	0.27	ND	NT	ND	NT	NT	ND	ND	0	0.27
	6/28/2010	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	1.6 J	ND	1.6	1.6
	9/9/2010	0.54 J	NT	NT	NT	19.1	NT	NT	3.1	ND	NT	0.55 J	NT	NT	3.9	0.54 J	24.09	27.19
	12/6/2010	0.67 J	NT	NT	NT	19.9	NT	NT	3.5	0.59	NT	0.93 J	NT	NT	10.4	0.67 J	32	36.09
	3/17/2011	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	6/15/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/22/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/19/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/14/2012	ND	2.3	3.9	ND	2.2	10.9	0.99 J	ND	0.46 J	5.4	0.34 J	31.6	ND	7.9	ND	10.44	65.99
	6/25/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	8/30/2012	ND	ND	1.1	ND	ND	2.5	ND	0.62 J	ND	1.8	ND	3.6	ND	ND	ND	2.7	12.32
	2/6/2013	<0.5	1 J	5	<1	<0.8	2 J	<1	2 J	<1	2 J	<0.7	5	<1	4 J	<0.5	<6	21
	3/19/2013	<0.5	<1	<1	<1	<0.8	<1	<1	1 J	<1	<1	<0.7	<1	<1	<0.8	<0.5	<2.8	<12.8
6/26/2013	0.6 J	<1	<1	<1	<0.8	<1	<1	<0.5	<1	<1	0.8 J	<1	<1	<0.8	0.6 J	<3.0	<12.5	
MW-03	11/12/2008	15.2	NT	NT	NT	12.2	NT	NT	30.1	0.73 J	NT	1.5	NT	NT	8.2	15.2	37.1	38.56
	8/18/2009	99.5	NT	NT	NT	5.2	NT	NT	13.7	ND	NT	1	NT	NT	3.8	99.5	109.5	123.2
	11/18/2009	53.9	NT	NT	NT	460	NT	NT	74.8	42.2	NT	ND	NT	NT	3680	53.9	4193.9	4310.9
	3/10/2010	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	7.7	ND	7.7	7.7
	6/28/2010	4.1	NT	NT	NT	0.29 J	NT	NT	7.60	ND	NT	0.26 J	NT	NT	ND	4.1	4.36	11.96
	9/9/2010	7.2	NT	NT	NT	3.0	NT	NT	9.3	ND	NT	0.90 J	NT	NT	1.7 J	7.2	12.8	22.1
	12/6/2010	3.8	NT	NT	NT	3.6	NT	NT	7.1	ND	NT	ND	NT	NT	2.3 J	3.8	9.7	16.8
	3/17/2011	0.40 J	NT	NT	NT	ND	NT	NT	1.8	ND	NT	ND	NT	NT	ND	0.40 J	0.4	2.2
	6/15/2011	2.3	ND	1.6	ND	ND	0.84 J	ND	2.8	ND	ND	ND	ND	ND	ND	2.3	2.3	7.54
	9/22/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/19/2011	ND	ND	1.1	ND	ND	0.92 J	ND	ND	ND	ND	ND	2.5	ND	ND	ND	ND	2.02 J
	3/14/2012	ND	ND	ND	ND	5.4	4.4	ND	0.93 J	ND	3.0	0.42 J	44.3	ND	7.5	ND	13.32	65.95
	6/25/2012	ND	ND	ND	ND	ND	ND	ND	3.0	ND	ND	ND	ND	ND	ND	ND	ND	3.0
	8/30/2012	ND	6.2	14.6	ND	4	45.9	ND	ND	3	51.5	0.26 J	24.3	ND	ND	ND	4.26	149.8
	2/6/2013	26	3 J	6	<1	3 J	25	<1	5	2 J	22	15	59	10	45	26	89	223
3/19/2013	34	<1	<1	<1	<0.8	4 J	<1	18	<1	4 J	30	16	3 J	42	34	106.8	151	
6/26/2013	8	<1	<1	<1	2 J	2 J	<1	19	1 J	1 J	2 J	7	7	13	8	25	<67	

Table 5
Historical Groundwater Data Tables
U.S. Army Garrison Fort Hamilton
Brooklyn, New York

Well ID	Date	Benzene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-trimethylbenzene	Total Xylenes	Total Benzene	Total BTEX	Total VOC's
TOGS 1.1.1 Values		1 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	nr	10 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	Closure Threshold < 100 ug/l	Closure Threshold < 500 ug/l	Closure Threshold < 1000 ug/l
6 NYCRR Values		1 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	nvr	nvr	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l			
MW-04	11/12/2008 -NS	373.0	NT	NT	NT	2180.0	NT	NT	417.0	257.0	NT	2470.0	NT	NT	16500.0	373	21523	22197
	11/12/2008 - FD	274.0	NT	NT	NT	2230.0	NT	NT	346.0	265.0	NT	2480.0	NT	NT	16500.0	274	21484	22095
	8/18/2009	33.8	NT	NT	NT	576.0	NT	NT	65.0	85.9	NT	326.0	NT	NT	2020.0	33.8	2955.8	3106.7
	11/18/2009	53.9	NT	NT	NT	460.0	NT	NT	74.8	42.2	NT	ND	NT	NT	3680.0	53.9	4193.9	4310.9
	3/10/2010	1.4	NT	NT	NT	44.0	NT	NT	ND	3.4	NT	ND	NT	NT	286.0	1.4	331.4	334.8
	6/28/2010	3.2	NT	NT	NT	10.5	NT	NT	ND	6.5	NT	10.1	NT	NT	105	3.2	128.8	135.3
	9/9/2010	26.7	NT	NT	NT	278.0	NT	NT	12.7	33.7	NT	154.0	NT	NT	2470.0	26.7	2928.7	2975.7
	12/6/2010	26.8	NT	NT	NT	292.0	NT	NT	ND	24.8	NT	153.0	NT	NT	2560.0	26.8	3031.8	3056.6
	3/17/2011	7.0	NT	NT	NT	113.0	NT	NT	1.2	55.0	NT	109.0	NT	NT	3070.0	7	3299	3355.2
	6/15/2011	0.98 J	3.5	ND	ND	4.7	8.5	2.1	ND	11.6	ND	3.5	40.9	9.7	145	0.98 J	154.18	230.48
	9/22/2011	ND	ND	ND	ND	ND	8.3	2.1	ND	3.4	13.8	1.2	129	16.7	89.1	ND	90.3	263.6
	12/19/2011	1.2	3.1	ND	ND	0.49 J	7.0	1.1	0.35 J	6.8	3.2	1.9	83.9	ND	74.1	1.2	77.69 J	183.14
	3/14/2012	2.0	ND	ND	ND	6.4	2.6	2.5	0.63 J	14.8	ND	17.3	304	ND	362	2.0	387.7	712.23
	6/26/2012	0.61 J	ND	ND	ND	ND	3.3	ND	ND	7.3	ND	1.9	128	ND	64.4	0.61	66.91	205.51
	8/30/2012	7.4	ND	ND	ND	90.3	26.0	16.2	3.2	38.6	31	59.9	535	50	863	2.0	387.7	712.23
2/6/2013	5 J	190	<2	23	22	68	11	<1	77	80	140	1700	430	4100	5 J	4435	6846	
3/19/2013	46	430	<2	39	20	110	16	5 J	150	170	550	3,000	860	7,200	46	8226	12596	
6/26/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-05	3/10/2010	4.7	NT	NT	NT	117.0	NT	NT	ND	8.2	NT	261.0	NT	NT	1210.0	4.7	1592.7	1600.9
	6/28/2010	414	NT	NT	NT	1680.0	NT	NT	87.8	218	NT	7820.0	NT	NT	14300.0	414	24214	24519.8
	9/9/2010	800.0	NT	NT	NT	842.0	NT	NT	135.0	305.0	NT	9370.0	NT	NT	15100.0	800	26112	26552
	12/6/2010	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/17/2011	97.8	NT	NT	NT	ND	NT	NT	35.8	ND	NT	402.0	NT	NT	1480.0	97.8	1979.8	2015.6
	6/15/2011	689	ND	ND	ND	715	30.1	6.1	139	134	42.4	6240	911	290	7530	689	15174	16726.6
	9/22/2011	788	ND	ND	ND	1700	93.9	ND	60.6	152	153	10200	2120	464	15400	788	28088	31131.5
	12/19/2011	2860	48.3	ND	ND	1990	101	ND	754	375	191	17700	1870	519	14100	2860	36650	40508.3
	3/15/2012	1750	18.8 J	<10	<20	1720	92.7	<10	459	309	148	16200	1550	453	13000	1750	32670	35740.5
	6/25/2012	89.6	<100	<50	<100	<50	<50	<50	28.6 J	<100	<50	577	253	156	1620	89.6	2336.6	3274.2
	8/30/2012	2320	<100	<50	<100	2350	159	50.8	233	609	293	19200	3730	958	20800	2320	44670	50952.8
	2/6/2013	890	10 J	8 J	<5	1,100	61	<5	180	250	99	9,200	1,100	300	8,800	890	19990	21998
	3/19/2013	1,800	15 J	7 J	<5	1,900	86	<5	190	330	140	17,000	1,900	450	15,000	1,800	35700	38818
6/26/2013	79	14	6 J	<2	490	50	4 J	4 J	180	84	2,400	1,100	310	5,400	79	8,369	<10,572	
MW-06	11/12/2008	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	0.37 J	NT	NT	1.5 J	ND	1.87	1.87
	8/18/2009	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	11/18/2009	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	3/10/2010	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	6/28/2010	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	9/9/2010	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	12/6/2010	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND
	3/17/2011	ND	NT	NT	NT	ND	NT	NT	ND	ND	NT	ND	NT	NT	ND	ND	ND	ND

Table 5
Historical Groundwater Data Tables
U.S. Army Garrison Fort Hamilton
Brooklyn, New York

Well ID	Date	Benzene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	Methyl t-Butyl Ether (MTBE)	Naphthalene	n-Propylbenzene	Toluene	1,2,4-Trimethylbenzene	1,3,5-trimethylbenzene	Total Xylenes	Total Benzene	Total BTEX	Total VOC's	
TOGS 1.1.1 Values		1 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	nr	10 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	Closure Threshold < 100 ug/l	Closure Threshold < 500 ug/l	Closure Threshold < 1000 ug/l	
6 NYCRR Values		1 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l	nvr	nvr	5 ug/l	5 ug/l	5 ug/l	5 ug/l	5 ug/l				
MW-06 Continued	6/15/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	
	9/22/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	
	12/19/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	
	3/14/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	
	6/25/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	
	8/30/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	
	2/6/2013	<0.5	<1	<1	<1	<0.8	<1	<1	<0.5	<1	<1	<1	<0.7	<1	<1	<0.8	<0.5	<2.8	<12.3
	3/19/2013	<0.5	<1	<1	<1	<0.8	<1	<1	<0.5	<1	<1	<1	<0.7	<1	<1	<0.8	<0.5	<2.8	<12.3
6/26/2013	0.8 J	<1	<1	<1	<0.8	<1	<1	<0.5	<1	<1	<1	1 J	<1	<1	<0.8	0.8 J	<3.4	<12.9	
MW-07	11/12/2008	0.92 J	NT	NT	NT	11.6	NT	NT	87.8	1.9	NT	9.4	NT	NT	92.3	0.92 J	114.22	203.92	
	8/18/2009	0.49 J	NT	NT	NT	ND	NT	NT	67.5	ND	NT	ND	NT	NT	ND	0.49 J	0.49	67.99	
	11/18/2009	ND	NT	NT	NT	ND	NT	NT	74.4	ND	NT	ND	NT	NT	ND	ND	ND	74.4	
	3/10/2010	ND	NT	NT	NT	ND	NT	NT	14.8	ND	NT	ND	NT	NT	ND	ND	ND	14.8	
	6/28/2010	ND	NT	NT	NT	ND	NT	NT	18.8	ND	NT	ND	NT	NT	ND	ND	ND	18.8	
	9/9/2010	ND	NT	NT	NT	ND	NT	NT	45.4	ND	NT	ND	NT	NT	ND	ND	ND	45.4	
	12/6/2010	ND	NT	NT	NT	ND	NT	NT	55.7	ND	NT	ND	NT	NT	ND	ND	ND	55.7	
	3/17/2011	ND	NT	NT	NT	ND	NT	NT	4.0	ND	NT	ND	NT	NT	ND	ND	ND	4	
	6/15/2011	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	ND	ND	ND	ND	ND	ND	3.5	
	9/22/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	12/19/2011	ND	ND	ND	ND	ND	ND	ND	0.86 J	ND	ND	ND	ND	ND	ND	ND	ND	0.86 J	
	3/14/2012	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	ND	ND	ND	ND	ND	2.2	
	6/25/2012	ND	ND	ND	ND	ND	ND	ND	0.81 J	ND	ND	ND	ND	ND	ND	ND	ND	0.81	
	8/30/2012	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND	2.4	
	2/6/2013	<0.5	<1	<1	<1	<0.8	<1	<1	2 J	<1	<1	<0.7	<1	<1	<0.8	<0.5	<2.8	2	
	3/19/2013	<0.5	<1	<1	<1	<0.8	<1	<1	<0.5	<1	<1	<0.7	1 J	<1	0.9 J	<0.5	<2.8	1.9	
6/26/2013	0.5 J	<1	<1	<1	<0.8	<1	<1	<0.5	<1	<1	0.8 J	<1	<1	<0.8	0.5 J	<2.9	<13.9		

Notes:

nvr - no value recorded.

nr - not regulated as per Table 3 of TOGS guidance manual.

NS - Not Sampled (LNAPL Present in well during sampling event).

ND - Not Detected - All method detection limits are below regulatory guidance values.

> - Sample was below the method detection limit shown.

Bold concentration results denotes exceedance of guidance value.

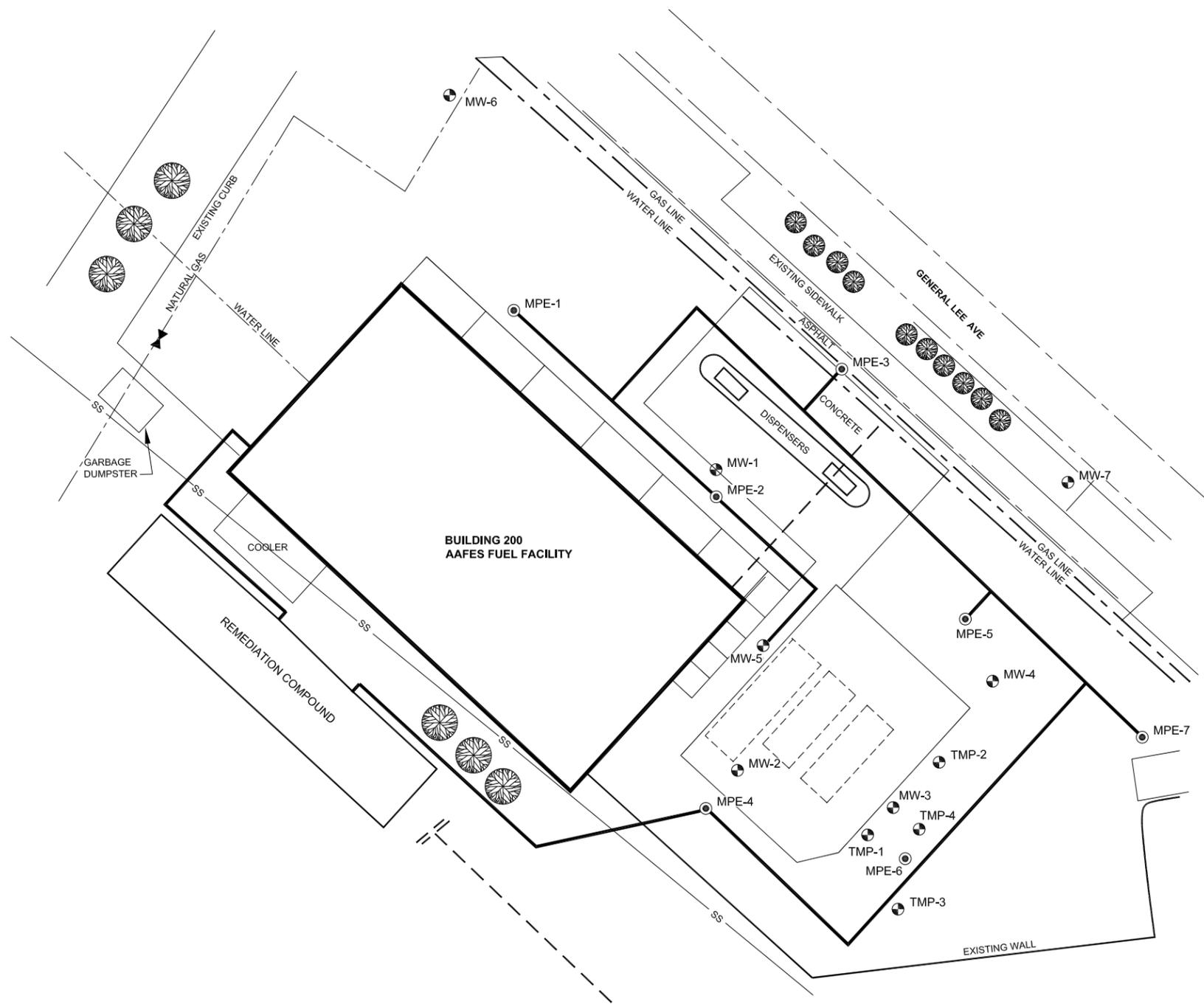
J - Estimated.

NT- Not Tested.

Parameter	Solubility in Water
Benzene	1,280,000 ug/l
EthylBenzene	152,000 ug/l
Toluene	535,000 ug/l
T. Xylenes	167,000 ug/l
Naphthalene	30,000 ug/l

Figures

CITY: SYRACUSE, NY DIM/GROUP: ENV/CAD, DB: R. BASSETT, LD: (Opt) PIC: PM: TM: A. KORIK LYN: ON: OFF: REF: GA: ENV/CAD/SYRACUSE/ACT/06261024/0001/00004/DWG/06261B01.dwg LAYOUT: 2_SAVED: 7/22/2013 6:57 PM ACADVER: 18.1S (LMS TECH) PAGES: 18 PAGES SETUP: PLOT: PLT/STY/LETABLE: PLT/FULL/CTB PLOTTED: 7/22/2013 6:58 PM BY: BASSETT, RICHARD XREFS: IMAGES: 2875160.tif PROJECTNAME: --

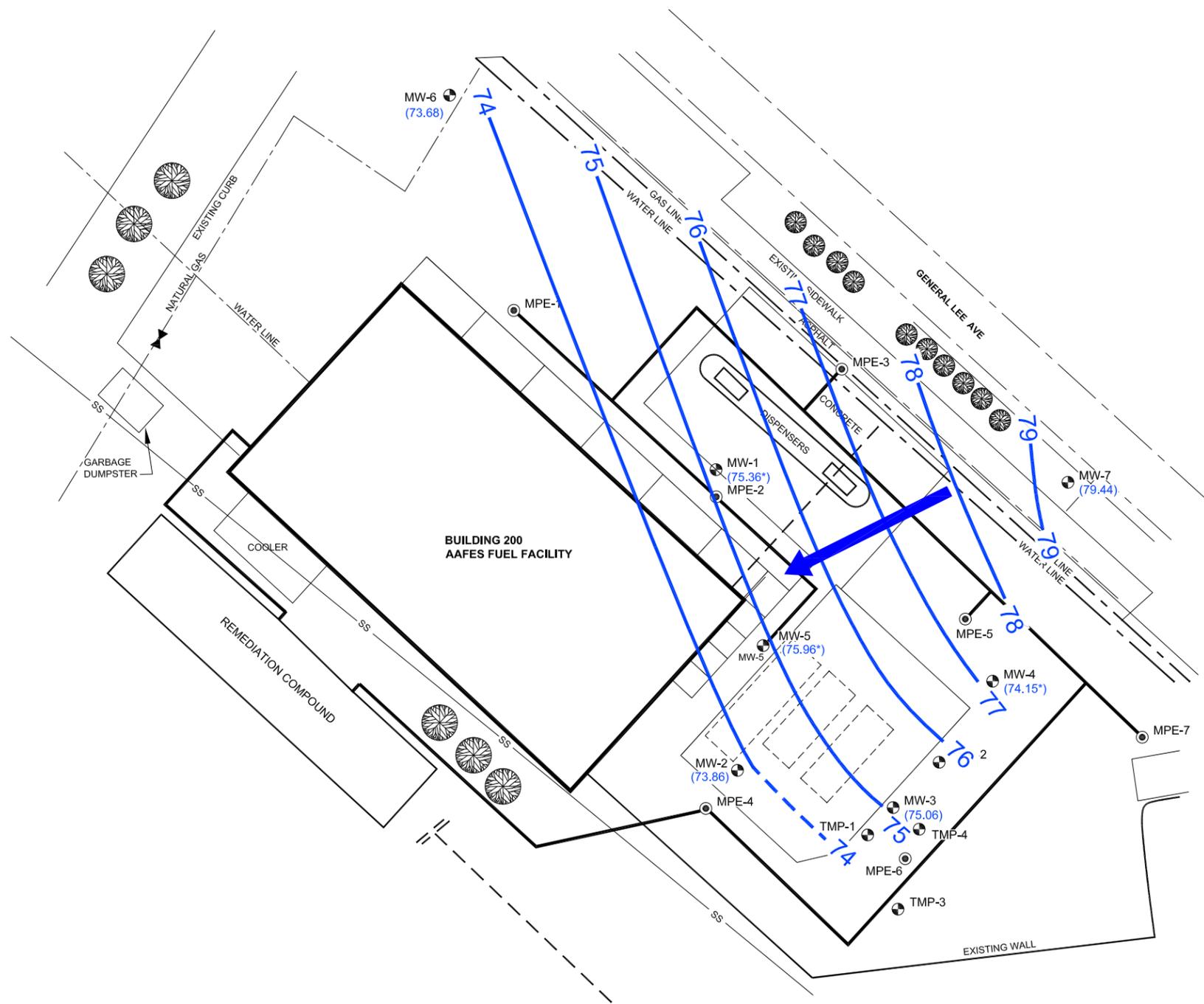


NOTE:
 1. BASE MAP PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT AND PLEXUS SCIENTIFIC.
 2. ALL LOCATIONS AND SCALE ARE APPROXIMATE.

U.S. ARMY CORPS OF ENGINEERS BALTIMORE DISTRICT AAFES STATION, FT. HAMILTON, N.Y.	
SITE MAP	
	FIGURE 2

CITY: SYRACUSE, NY DIM/GROUP: ENV/CAD, DB: R. BASSETT, LD: (Opt) PIC: PM: TM: A. KORIK, LYN: ON: OFF: REF: G:\ENV\CAD\SYRACUSE\ACT\06261024\0001\00004\DWG\06261W06.dwg LAYOUT: 3 SAVED: 7/22/2013 8:56 PM ACADVER: 18.1S (LMS TECH) PAGES: 18.1S (LMS TECH) PLOTTABLE: PLT\FULL.CTB PLOTTED: 7/22/2013 8:56 PM BY: BASSETT, RICHARD

XREFS: IMAGES: 2975160.tif 63.jpg PROJECTNAME: --



LEGEND:

- MW-4 EXISTING MONITORING WELL
- MPE-3 MPE EXTRACTION WELL
- ss SANITARY SEWER LINE
- MPE HEADER PIPE
- UNDERGROUND STORAGE TANKS.
- (75.36) GROUNDWATER ELEVATION (FT)
- 75 GROUNDWATER ELEVATION CONTOUR (FT) (DASHED WHERE INFERRED)
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTE:

1. BASE MAP PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT AND PLEXUS SCIENTIFIC.
2. ALL LOCATIONS AND SCALE ARE APPROXIMATE.
3. * GROUNDWATER ELEVATION CONSIDERED ANOMALOUS AND WAS NOT USED IN CREATING CONTOUR.

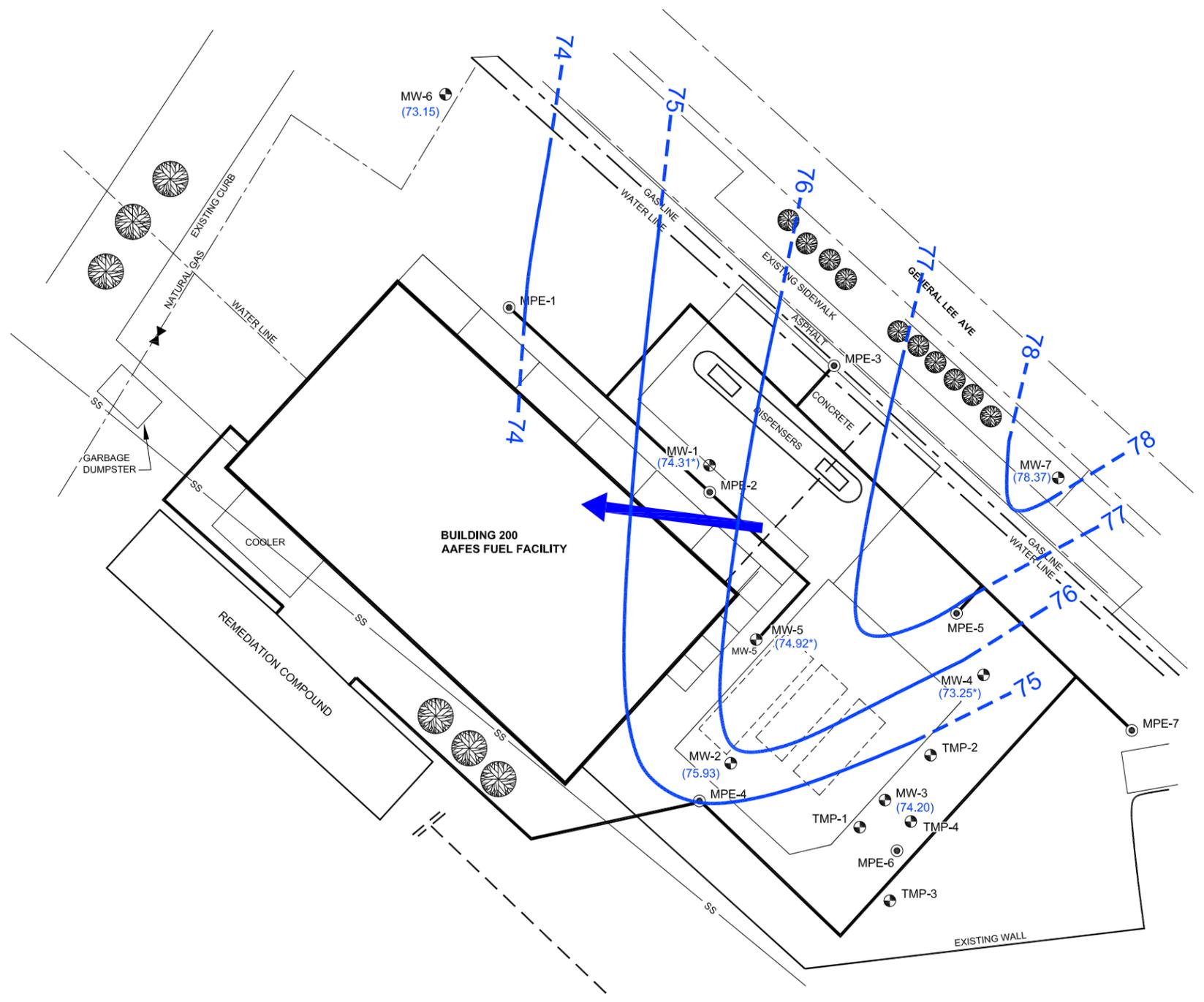
U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT
AAFES STATION, FT. HAMILTON, N.Y.

**GROUNDWATER ELEVATION MAP
APRIL 18, 2013**

PIKA
INTERNATIONAL, INC.
MALCOLM
PIRNIÉ

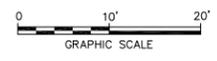
FIGURE
3

CITY: SYRACUSE, NY DIM/GROUP: ENV/CAD, DB: R. BASSETT, LD: (Opt) PIC: PM: TM: A. KORIK LYN: ON: OFF: REF: G:\ENV\CAD\SYRACUSE\ACT\06261024\0001\00004\DWG\06261W07.dwg LAYOUT: 4 SAVED: 7/22/2013 9:17 PM ACADVER: 18.1S (LMS TECH) PAGES: 18.1S (LMS TECH) PLOTTED: 7/22/2013 9:17 PM BY: BASSETT, RICHARD XREFS: IMAGES: G4.jpg PROJECTNAME: ---



- LEGEND:**
- MW-4 EXISTING MONITORING WELL
 - MPE-3 MPE EXTRACTION WELL
 - SS SANITARY SEWER LINE
 - MPE HEADER PIPE
 - UNDERGROUND STORAGE TANKS.
 - (73.15) GROUNDWATER ELEVATION (FT)
 - 75 GROUNDWATER ELEVATION CONTOUR (FT)
(DASHED WHERE INFERRED)
 - APPROXIMATE DIRECTION OF GROUNDWATER FLOW

- NOTE:**
1. BASE MAP PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT AND PLEXUS SCIENTIFIC.
 2. ALL LOCATIONS AND SCALE ARE APPROXIMATE.
 3. * GROUNDWATER ELEVATION CONSIDERED ANOMALOUS AND WAS NOT USED IN CREATING CONTOUR.



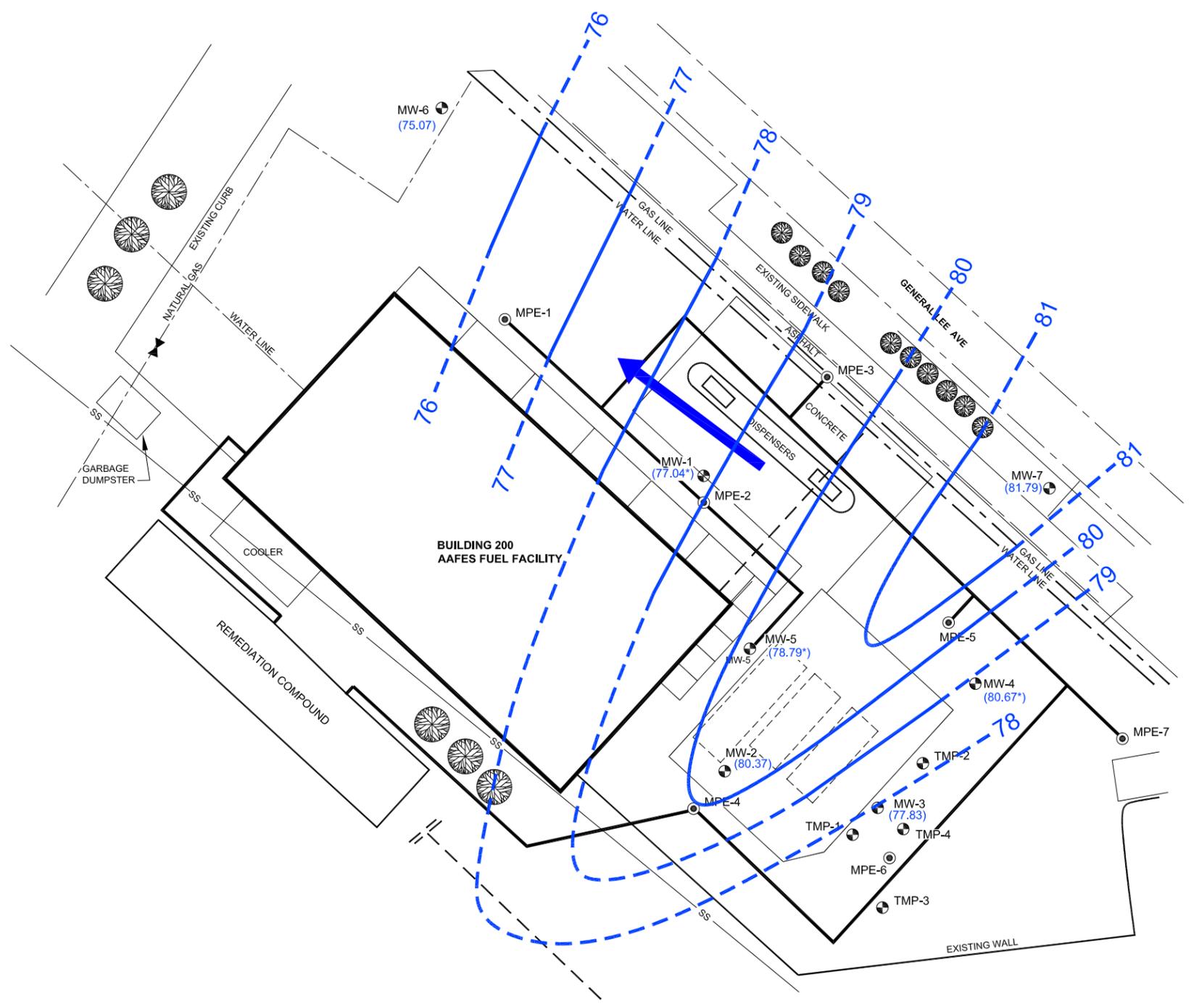
U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT
AAFES STATION, FT. HAMILTON, N.Y.

**GROUNDWATER ELEVATION MAP
MAY 30, 2013**



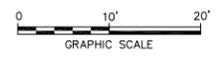
FIGURE
4

CITY: SYRACUSE, NY DIM/GROUP: ENV/CAD, DB: R. BASSETT, LD: (Opt) PIC: PM: TM: A. KORIK, LYN: ON: OFF: REF: G:\ENV\CAD\SYRACUSE\ACT\06261024\0001\00004\DWG\06261W06.dwg LAYOUT: 5_SAVED: 7/22/2013 9:45 PM ACADVER: 18.1S (LMS TECH) PAGES: 18.1S (LMS TECH) PLOTTABLE: PLT\FULL.CTB PLOTTED: 7/22/2013 9:46 PM BY: BASSETT, RICHARD XREFS: IMAGES: G5.jpg PROJECTNAME: --



- LEGEND:**
- MW-4 EXISTING MONITORING WELL
 - MPE-3 MPE EXTRACTION WELL
 - SS SANITARY SEWER LINE
 - MPE HEADER PIPE
 - UNDERGROUND STORAGE TANKS.
 - (81.79) GROUNDWATER ELEVATION (FT)
 - 76 GROUNDWATER ELEVATION CONTOUR (FT) (DASHED WHERE INFERRED)
 - APPROXIMATE DIRECTION OF GROUNDWATER FLOW

- NOTE:**
1. BASE MAP PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT AND PLEXUS SCIENTIFIC.
 2. ALL LOCATIONS AND SCALE ARE APPROXIMATE.
 3. * GROUNDWATER ELEVATION CONSIDERED ANOMALOUS AND WAS NOT USED IN CREATING CONTOUR.



U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT
AAFES STATION, FT. HAMILTON, N.Y.

GROUNDWATER ELEVATION MAP
JUNE 26, 2013



FIGURE
5

CITY: SYRACUSE, NY DIV/GROUP: ENV/CAD, DB: R. BASSSETT, LD: (Opt) PIC: TM: A. KORIK LYN: ON#="OFF"="REF"
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 PLOT: 7/23/2013 9:26 AM BY: BASSSETT, RICHARD
 XREFS: IMAGES: G5.jpg PROJECTNAME: --

MW-5		
	6/26/2013	LOC
Benzene	79	1
n-Butylbenzene	14	5
sec-Butylbenzene	6J	5
tert-Butylbenzene	< 2	5
Ethylbenzene	490	5
Isopropylbenzene	50	5
p-Isopropyltoluene	4J	5
Methyl Tertiary Butyl Ether	4J	
Naphthalene	180	10
n-Propylbenzene	84	5
Toluene	2,400	5
1,2,4-Trimethylbenzene	1,100	5
1,3,5-Trimethylbenzene	310	5
Xylene (Total)	5,400	5

MW-6		
	6/26/2013	LOC
Benzene	0.8J	1
n-Butylbenzene	< 1	5
sec-Butylbenzene	< 1	5
tert-Butylbenzene	< 1	5
Ethylbenzene	< 0.8	5
Isopropylbenzene	< 1	5
p-Isopropyltoluene	< 1	5
Methyl Tertiary Butyl Ether	< 0.5	
Naphthalene	< 1	10
n-Propylbenzene	< 1	5
Toluene	1J	5
1,2,4-Trimethylbenzene	< 1	5
1,3,5-Trimethylbenzene	< 1	5
Xylene (Total)	< 0.8	5

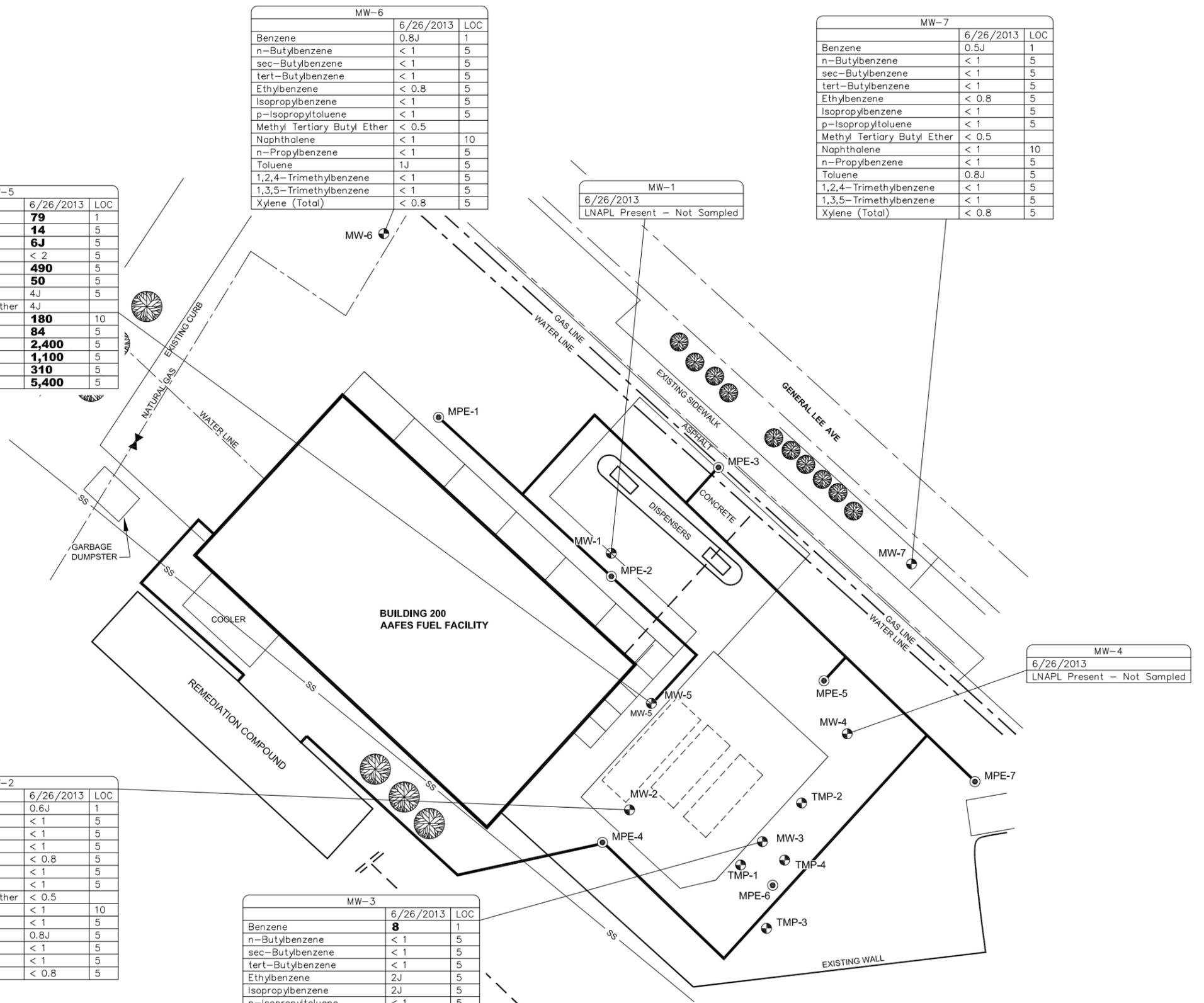
MW-7		
	6/26/2013	LOC
Benzene	0.5J	1
n-Butylbenzene	< 1	5
sec-Butylbenzene	< 1	5
tert-Butylbenzene	< 1	5
Ethylbenzene	< 0.8	5
Isopropylbenzene	< 1	5
p-Isopropyltoluene	< 1	5
Methyl Tertiary Butyl Ether	< 0.5	
Naphthalene	< 1	10
n-Propylbenzene	< 1	5
Toluene	0.8J	5
1,2,4-Trimethylbenzene	< 1	5
1,3,5-Trimethylbenzene	< 1	5
Xylene (Total)	< 0.8	5

MW-1		
	6/26/2013	LOC
	LNAPL Present - Not Sampled	

MW-4		
	6/26/2013	LOC
	LNAPL Present - Not Sampled	

MW-2		
	6/26/2013	LOC
Benzene	0.6J	1
n-Butylbenzene	< 1	5
sec-Butylbenzene	< 1	5
tert-Butylbenzene	< 1	5
Ethylbenzene	< 0.8	5
Isopropylbenzene	< 1	5
p-Isopropyltoluene	< 1	5
Methyl Tertiary Butyl Ether	< 0.5	
Naphthalene	< 1	10
n-Propylbenzene	< 1	5
Toluene	0.8J	5
1,2,4-Trimethylbenzene	< 1	5
1,3,5-Trimethylbenzene	< 1	5
Xylene (Total)	< 0.8	5

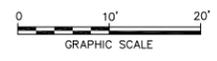
MW-3		
	6/26/2013	LOC
Benzene	8	1
n-Butylbenzene	< 1	5
sec-Butylbenzene	< 1	5
tert-Butylbenzene	< 1	5
Ethylbenzene	2J	5
Isopropylbenzene	2J	5
p-Isopropyltoluene	< 1	5
Methyl Tertiary Butyl Ether	19	
Naphthalene	1J	10
n-Propylbenzene	1J	5
Toluene	2J	5
1,2,4-Trimethylbenzene	7	5
1,3,5-Trimethylbenzene	7	5
Xylene (Total)	13	5



- LEGEND:**
- MW-4 (circle with dot) EXISTING MONITORING WELL
 - MPE-3 (circle with dot) MPE EXTRACTION WELL
 - SS (line) SANITARY SEWER LINE
 - (thick line) MPE HEADER PIPE
 - (dashed box) UNDERGROUND STORAGE TANKS.

TOGS 1.1.1 and 6 NYCRR Standards and Guidance Values	
Benzene	1
n-Butylbenzene	5
sec-Butylbenzene	5
tert-Butylbenzene	5
Ethylbenzene	5
Isopropylbenzene	5
p-Isopropyltoluene	5
Methyl Tertiary Butyl Ether	--
Naphthalene	10
n-Propylbenzene	5
Toluene	5
1,2,4-Trimethylbenzene	5
1,3,5-Trimethylbenzene	5
Xylene (Total)	5

- NOTE:**
1. BASE MAP PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT AND PLEXUS SCIENTIFIC.
 2. ALL LOCATIONS AND SCALE ARE APPROXIMATE. ALL VALUES ARE IN MICROGRAMS PER LITER (µg/L).
 3. BOLD ITEMS DENOTE EXCEEDANCES OF CLEAN UP STANDARDS.
 4. ALL ANALYTICAL METHOD DETECTION LIMITS ARE BELOW CLEAN UP STANDARD VALUES.
 5. J = ESTIMATED, N.D. = BELOW METHOD DETECTION LIMIT.



U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT
AAFES STATION, FT. HAMILTON, N.Y.

**GROUNDWATER CONCENTRATION MAP
JUNE 26, 2013**

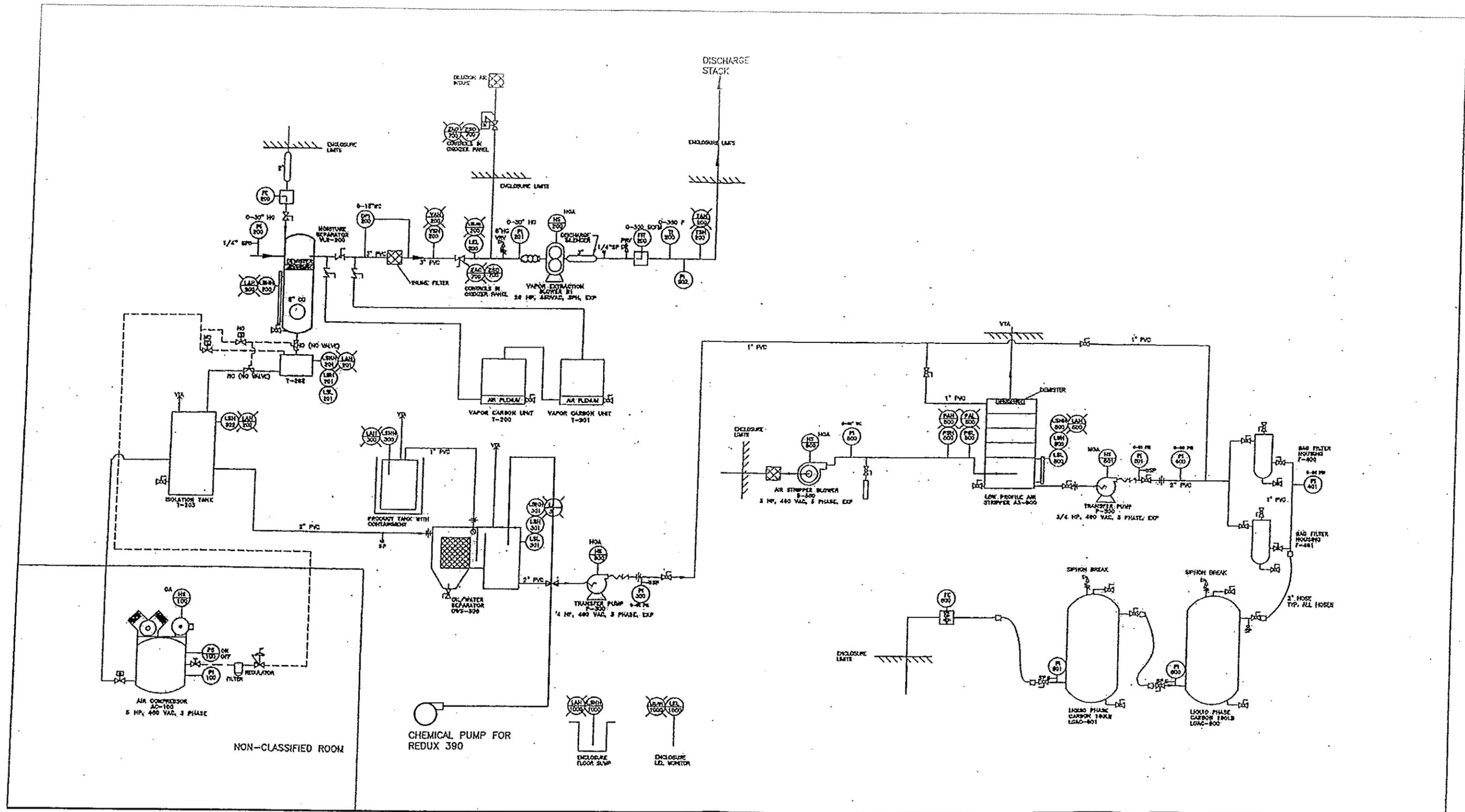


FIGURE
6

Appendix A
Piping and Instrumentation Diagram

File: N:\cad\CAD 18\USAEC\FT-Hamilton\Cw-Figures\MPEs-Flow-Dia-3.dwg
 Plot Date/Time: Ap 2011 - 2:52pm
 Plotted By: stephen.viafe

DRAWN BY: S. Viafe 08/02/10
 CHECKED BY: T. McHugh 08/02/10
 APPROVED BY: [Signature] [Signature]
 DRAWING NUMBER: MPEs-Flow-Diagram.dwg




Shaw Shaw Environmental, Inc.
 U.S. Army Corps of Engineers
 FIGURE No. A
P&ID SVE SYSTEM
 AAFES STATION, FT. HAMILTON, NEW YORK

Appendix B

LNAPL Mass Removal Calculations

16th Quarter System Operation

LNAPL MASS REMOVAL CALCULATIONS

System Information:	Carbon Adsorption
Operating minutes:	125,850 (est.)
Blower CFM:	250 cfm
Influent VOCs:	59.74 mg/m ³ = 59.74 ug/l

Conversions:

1 Cu. Ft. = 28.3168466 (L) Liters.

250 CFM = 7079.21165 (L/M) Calc: (250x28.3168466)

890,918,786 L Calc: (7079.21165L/M x 125,850 Minutes)

53,223,488,280 (micrograms) Calc: (59.74 ug/l x 890,918,786 L)

53,223,488,280 *micro grams removed in total*

53,223,488,280 micro grams = 117.3 pounds.

Gasoline weight = 5.93 to 6.42 pounds

117.3 / 5.92 = 19.8 gallons

117.3 / 6.42 = 18.3 gallons

Maximum Removal – 19.8 Gallons

Minimum Removal – 18.3 Gallons

Note: All air calculations are based on one air analysis collected during the quarterly time period. The LNAPL mass recovery is an estimate based on a summation of gas range organics (detected in EPA Method TO15).

Appendix C

Laboratory Analytical Data (Provided on CD)

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

ARCADIS
Suite 100
630 Plaza Drive
Highlands Ranch CO 80129

May 01, 2013

Project: Fort Hamilton

Site: Fort Hamilton, NY

Submittal Date: 04/18/2013

Group Number: 1384030

SDG: FTH11

PO Number: D12-0175

State of Sample Origin: NY

Client Sample Description

Effluent Grab Groundwater
Effluent Composite Groundwater
TB Water

Lancaster Labs (LLI) #

7027621
7027622
7027623

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC ARCADIS
COPY TO

Attn: Carla DaParma

Respectfully Submitted,



Katherine A. Klinefelter
Principal Specialist

(717) 556-7256

Project Name: Fort Hamilton
LLI Group #: 1384030

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 625, GC/MS Semivolatiles**

Batch #: 13109WAZ625 (Sample number(s): 7027622)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD exceeded the acceptance window indicating a positive bias: Naphthalene

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) LCSD

ASTM D93-90, Wet Chemistry

Sample #s: 7027621

No flash observed below 151F.

Test flame extinguished at 125F.

Flash point was determined using Pensky Martens closed cup apparatus.

Sample Description: Effluent Grab Groundwater
06261024.0001
Fort Hamilton, NY

LLI Sample # WW 7027621
LLI Group # 1384030
Account # 13129

Project Name: Fort Hamilton

Collected: 04/18/2013 13:45 by PB

ARCADIS

Suite 100

Submitted: 04/18/2013 19:10

630 Plaza Drive

Reported: 05/01/2013 10:16

Highlands Ranch CO 80129

FHME1 SDG#: FTH11-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles EPA 624			ug/l	ug/l	ug/l	
10371	Benzene	71-43-2	N.D.	0.9	5	1
10371	Ethylbenzene	100-41-4	N.D.	0.8	5	1
10371	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	5	1
10371	Tetrachloroethene	127-18-4	N.D.	1	5	1
10371	Toluene	108-88-3	N.D.	0.8	5	1
10371	Xylene (total)	1330-20-7	N.D.	0.9	5	1
Metals EPA 200.7 rev 4.4			mg/l	mg/l	mg/l	
07049	Cadmium	7440-43-9	N.D.	0.00036	0.0050	1
07053	Copper	7440-50-8	N.D.	0.0021	0.0100	1
07055	Lead	7439-92-1	N.D.	0.0051	0.0150	1
07061	Nickel	7440-02-0	0.0050 J	0.0011	0.0100	1
07072	Zinc	7440-66-6	0.0058 J	0.0020	0.0200	1
EPA 245.1 rev 3			mg/l	mg/l	mg/l	
00259	Mercury	7439-97-6	N.D.	0.000070	0.00020	1
Wet Chemistry SW-846 9056			mg/l	mg/l	mg/l	
10697	Chloride	16887-00-6	581	40.0	80.0	200
ASTM D93-90			Degrees F	Degrees F	Degrees F	
00430	Flash Point for Liquids	n.a.	No Flash Observed	50	50	1
No flash observed below 151F. Test flame extinguished at 125F. Flash point was determined using Pensky Martens closed cup apparatus.						
EPA 1664A			mg/l	mg/l	mg/l	
08079	HEM (oil & grease)	n.a.	3.1 J	1.4	5.0	1
SM 2540 B-1997			mg/l	mg/l	mg/l	
00203	Total Solids	n.a.	1,390	40.0	120	1
SM 2540 D-1997			mg/l	mg/l	mg/l	
00206	Total Suspended Solids	n.a.	N.D.	3.0	12.0	1
SM 3500-Cr B-2009			mg/l	mg/l	mg/l	
01446	Hexavalent Chromium	18540-29-9	N.D.	0.0010	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

Sample Description: Effluent Grab Groundwater
06261024.0001
Fort Hamilton, NY

LLI Sample # WW 7027621
LLI Group # 1384030
Account # 13129

Project Name: Fort Hamilton

Collected: 04/18/2013 13:45 by PB

ARCADIS

Suite 100

Submitted: 04/18/2013 19:10

630 Plaza Drive

Reported: 05/01/2013 10:16

Highlands Ranch CO 80129

FHME1 SDG#: FTH11-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10371	EPA 624 water	EPA 624	1	M131141AA	04/24/2013 10:34	Lauren C Temple	1
07049	Cadmium	EPA 200.7 rev 4.4	1	131145716002	04/30/2013 02:03	John W Yanzuk II	1
07053	Copper	EPA 200.7 rev 4.4	1	131145716002	04/30/2013 02:03	John W Yanzuk II	1
07055	Lead	EPA 200.7 rev 4.4	1	131145716002	04/30/2013 02:03	John W Yanzuk II	1
07061	Nickel	EPA 200.7 rev 4.4	1	131145716002	04/30/2013 02:03	John W Yanzuk II	1
07072	Zinc	EPA 200.7 rev 4.4	1	131145716002	04/30/2013 02:03	John W Yanzuk II	1
00259	Mercury	EPA 245.1 rev 3	3	131145714001	04/25/2013 07:44	Damary Valentin	1
05716	EPA 600 ICP Digest (tot rec)	EPA 200.7 rev 4.4	1	131145716002	04/25/2013 11:00	James L Mertz	1
05714	PW/WW Hg Digest	EPA 245.1 rev 3	1	131125714001	04/23/2013 16:40	Nelli S Markaryan	1
05714	PW/WW Hg Digest	EPA 245.1 rev 3	2	131145714001	04/24/2013 15:45	Nelli S Markaryan	1
10697	Chloride	SW-846 9056	1	13114655902A	04/24/2013 12:52	Christopher D Meeks	200
00430	Flash Point for Liquids	ASTM D93-90	1	13112043001A	04/22/2013 21:15	Hannah M Royer	1
08079	HEM (oil & grease)	EPA 1664A	1	13112807902A	04/22/2013 17:00	Michelle L Lalli	1
00203	Total Solids	SM 2540 B-1997	1	13109020301A	04/19/2013 08:21	Susan A Engle	1
00206	Total Suspended Solids	SM 2540 D-1997	1	13109020602A	04/19/2013 15:54	Clayton C Litchmore	1
01446	Hexavalent Chromium	SM 3500-Cr B-2009	1	13109144601A	04/19/2013 01:00	Daniel S Smith	1

*=This limit was used in the evaluation of the final result

Sample Description: Effluent Composite Groundwater
06261024.0001
Fort Hamilton, NY

LLI Sample # WW 7027622
LLI Group # 1384030
Account # 13129

Project Name: Fort Hamilton

Collected: 04/18/2013 13:30 by PB

ARCADIS

Suite 100

Submitted: 04/18/2013 19:10

630 Plaza Drive

Reported: 05/01/2013 10:16

Highlands Ranch CO 80129

FHME2 SDG#: FTH11-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles EPA 624			ug/l	ug/l	ug/l	
10371	Carbon Tetrachloride	56-23-5	N.D.	1	5	1
10371	Chloroform	67-66-3	N.D.	1	5	1
10371	1,4-Dichlorobenzene	106-46-7	N.D.	1	5	1
10371	1,1,1-Trichloroethane	71-55-6	N.D.	1	5	1
GC/MS Semivolatiles EPA 625			ug/l	ug/l	ug/l	
10334	Naphthalene	91-20-3	N.D.	0.2	5	1
10334	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.3	5	1
Pesticides/PCBs EPA 608			ug/l	ug/l	ug/l	
06030	PCB-1016	12674-11-2	N.D.	0.11	0.53	1
06030	PCB-1221	11104-28-2	N.D.	0.11	0.53	1
06030	PCB-1232	11141-16-5	N.D.	0.11	0.53	1
06030	PCB-1242	53469-21-9	N.D.	0.11	0.53	1
06030	PCB-1248	12672-29-6	N.D.	0.11	0.53	1
06030	PCB-1254	11097-69-1	N.D.	0.11	0.53	1
06030	PCB-1260	11096-82-5	N.D.	0.16	0.53	1
06030	Total PCBs	1336-36-3	N.D.	0.21	0.53	1
Metals EPA 200.7 rev 4.4			mg/l	mg/l	mg/l	
07049	Cadmium	7440-43-9	N.D.	0.00036	0.0050	1
Wet Chemistry EPA 351.2			mg/l	mg/l	mg/l	
00217	Kjeldahl Nitrogen	n.a.	N.D.	0.50	1.0	1
EPA 353.2			mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	7727-37-9	0.18	0.040	0.10	1
EPA 420.4			mg/l	mg/l	mg/l	
00434	Phenols (water)	n.a.	N.D.	0.015	0.040	1
SM 4500 N-1999			mg/l	mg/l	mg/l	
06165	Total NO2/NO3/TKN	n.a.	N.D.	0.50	1.0	1
SM 5210 B-2001			mg/l	mg/l	mg/l	
01364	Carbonaceous BOD	n.a.	N.D.	4.5	4.5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

Sample Description: Effluent Composite Groundwater
06261024.0001
Fort Hamilton, NY

LLI Sample # WW 7027622
LLI Group # 1384030
Account # 13129

Project Name: Fort Hamilton

Collected: 04/18/2013 13:30 by PB

ARCADIS

Suite 100

Submitted: 04/18/2013 19:10

630 Plaza Drive

Reported: 05/01/2013 10:16

Highlands Ranch CO 80129

FHME2 SDG#: FTH11-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10371	EPA 624 water	EPA 624	1	M131141AA	04/24/2013 10:59	Lauren C Temple	1
10334	Method 625	EPA 625	1	13109WAZ625	04/23/2013 01:36	Chad A Moline	1
08108	625 Water Extraction	EPA 625	1	13109WAZ625	04/20/2013 12:15	Olivia Arosemena	1
06030	PCBs in Water	EPA 608	1	131100009A	04/23/2013 18:44	Monica M Souders	1
11960	Method 608 PCB Water Ext.	EPA 608	1	131100009A	04/22/2013 10:10	Denise L Trimby	1
07049	Cadmium	EPA 200.7 rev 4.4	1	131145716002	04/30/2013 01:42	John W Yanzuk II	1
05716	EPA 600 ICP Digest (tot rec)	EPA 200.7 rev 4.4	1	131145716002	04/25/2013 11:00	James L Mertz	1
00217	Kjeldahl Nitrogen	EPA 351.2	1	13109108101B	04/23/2013 15:12	Joseph E McKenzie	1
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	13109118102A	04/19/2013 16:53	Joseph E McKenzie	1
00434	Phenols (water)	EPA 420.4	1	13112113101A	04/24/2013 12:28	K Robert Caulfeild-James	1
06165	Total NO2/NO3/TKN	SM 4500 N-1999	1	13109108101B	04/23/2013 15:12	Joseph E McKenzie	1
01460	Total Kjeldahl Nitrogen Digest	EPA 351.2	1	13109108101B	04/19/2013 16:00	Carolyn M Mastropietro	1
00491	Phenol Distillation (water)	EPA 420.4	1	13112113101A	04/22/2013 15:40	Carolyn M Mastropietro	1
01364	Carbonaceous BOD	SM 5210 B-2001	1	13109023501A	04/19/2013 06:59	Susan E Hibner	1

*=This limit was used in the evaluation of the final result

Sample Description: TB Water
06261024.0001
Fort Hamilton, NY

LLI Sample # WW 7027623
LLI Group # 1384030
Account # 13129

Project Name: Fort Hamilton

Collected: 04/18/2013

ARCADIS

Submitted: 04/18/2013 19:10

Suite 100

Reported: 05/01/2013 10:16

630 Plaza Drive

Highlands Ranch CO 80129

FHMTB SDG#: FTH11-03TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	EPA 624	ug/l	ug/l	ug/l	
10371	Benzene	71-43-2	N.D.	0.9	5	1
10371	Carbon Tetrachloride	56-23-5	N.D.	1	5	1
10371	Chloroform	67-66-3	N.D.	1	5	1
10371	1,4-Dichlorobenzene	106-46-7	N.D.	1	5	1
10371	Ethylbenzene	100-41-4	N.D.	0.8	5	1
10371	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	5	1
10371	Tetrachloroethene	127-18-4	N.D.	1	5	1
10371	Toluene	108-88-3	N.D.	0.8	5	1
10371	1,1,1-Trichloroethane	71-55-6	N.D.	1	5	1
10371	Xylene (total)	1330-20-7	N.D.	0.9	5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10371	EPA 624 water	EPA 624	1	M131141AA	04/24/2013 10:08	Lauren C Temple	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: ARCADIS

Group Number: 1384030

Reported: 05/01/13 at 10:16 AM

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL**</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: M131141AA Sample number(s): 7027621-7027623									
Benzene	N.D.	0.9	5	ug/l	96	95	80-120	1	30
Carbon Tetrachloride	N.D.	1.	5	ug/l	88	90	65-140	2	30
Chloroform	N.D.	1.	5	ug/l	94	96	65-135	2	30
1,4-Dichlorobenzene	N.D.	1.	5	ug/l	101	99	75-125	2	30
Ethylbenzene	N.D.	0.8	5	ug/l	95	96	75-125	1	30
Methyl Tertiary Butyl Ether	N.D.	1.	5	ug/l	79	82	65-125	4	30
Tetrachloroethene	N.D.	1.	5	ug/l	109	108	45-150	0	30
Toluene	N.D.	0.8	5	ug/l	96	95	75-120	2	30
1,1,1-Trichloroethane	N.D.	1.	5	ug/l	85	87	65-130	2	30
Xylene (total)	N.D.	0.9	5	ug/l	97	98	80-120	1	30
Batch number: 13109WAZ625 Sample number(s): 7027622									
Naphthalene	N.D.	0.2	5	ug/l	101*	114*	40-100	12	30
1,2,4-Trichlorobenzene	N.D.	0.3	5	ug/l	86	85	35-105	2	30
Batch number: 131100009A Sample number(s): 7027622									
PCB-1016	N.D.	0.10	0.50	ug/l	95	94	25-145	1	30
PCB-1221	N.D.	0.10	0.50	ug/l					
PCB-1232	N.D.	0.10	0.50	ug/l					
PCB-1242	N.D.	0.10	0.50	ug/l					
PCB-1248	N.D.	0.10	0.50	ug/l					
PCB-1254	N.D.	0.10	0.50	ug/l					
PCB-1260	N.D.	0.15	0.50	ug/l	100	98	30-145	2	30
Total PCBs	N.D.	0.20	0.50	ug/l					
Batch number: 131145714001 Sample number(s): 7027621									
Mercury	N.D.	0.00007	0.00020	mg/l	94		80-120		
		0							
Batch number: 131145716002 Sample number(s): 7027621-7027622									
Cadmium	N.D.	0.00036	0.0050	mg/l	102		80-120		
Copper	N.D.	0.0021	0.0100	mg/l	104		80-120		
Lead	N.D.	0.0051	0.0150	mg/l	104		80-120		
Nickel	N.D.	0.0011	0.0100	mg/l	105		80-120		
Zinc	N.D.	0.0020	0.0200	mg/l	106		80-120		
Batch number: 13109108101B Sample number(s): 7027622									
Kjeldahl Nitrogen	N.D.	0.50	1.0	mg/l	90		90-110		
Batch number: 13109118102A Sample number(s): 7027622									
Total Nitrite/Nitrate Nitrogen	N.D.	0.040	0.10	mg/l	97		90-110		
Batch number: 13112113101A Sample number(s): 7027622									

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: ARCADIS

Group Number: 1384030

Reported: 05/01/13 at 10:16 AM

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL**</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCS D %REC</u>	<u>LCS/LCS D Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Phenols (water)	N.D.	0.015	0.040	mg/l	99		90-110		
Batch number: 13114655902A Chloride	Sample number(s): 7027621 N.D. 0.20 0.40			mg/l	95		80-120		
Batch number: 13109020301A Total Solids	Sample number(s): 7027621 N.D. 10.0 30.0			mg/l	100		90-114		
Batch number: 13109020602A Total Suspended Solids	Sample number(s): 7027621 3.2 J 3.0 12.0			mg/l	94		79-107		
Batch number: 13109023501A Carbonaceous BOD	Sample number(s): 7027622				85		82-112		
Batch number: 13109144601A Hexavalent Chromium	Sample number(s): 7027621 N.D. 0.0010 0.0050			mg/l	100	103	95-105	2	20
Batch number: 13112043001A Flash Point for Liquids	Sample number(s): 7027621				102	99	97-103	2	4
Batch number: 13112807902A HEM (oil & grease)	Sample number(s): 7027621 1.6 J 1.4 5.0			mg/l	87	92	78-114	5	16

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 131145714001 Mercury	Sample number(s): 7027621 UNSPK: 7027621					BKG: 7027621			
	99		80-120			N.D.	N.D.	0 (1)	20
Batch number: 131145716002 Cadmium	Sample number(s): 7027621-7027622 UNSPK: 7027622					BKG: 7027622			
	99		80-120			N.D.	N.D.	0 (1)	20
Copper	105		80-120			N.D.	N.D.	0 (1)	20
Lead	102		80-120			N.D.	N.D.	0 (1)	20
Nickel	102		80-120			0.0043 J	0.0044 J	2 (1)	20
Zinc	105		80-120			0.0518	0.0526	2 (1)	20
Batch number: 13109108101B Kjeldahl Nitrogen	Sample number(s): 7027622 UNSPK: P026815					BKG: P026815			
	91		90-110			0.89 J	1.1	17 (1)	20
Batch number: 13109118102A Total Nitrite/Nitrate Nitrogen	Sample number(s): 7027622 UNSPK: P027329					BKG: P027329			
	95		90-110			0.66	0.65	1	2
Batch number: 13112113101A Phenols (water)	Sample number(s): 7027622 UNSPK: P028238								
	96	99	90-110	3	6				
Batch number: 13114655902A Chloride	Sample number(s): 7027621 UNSPK: 7027621					BKG: 7027621			
	92	92	80-120	0	15	581	584	0	10
Batch number: 13109020301A	Sample number(s): 7027621 UNSPK: P023730					BKG: P023730			

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: ARCADIS

Group Number: 1384030

Reported: 05/01/13 at 10:16 AM

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup</u> <u>RPD</u> <u>Max</u>
Total Solids	92		76-124			2,430	2,420	0	8
Batch number: 13109020602A	Sample number(s): 7027621 BKG: P027158								
Total Suspended Solids						165	168	2	20
Batch number: 13109023501A	Sample number(s): 7027622 UNSPK: P026815 BKG: P026814								
Carbonaceous BOD	100	102	69-139	2	8	302	291	4	15
Batch number: 13109144601A	Sample number(s): 7027621 BKG: 7027621								
Hexavalent Chromium						N.D.	N.D.	0 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: EPA 624 water

Batch number: M131141AA

	1,2-Dichloroethane-d4	Fluorobenzene	4-Bromofluorobenzene
7027621	93	98	87
7027622	95	98	86
7027623	96	100	87
Blank	95	101	93
LCS	94	103	98
LCSD	95	101	99

Limits: 70-120 80-120 75-120

Analysis Name: Method 625

Batch number: 13109WAZ625

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
7027622	89	103	90
Blank	98	100	115
LCS	102	108	107
LCSD	111*	101	106

Limits: 40-110 50-110 50-135

Analysis Name: PCBs in Water

Batch number: 131100009A

	Tetrachloro-m-xylene	Decachlorobiphenyl
7027622	100	105
Blank	96	109
LCS	105	107
LCSD	99	88

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: ARCADIS
Reported: 05/01/13 at 10:16 AM

Group Number: 1384030

Surrogate Quality Control

Limits: 58-140 40-135

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody



Lancaster Laboratories

Acct. # 13129

For Eurofins Lancaster Laboratories use only
 Group # 1384030 Sample # 7027621-23
Instructions on reverse side correspond with circled numbers.

COC # 325795

1 Client Information				4 Matrix			5 Analysis Requested										For Lab Use Only					
Client: <u>ARCANIS - US</u>		Acct. #:		Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Ground <input checked="" type="checkbox"/> Water <input type="checkbox"/> NPDES <input type="checkbox"/> Surface <input type="checkbox"/> Other: <u>Di H₂O</u>	Soil <input type="checkbox"/> Water <input type="checkbox"/> Other:	Total # of Containers	Preservation Codes										FSC: _____	SCR#: _____				
Project Name/ #: <u>FORT HAMILTON</u>		PWSID #:					Preservation Codes										H=HCl T=Thiosulfate N=HNO ₃ B=NaOH S=H ₂ SO ₄ O=Other					
Project Manager: <u>BRIAN STEMPKOWSKI</u>		P.O. #:					H N H N S S FLASH POINT, HEXAVALENT CHROMIUM, TSS, TSS, HEM (OTG) VIA 1664, CADMIUM, COPPER, LEAD, MERCURY, NICKEL, ZINC, VOC'S (VIA 624), CHLORIDE, CADMIUM, PHENOL'S, KJEDAHN NITROGEN, TOTAL NITRITE/NITRATE NITROGEN, C-BOD, 5-VOC'S, PCB'S, 608 (VIA 624), PESTICIDES										6 Remarks					
Sampler: <u>PAUL BOYKO</u>		Quote #: <u>06261024-0001</u>																				
Name of state where samples were collected: <u>NEW YORK</u>																						
2 Sample Identification		3 Collected		Grab <input type="checkbox"/>	Composite <input type="checkbox"/>																	
		Date	Time																			
EFFLUENT		4-18-13	13:45	X		X	9	X	X	X	X	X	X	X	X	X	X	X	X			
EFFLUENT - COMP. T-B.		↓	13:30	X		X	9							X	X	X	X	X	X			
							2															

7 Turnaround Time (TAT) Requested (please circle)				Relinquished by <u>PAUL BOYKO</u>		Date <u>4-18-13</u>	Time <u>14:35</u>	Received by <u>H WASHINGTON</u>	Date <u>4/18/13</u>	Time <u>16:48</u>	9
(Standard) <input checked="" type="radio"/> Rush <input type="radio"/> (Rush TAT is subject to Lancaster Laboratories approval and surcharge.)				Relinquished by <u>H WASHINGTON</u>		Date <u>4/18/13</u>	Time <u>19:10</u>	Received by	Date	Time	
Date results are needed: _____				Relinquished by		Date	Time	Received by	Date	Time	
E-mail address: _____				Relinquished by		Date	Time	Received by	Date	Time	
8 Data Package Options (circle if required)				Relinquished by		Date	Time	Received by <u>[Signature]</u>	Date <u>4/18/13</u>	Time <u>19:10</u>	
Type I (Validation/non-CLP)	Type VI (Raw Data Only)			Relinquished by Commercial Carrier:				UPS _____ FedEx _____ Other _____			
Type III (Reduced non-CLP)	TX TRRP-13			Site-Specific QC (MS/MSD/Dup)? Yes No				Temperature upon receipt <u>1.6</u> °C			
Type IV (CLP SOW)	MA MCP CT RCP			If yes, format: _____							
				Site-Specific QC (MS/MSD/Dup)? Yes No							
				(If yes, indicate QC sample and submit triplicate sample volume.)							

Environmental Sample Administration
Receipt Documentation Log

1384030

Client/Project: Arcadis
Date of Receipt: 4/18/13
Time of Receipt: 1910
Source Code: 01

Shipping Container Sealed: YES NO

Custody Seal Present *: YES NO

* Custody seal was intact unless otherwise noted in the discrepancy section

Package: Chilled Not Chilled

Temperature of Shipping Containers							
Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1	DT121	1.6	TB	WI	Y	B	
2							
3							
4							
5							
6							

0

Number of Trip Blanks received NOT listed on chain of custody: _____

Paperwork Discrepancy/Unpacking Problems:

Unpacker Signature/Emp#: [Signature] 2308 Date/Time: 4/18/13 1920

Issued by Dept. 6042 Management

2174.06

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m3	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
J	estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers	Inorganic Qualifiers
A TIC is a possible aldol-condensation product	B Value is $<$ CRDL, but \geq IDL
B Analyte was also detected in the blank	E Estimated due to interference
C Pesticide result confirmed by GC/MS	M Duplicate injection precision not met
D Compound quantitated on a diluted sample	N Spike sample not within control limits
E Concentration exceeds the calibration range of the instrument	S Method of standard additions (MSA) used for calculation
N Presumptive evidence of a compound (TICs only)	U Compound was not detected
P Concentration difference between primary and confirmation columns $>$ 25%	W Post digestion spike out of control limits
U Compound was not detected	* Duplicate analysis not within control limits
X,Y,Z Defined in case narrative	+ Correlation coefficient for MSA $<$ 0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

ARCADIS
Suite 100
630 Plaza Drive
Highlands Ranch CO 80129

July 10, 2013

Project: Fort Hamilton

Site: Fort Hamilton, NY

Submittal Date: 06/26/2013

Group Number: 1400044

SDG: FTH12

PO Number: D12-0175

State of Sample Origin: NY

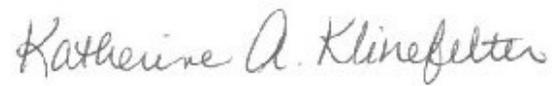
<u>Client Sample Description</u>	<u>Lancaster Labs (LL) #</u>
MW-2 Grab Groundwater	7108557
MW-3 Grab Groundwater	7108558
MW-5 Grab Groundwater	7108559
MW-6 Grab Groundwater	7108560
MW-7 Grab Groundwater	7108561
TB Water	7108562

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC ARCADIS
COPY TO

Attn: Carla DaParma

Respectfully Submitted,



Katherine A. Klinefelter
Principal Specialist

(717) 556-7256

Project Name: Fort Hamilton
LLI Group #: 1400044

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

Sample Description: MW-2 Grab Groundwater
06261024.0001.00003
Fort Hamilton, NY

LL Sample # WW 7108557
LL Group # 1400044
Account # 13129

Project Name: Fort Hamilton

Collected: 06/26/2013 12:48 by PB

ARCADIS

Suite 100

Submitted: 06/26/2013 18:45

630 Plaza Drive

Reported: 07/10/2013 16:23

Highlands Ranch CO 80129

HAM02 SDG#: FTH12-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	0.6 J	0.5	5	1
10335	n-Butylbenzene	104-51-8	N.D.	1	5	1
10335	sec-Butylbenzene	135-98-8	N.D.	1	5	1
10335	tert-Butylbenzene	98-06-6	N.D.	1	5	1
10335	Ethylbenzene	100-41-4	N.D.	0.8	5	1
10335	Isopropylbenzene	98-82-8	N.D.	1	5	1
10335	p-Isopropyltoluene	99-87-6	N.D.	1	5	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	5	1
10335	Naphthalene	91-20-3	N.D.	1	5	1
10335	n-Propylbenzene	103-65-1	N.D.	1	5	1
10335	Toluene	108-88-3	0.8 J	0.7	5	1
10335	1,2,4-Trimethylbenzene	95-63-6	N.D.	1	5	1
10335	1,3,5-Trimethylbenzene	108-67-8	N.D.	1	5	1
10335	Xylene (Total)	1330-20-7	N.D.	0.8	5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 21:56	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y131893AA	07/08/2013 21:56	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3 Grab Groundwater
06261024.0001.00003
Fort Hamilton, NY

LL Sample # WW 7108558
LL Group # 1400044
Account # 13129

Project Name: Fort Hamilton

Collected: 06/26/2013 11:39 by PB

ARCADIS

Suite 100

Submitted: 06/26/2013 18:45

630 Plaza Drive

Reported: 07/10/2013 16:23

Highlands Ranch CO 80129

HAM03 SDG#: FTH12-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	8	0.5	5	1
10335	n-Butylbenzene	104-51-8	N.D.	1	5	1
10335	sec-Butylbenzene	135-98-8	N.D.	1	5	1
10335	tert-Butylbenzene	98-06-6	N.D.	1	5	1
10335	Ethylbenzene	100-41-4	2 J	0.8	5	1
10335	Isopropylbenzene	98-82-8	2 J	1	5	1
10335	p-Isopropyltoluene	99-87-6	N.D.	1	5	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	19	0.5	5	1
10335	Naphthalene	91-20-3	1 J	1	5	1
10335	n-Propylbenzene	103-65-1	1 J	1	5	1
10335	Toluene	108-88-3	2 J	0.7	5	1
10335	1,2,4-Trimethylbenzene	95-63-6	7	1	5	1
10335	1,3,5-Trimethylbenzene	108-67-8	7	1	5	1
10335	Xylene (Total)	1330-20-7	13	0.8	5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 22:17	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y131893AA	07/08/2013 22:17	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-5 Grab Groundwater
06261024.0001.00003
Fort Hamilton, NY

LL Sample # WW 7108559
LL Group # 1400044
Account # 13129

Project Name: Fort Hamilton

Collected: 06/26/2013 13:53 by PB

ARCADIS

Submitted: 06/26/2013 18:45

Suite 100

Reported: 07/10/2013 16:23

630 Plaza Drive

Highlands Ranch CO 80129

HAM05 SDG#: FTH12-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	79	1	10	2
10335	n-Butylbenzene	104-51-8	14	2	10	2
10335	sec-Butylbenzene	135-98-8	6 J	2	10	2
10335	tert-Butylbenzene	98-06-6	N.D.	2	10	2
10335	Ethylbenzene	100-41-4	490	2	10	2
10335	Isopropylbenzene	98-82-8	50	2	10	2
10335	p-Isopropyltoluene	99-87-6	4 J	2	10	2
10335	Methyl Tertiary Butyl Ether	1634-04-4	4 J	1	10	2
10335	Naphthalene	91-20-3	180	2	10	2
10335	n-Propylbenzene	103-65-1	84	2	10	2
10335	Toluene	108-88-3	2,400	14	100	20
10335	1,2,4-Trimethylbenzene	95-63-6	1,100	20	100	20
10335	1,3,5-Trimethylbenzene	108-67-8	310	2	10	2
10335	Xylene (Total)	1330-20-7	5,400	16	100	20

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 22:38	Kevin A Sposito	2
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 22:59	Kevin A Sposito	20
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y131893AA	07/08/2013 22:38	Kevin A Sposito	2
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Y131893AA	07/08/2013 22:59	Kevin A Sposito	20

*=This limit was used in the evaluation of the final result

Sample Description: MW-6 Grab Groundwater
06261024.0001.00003
Fort Hamilton, NY

LL Sample # WW 7108560
LL Group # 1400044
Account # 13129

Project Name: Fort Hamilton

Collected: 06/26/2013 09:20 by PB

ARCADIS

Suite 100

Submitted: 06/26/2013 18:45

630 Plaza Drive

Reported: 07/10/2013 16:23

Highlands Ranch CO 80129

HAM06 SDG#: FTH12-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	0.8 J	0.5	5	1
10335	n-Butylbenzene	104-51-8	N.D.	1	5	1
10335	sec-Butylbenzene	135-98-8	N.D.	1	5	1
10335	tert-Butylbenzene	98-06-6	N.D.	1	5	1
10335	Ethylbenzene	100-41-4	N.D.	0.8	5	1
10335	Isopropylbenzene	98-82-8	N.D.	1	5	1
10335	p-Isopropyltoluene	99-87-6	N.D.	1	5	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	5	1
10335	Naphthalene	91-20-3	N.D.	1	5	1
10335	n-Propylbenzene	103-65-1	N.D.	1	5	1
10335	Toluene	108-88-3	1 J	0.7	5	1
10335	1,2,4-Trimethylbenzene	95-63-6	N.D.	1	5	1
10335	1,3,5-Trimethylbenzene	108-67-8	N.D.	1	5	1
10335	Xylene (Total)	1330-20-7	N.D.	0.8	5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 23:20	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y131893AA	07/08/2013 23:20	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-7 Grab Groundwater
06261024.0001.00003
Fort Hamilton, NY

LL Sample # WW 7108561
LL Group # 1400044
Account # 13129

Project Name: Fort Hamilton

Collected: 06/26/2013 10:28 by PB

ARCADIS

Suite 100

Submitted: 06/26/2013 18:45

630 Plaza Drive

Reported: 07/10/2013 16:23

Highlands Ranch CO 80129

HAM07 SDG#: FTH12-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	0.5 J	0.5	5	1
10335	n-Butylbenzene	104-51-8	N.D.	1	5	1
10335	sec-Butylbenzene	135-98-8	N.D.	1	5	1
10335	tert-Butylbenzene	98-06-6	N.D.	1	5	1
10335	Ethylbenzene	100-41-4	N.D.	0.8	5	1
10335	Isopropylbenzene	98-82-8	N.D.	1	5	1
10335	p-Isopropyltoluene	99-87-6	N.D.	1	5	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	5	1
10335	Naphthalene	91-20-3	N.D.	1	5	1
10335	n-Propylbenzene	103-65-1	N.D.	1	5	1
10335	Toluene	108-88-3	0.8 J	0.7	5	1
10335	1,2,4-Trimethylbenzene	95-63-6	N.D.	1	5	1
10335	1,3,5-Trimethylbenzene	108-67-8	N.D.	1	5	1
10335	Xylene (Total)	1330-20-7	N.D.	0.8	5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 23:41	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y131893AA	07/08/2013 23:41	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: TB Water
06261024.0001.00003
Fort Hamilton, NY

LL Sample # WW 7108562
LL Group # 1400044
Account # 13129

Project Name: Fort Hamilton

Collected: 06/26/2013

ARCADIS

Submitted: 06/26/2013 18:45

Suite 100

Reported: 07/10/2013 16:23

630 Plaza Drive

Highlands Ranch CO 80129

HAMTB SDG#: FTH12-06TB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	N.D.	0.5	5	1
10335	n-Butylbenzene	104-51-8	N.D.	1	5	1
10335	sec-Butylbenzene	135-98-8	N.D.	1	5	1
10335	tert-Butylbenzene	98-06-6	N.D.	1	5	1
10335	Ethylbenzene	100-41-4	N.D.	0.8	5	1
10335	Isopropylbenzene	98-82-8	N.D.	1	5	1
10335	p-Isopropyltoluene	99-87-6	N.D.	1	5	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	5	1
10335	Naphthalene	91-20-3	N.D.	1	5	1
10335	n-Propylbenzene	103-65-1	N.D.	1	5	1
10335	Toluene	108-88-3	N.D.	0.7	5	1
10335	1,2,4-Trimethylbenzene	95-63-6	N.D.	1	5	1
10335	1,3,5-Trimethylbenzene	108-67-8	N.D.	1	5	1
10335	Xylene (Total)	1330-20-7	N.D.	0.8	5	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	8260 Ext. Water Master w/GRO	SW-846 8260B	1	Y131893AA	07/08/2013 21:34	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Y131893AA	07/08/2013 21:34	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: ARCADIS

Group Number: 1400044

Reported: 07/10/13 at 04:23 PM

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL**</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: Y131893AA Sample number(s): 7108557-7108562									
Benzene	N.D.	0.5	5	ug/l	98	96	80-120	1	30
n-Butylbenzene	N.D.	1.	5	ug/l	97	95	70-135	1	30
sec-Butylbenzene	N.D.	1.	5	ug/l	101	100	70-125	1	30
tert-Butylbenzene	N.D.	1.	5	ug/l	95	94	70-130	1	30
Ethylbenzene	N.D.	0.8	5	ug/l	97	97	75-125	0	30
Isopropylbenzene	N.D.	1.	5	ug/l	100	100	75-125	0	30
p-Isopropyltoluene	N.D.	1.	5	ug/l	100	99	75-130	1	30
Methyl Tertiary Butyl Ether	N.D.	0.5	5	ug/l	101	101	65-125	0	30
Naphthalene	N.D.	1.	5	ug/l	84	82	55-140	2	30
n-Propylbenzene	N.D.	1.	5	ug/l	101	100	70-130	1	30
Toluene	N.D.	0.7	5	ug/l	101	100	75-120	1	30
1,2,4-Trimethylbenzene	N.D.	1.	5	ug/l	99	100	75-130	1	30
1,3,5-Trimethylbenzene	N.D.	1.	5	ug/l	100	99	75-130	1	30
Xylene (Total)	N.D.	0.8	5	ug/l	98	98	80-120	0	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260 Ext. Water Master w/GRO

Batch number: Y131893AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
7108557	92	94	91	87
7108558	93	93	90	89
7108559	90	91	89	91
7108560	88	91	92	87
7108561	89	92	92	87
7108562	91	91	90	85
Blank	92	91	91	85
LCS	92	94	93	91
LCSD	92	93	93	91
Limits:	85-115	70-120	85-120	75-120

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: ARCADIS
Reported: 07/10/13 at 04:23 PM

Group Number: 1400044

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Environmental Sample Administration
Receipt Documentation Log

1400044

Client/Project: Armadis

Shipping Container Sealed: YES NO

Date of Receipt: 6/26/13

Custody Seal Present * : YES NO

Time of Receipt: 1845

* Custody seal was intact unless otherwise noted in the discrepancy section

Source Code: 01

Package: Chilled Not Chilled

Temperature of Shipping Containers

Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1	OT131	0.6	TB	WI	y	B	
2							
3							
4							
5							
6							

Number of Trip Blanks received NOT listed on chain of custody: 0

Paperwork Discrepancy/Unpacking Problems:

Unpacker Signature/Emp#: Pat G 3472 Date/Time: 6/26/13 1858

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m3	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

Inorganic Qualifiers

A	TIC is a possible aldol-condensation product	B	Value is $<$ CRDL, but \geq IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns $>$ 25%	W	Post digestion spike out of control limits
U	Compound was not detected	*	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	+	Correlation coefficient for MSA $<$ 0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

ARCADIS
Suite 100
630 Plaza Drive
Highlands Ranch CO 80129

July 10, 2013

Project: Fort Hamilton

Site: Fort Hamilton, NY

Submittal Date: 06/28/2013

Group Number: 1400691

SDG: FTH13

PO Number: D12-0175

State of Sample Origin: NY

Client Sample Description

MPE INFLUENT-BD Grab Air
MPE EFFLUENT Grab Air
Air Stripper EFFLUENT Grab Air

Lancaster Labs (LL) #

7112221
7112222
7112223

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO

ARCADIS

Attn: Carla DaParma

Respectfully Submitted,



Katherine A. Klinefelter
Principal Specialist

(717) 556-7256

Project Name: Fort Hamilton
LLI Group #: 1400691

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA TO-15, Volatiles in Air**

Sample #s: 7112221, 7112222, 7112223

The sample was collected in a Tedlar bag which is not the container referenced in the EPA method.

Sample Description: MPE INFLUENT-BD Grab Air
06261024.0001.00002
Fort Hamilton, NY

LL Sample # AQ 7112221
LL Group # 1400691
Account # 13129

Project Name: Fort Hamilton

Collected: 06/28/2013 11:15 by PB

ARCADIS

Suite 100

Submitted: 06/28/2013 19:24

630 Plaza Drive

Reported: 07/10/2013 19:13

Highlands Ranch CO 80129

MPEIN SDG#: FTH13-01

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
Volatiles in Air		EPA TO-15	ppm(v)	ppm(v)	mg/m3	mg/m3	
05265	Acetone	67-64-1	0.78	0.050	1.9	0.12	100
05265	Benzene	71-43-2	0.027 J	0.020	0.088 J	0.064	100
05265	1,3-Butadiene	106-99-0	N.D.	0.040	N.D.	0.088	100
05265	2-Butanone	78-93-3	N.D.	0.050	N.D.	0.15	100
05265	Cumene	98-82-8	N.D.	0.020	N.D.	0.098	100
05265	1,2-Dichloropropane	78-87-5	N.D.	0.020	N.D.	0.092	100
05265	Ethylbenzene	100-41-4	0.068 J	0.020	0.30 J	0.087	100
05265	4-Ethyltoluene	622-96-8	0.028 J	0.020	0.14 J	0.098	100
05265	Heptane	142-82-5	0.20	0.020	0.82	0.082	100
05265	Hexane	110-54-3	1.3	0.020	4.7	0.070	100
05265	2-Hexanone	591-78-6	N.D.	0.050	N.D.	0.20	100
05265	Isooctane	540-84-1	6.3	0.020	29	0.093	100
05265	Methyl t-Butyl Ether	1634-04-4	N.D.	0.020	N.D.	0.072	100
05265	Naphthalene	91-20-3	N.D.	0.040	N.D.	0.21	100
05265	Octane	111-65-9	0.055 J	0.020	0.26 J	0.093	100
05265	Pentane	109-66-0	6.3	0.20	19	0.59	1000
05265	Toluene	108-88-3	0.39	0.020	1.5	0.075	100
05265	1,2,4-Trimethylbenzene	95-63-6	0.073 J	0.020	0.36 J	0.098	100
05265	1,3,5-Trimethylbenzene	108-67-8	0.034 J	0.020	0.17 J	0.098	100
05265	m/p-Xylene	179601-23-1	0.25	0.020	1.1	0.087	100
05265	o-Xylene	95-47-6	0.091 J	0.020	0.40 J	0.087	100

The sample was collected in a Tedlar bag which is not the container referenced in the EPA method.

MDL = Method Detection Limit

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05265	TO-15 VOA Ext. List Tedlar	EPA TO-15	1	D1318530AA	07/05/2013 03:17	Michael A Ziegler	100
05265	TO-15 VOA Ext. List Tedlar	EPA TO-15	1	D1318630AA	07/05/2013 19:53	Jeffrey B Smith	1000

Sample Description: MPE EFFLUENT Grab Air
06261024.0001.00002
Fort Hamilton, NY

LL Sample # AQ 7112222
LL Group # 1400691
Account # 13129

Project Name: Fort Hamilton

Collected: 06/28/2013 11:10 by PB

ARCADIS

Suite 100

Submitted: 06/28/2013 19:24

630 Plaza Drive

Reported: 07/10/2013 19:13

Highlands Ranch CO 80129

MPEEF SDG#: FTH13-02

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
Volatiles in Air		EPA TO-15	ppm(v)	ppm(v)	mg/m3	mg/m3	
05265	Acetone	67-64-1	N.D.	0.00050	N.D.	0.0012	1
05265	Benzene	71-43-2	0.0015	0.00020	0.0048	0.00064	1
05265	1,3-Butadiene	106-99-0	N.D.	0.00040	N.D.	0.00088	1
05265	2-Butanone	78-93-3	0.00086 J	0.00050	0.0025 J	0.0015	1
05265	Cumene	98-82-8	N.D.	0.00020	N.D.	0.00098	1
05265	1,2-Dichloropropane	78-87-5	N.D.	0.00020	N.D.	0.00092	1
05265	Ethylbenzene	100-41-4	0.0011	0.00020	0.0046	0.00087	1
05265	4-Ethyltoluene	622-96-8	0.00026 J	0.00020	0.0013 J	0.00098	1
05265	Heptane	142-82-5	0.0018	0.00020	0.0075	0.00082	1
05265	Hexane	110-54-3	0.0040	0.00020	0.014	0.00070	1
05265	2-Hexanone	591-78-6	N.D.	0.00050	N.D.	0.0020	1
05265	Isooctane	540-84-1	0.011	0.00020	0.052	0.00093	1
05265	Methyl t-Butyl Ether	1634-04-4	N.D.	0.00020	N.D.	0.00072	1
05265	Naphthalene	91-20-3	N.D.	0.00040	N.D.	0.0021	1
05265	Octane	111-65-9	0.00055 J	0.00020	0.0026 J	0.00093	1
05265	Pentane	109-66-0	0.0072	0.00020	0.021	0.00059	1
05265	Toluene	108-88-3	0.012	0.00020	0.044	0.00075	1
05265	1,2,4-Trimethylbenzene	95-63-6	0.00063 J	0.00020	0.0031 J	0.00098	1
05265	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.00020	N.D.	0.00098	1
05265	m/p-Xylene	179601-23-1	0.0036	0.00020	0.015	0.00087	1
05265	o-Xylene	95-47-6	0.0011	0.00020	0.0049	0.00087	1

The sample was collected in a Tedlar bag which is not the container referenced in the EPA method.

MDL = Method Detection Limit

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05265	TO-15 VOA Ext. List Tedlar	EPA TO-15	1	D1318830AB	07/09/2013 10:06	Michael A Ziegler	1

Sample Description: Air Stripper EFFLUENT Grab Air
06261024.0001.00002
Fort Hamilton, NY

LL Sample # AQ 7112223
LL Group # 1400691
Account # 13129

Project Name: Fort Hamilton

Collected: 06/28/2013 11:05 by PB

ARCADIS

Suite 100

Submitted: 06/28/2013 19:24

630 Plaza Drive

Reported: 07/10/2013 19:13

Highlands Ranch CO 80129

ASEFF SDG#: FTH13-03*

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
Volatiles in Air			ppm(v)		mg/m3		
EPA TO-15			ppm(v)		mg/m3		
05265	Acetone	67-64-1	N.D.	0.0050	N.D.	0.012	10
05265	Benzene	71-43-2	0.0047 J	0.0020	0.015 J	0.0064	10
05265	1,3-Butadiene	106-99-0	N.D.	0.0040	N.D.	0.0088	10
05265	2-Butanone	78-93-3	N.D.	0.0050	N.D.	0.015	10
05265	Cumene	98-82-8	N.D.	0.0020	N.D.	0.0098	10
05265	1,2-Dichloropropane	78-87-5	N.D.	0.0020	N.D.	0.0092	10
05265	Ethylbenzene	100-41-4	N.D.	0.0020	N.D.	0.0087	10
05265	4-Ethyltoluene	622-96-8	N.D.	0.0020	N.D.	0.0098	10
05265	Heptane	142-82-5	0.16	0.0020	0.67	0.0082	10
05265	Hexane	110-54-3	0.20	0.0020	0.69	0.0070	10
05265	2-Hexanone	591-78-6	N.D.	0.0050	N.D.	0.020	10
05265	Isooctane	540-84-1	1.1	0.040	5.1	0.19	200
05265	Methyl t-Butyl Ether	1634-04-4	N.D.	0.0020	N.D.	0.0072	10
05265	Naphthalene	91-20-3	N.D.	0.0040	N.D.	0.021	10
05265	Octane	111-65-9	N.D.	0.0020	N.D.	0.0093	10
05265	Pentane	109-66-0	2.8	0.040	8.3	0.12	200
05265	Toluene	108-88-3	0.53	0.0020	2.0	0.0075	10
05265	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.0020	N.D.	0.0098	10
05265	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.0020	N.D.	0.0098	10
05265	m/p-Xylene	179601-23-1	N.D.	0.0020	N.D.	0.0087	10
05265	o-Xylene	95-47-6	N.D.	0.0020	N.D.	0.0087	10

The sample was collected in a Tedlar bag which is not the container referenced in the EPA method.

MDL = Method Detection Limit

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05265	TO-15 VOA Ext. List Tedlar	EPA TO-15	1	D1318830AB	07/09/2013 02:01	Michael A Ziegler	10
05265	TO-15 VOA Ext. List Tedlar	EPA TO-15	1	D1318830AB	07/09/2013 11:32	Michael A Ziegler	200

Quality Control Summary

Client Name: ARCADIS
Reported: 07/10/13 at 07:13 PM

Group Number: 1400691

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: D1318530AA	Sample number(s): 7112221							
Acetone	N.D.	0.00050	ppm (v)	103	114	61-134	10	25
Benzene	N.D.	0.00020	ppm (v)	86	94	70-130	9	25
1,3-Butadiene	N.D.	0.00040	ppm (v)	87	96	66-129	10	25
2-Butanone	N.D.	0.00050	ppm (v)	98	112	55-131	13	25
Cumene	N.D.	0.00020	ppm (v)					
1,2-Dichloropropane	N.D.	0.00020	ppm (v)	86	93	70-130	8	25
Ethylbenzene	N.D.	0.00020	ppm (v)	91	98	70-130	7	25
4-Ethyltoluene	N.D.	0.00020	ppm (v)	90	98	59-126	8	25
Heptane	N.D.	0.00020	ppm (v)	87	94	65-119	9	25
Hexane	N.D.	0.00020	ppm (v)	87	94	63-117	8	25
2-Hexanone	N.D.	0.00050	ppm (v)	96	111	41-152	14	25
Isooctane	N.D.	0.00020	ppm (v)					
Methyl t-Butyl Ether	N.D.	0.00020	ppm (v)	81	91	60-121	12	25
Naphthalene	N.D.	0.00040	ppm (v)	125	137	34-194	9	25
Octane	N.D.	0.00020	ppm (v)					
Toluene	N.D.	0.00020	ppm (v)	92	96	70-130	4	25
1,2,4-Trimethylbenzene	N.D.	0.00020	ppm (v)	86	94	60-128	9	25
1,3,5-Trimethylbenzene	N.D.	0.00020	ppm (v)	91	99	61-132	8	25
m/p-Xylene	N.D.	0.00020	ppm (v)	93	98	70-130	6	25
o-Xylene	N.D.	0.00020	ppm (v)	94	100	70-130	6	25
Batch number: D1318630AA	Sample number(s): 7112221							
Pentane	N.D.	0.00020	ppm (v)					
Batch number: D1318830AB	Sample number(s): 7112222-7112223							
Acetone	N.D.	0.00050	ppm (v)	119	119	61-134	1	25
Benzene	N.D.	0.00020	ppm (v)	92	90	70-130	2	25
1,3-Butadiene	N.D.	0.00040	ppm (v)	93	86	66-129	8	25
2-Butanone	N.D.	0.00050	ppm (v)	115	114	55-131	1	25
Cumene	N.D.	0.00020	ppm (v)					
1,2-Dichloropropane	N.D.	0.00020	ppm (v)	91	89	70-130	2	25
Ethylbenzene	N.D.	0.00020	ppm (v)	101	100	70-130	1	25
4-Ethyltoluene	N.D.	0.00020	ppm (v)	106	105	59-126	1	25
Heptane	N.D.	0.00020	ppm (v)	86	84	65-119	2	25
Hexane	N.D.	0.00020	ppm (v)	90	86	63-117	5	25
2-Hexanone	N.D.	0.00050	ppm (v)	114	115	41-152	1	25
Isooctane	N.D.	0.00020	ppm (v)					
Methyl t-Butyl Ether	N.D.	0.00020	ppm (v)	105	103	60-121	2	25
Naphthalene	N.D.	0.00040	ppm (v)	149	183	34-194	21	25
Octane	N.D.	0.00020	ppm (v)					
Pentane	N.D.	0.00020	ppm (v)					
Toluene	N.D.	0.00020	ppm (v)	99	96	70-130	3	25
1,2,4-Trimethylbenzene	N.D.	0.00020	ppm (v)	102	102	60-128	0	25

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: ARCADIS

Group Number: 1400691

Reported: 07/10/13 at 07:13 PM

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
1,3,5-Trimethylbenzene	N.D.	0.00020	ppm (v)	107	107	61-132	1	25
m/p-Xylene	N.D.	0.00020	ppm (v)	105	103	70-130	2	25
o-Xylene	N.D.	0.00020	ppm (v)	106	104	70-130	2	25

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody



Lancaster Laboratories

Acct. # 13129

For Eurofins Lancaster Laboratories use only
 Group # 1400691 Sample # 7112221-23
Instructions on reverse side correspond with circled numbers.

COC # 333224

1 Client Information				4 Matrix				5 Analysis Requested				For Lab Use Only			
Client: <u>ARCANS - US</u>		Acct. #:		<input type="checkbox"/> Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Ground <input type="checkbox"/> Water <input type="checkbox"/> NPDES <input type="checkbox"/> Surface Other: <u>Air</u>	<input type="checkbox"/> Soil	<input type="checkbox"/> Potable <input type="checkbox"/> Ground <input type="checkbox"/> Water <input type="checkbox"/> NPDES <input type="checkbox"/> Surface Other: <u>Air</u>	Total # of Containers <u>70-15</u>	Preservation Codes				FSC:		SCR#: <u>191242</u> Preservation Codes H=HCl T=Thiosulfate N=HNO ₃ B=NaOH S=H ₂ SO ₄ O=Other	
Project Name#: <u>FORT HAMILTON - USACE</u>		PWSID #:													
Project Manager: <u>Brian Stempkowski</u>		P.O. #:													
Sampler: <u>Paul Boyko</u>		Quote #:													
Name of state where samples were collected: <u>NEW YORK</u>				3						6 Remarks <u>TENLAR BAG SAMPLES.</u>					
2 Sample Identification		Collected		Grab	Composite										
		Date	Time												
<u>MPE INFLUENT - BD</u>		<u>6-28-13</u>	<u>11:15</u>	X				X	1	X					
<u>MPE EFFLUENT</u>			<u>11:10</u>	X				X	1	X					
<u>Air STRIPPER EFFLUENT</u>			<u>11:05</u>	X				X	1	X					

7 Turnaround Time (TAT) Requested (please circle)				Relinquished by		Date	Time	Received by		Date	Time
Standard (Rush TAT is subject to Lancaster Laboratories approval and surcharge.)				<u>Boyl Storage</u>		<u>6/28/13</u>	<u>10:55</u>	<u>[Signature]</u>		<u>6/28/13</u>	<u>10:55</u>
Date results are needed: _____				<u>[Signature]</u>		<u>6/28/13</u>	<u>09:59</u>	<u>Paul Boyko</u>		<u>6-28-13</u>	<u>09:59</u>
E-mail address: _____				<u>Paul Boyko</u>		<u>6-28-13</u>	<u>16:05</u>	<u>[Signature]</u>		<u>6-28-13</u>	<u>16:05</u>
8 Data Package Options (circle if required)				<u>[Signature]</u>		<u>6/28/13</u>	<u>19:24</u>	<u>[Signature]</u>		<u>6/28/13</u>	<u>19:24</u>
Type I (Validation/non-CLP)		Type VI (Raw Data Only)		Relinquished by		Date	Time	Received by		Date	Time
Type III (Reduced non-CLP)		TX TRRP-13		<u>[Signature]</u>		<u>6/28/13</u>	<u>19:24</u>	<u>[Signature]</u>		<u>6/28/13</u>	<u>19:24</u>
Type IV (CLP SOW)		MA MCP CT RCP						Relinquished by Commercial Carrier:			
				EDD Required? Yes No If yes, format: _____				UPS _____ FedEx _____ Other <u>CVZ</u>			
				Site-Specific QC (MS/MSD/Dup)? Yes No (If yes, indicate QC sample and submit triplicate sample volume.)				Temperature upon receipt <u>NA</u> °C			

**Environmental Sample Administration
Receipt Documentation Log**

1400691

Client/Project: Arcadis

Shipping Container Sealed: YES NO

Date of Receipt: 6/28/13

Custody Seal Present * : YES NO

Time of Receipt: 1924

* Custody seal was intact unless otherwise noted in the discrepancy section

Source Code: 01

Package: Chilled Not Chilled

Temperature of Shipping Containers

Cooler #	Thermometer ID	Temperature (°C)	Temp Bottle (TB) or Surface Temp (ST)	Wet Ice (WI) or Dry Ice (DI) or Ice Packs (IP)	Ice Present? Y/N	Loose (L) Bagged Ice (B) or NA	Comments
1							
2							
3							
4							
5							
6							

Number of Trip Blanks received NOT listed on chain of custody: 0

Paperwork Discrepancy/Unpacking Problems:

Unpacker Signature/Emp#: Pat Gu 3472 Date/Time: 6/28/13 2055

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

Inorganic Qualifiers

A	TIC is a possible aldol-condensation product	B	Value is $<$ CRDL, but \geq IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns $>$ 25%	W	Post digestion spike out of control limits
U	Compound was not detected	*	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	+	Correlation coefficient for MSA $<$ 0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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