

de maximis, inc.

200 Day Hill Road
Suite 200
Windsor, CT 06095
(860) 298-0541
(860) 298-0561 FAX

October 15, 2010

Mr. Joseph F. LeMay
Remedial Project Manager
US EPA – New England
5 Post Office Square, Suite 100
Mail Code: OSSR07-4
Boston, MA 02109- 3912

**Subject: Industri-plex Operable Unit 2 Superfund Site
Woburn, Massachusetts
Baseflow Surface Water Monitoring Report**

Dear Mr. LeMay:

Pursuant to Paragraph 34 of the Consent Decree (CD)(Civil Action No.1:08-cv-10325) and Section V.A.5 of the Remedial Design / Remedial Action (RD/RA) Statement of Work (SOW) for the above referenced Site, enclosed please find the Baseflow Surface Water Monitoring Report No. 18.

This report covers the period from September 1 - 30, 2010, and is submitted on behalf of the Settling Defendants.

At this time, the Settling Defendants formally recommend and request that the Surface Water Monitoring Plan for the Site, which EPA conditionally approved on March 11, 2009, be revised to provide for quarterly baseflow surface water monitoring as opposed to monthly baseflow sampling. As demonstrated in the enclosed technical memorandum prepared by GeoSyntec Consultants, if samples were collected on a quarterly basis, the resulting data would be as robust and usable as the data generated by the current monthly sampling program. Due to the very low variability in baseflow water quality, the underlying distribution of baseflow concentrations can be adequately described through four annual sampling events.

To date, the Settling Defendants have collected twenty-seven (27) consecutive months of monthly baseflow data, nine during the “Early Action” sampling events that predated formal SWMP approval, and eighteen pursuant to the SWMP. GeoSyntec’s memorandum demonstrates statistically how quarterly events will serve the objectives of the baseline monitoring program just as well as monthly events. This analysis shows that monthly baseline sampling has never had a statistical advantage over quarterly

sampling. With 27 monthly rounds completed, the objectives of the baseline sampling as articulated in the ROD and SOW (i.e., to evaluate “contaminant trends and migration patterns”) have been achieved fully, and the Settling Defendants believe that there is no reason to continue at this pace.

The Settling Defendants respectfully request that EPA rule on this request before we mobilize for the November, 2010 baseflow sampling event, which is presently scheduled to occur on November 3, 2010. Because Section V.A.3 of the SOW refers to “monthly baseflow surface water sampling,” our request for conversion to quarterly baseflow sampling technically requires a modification to the SOW. Because it will not undermine the quality or the usability of the data generated pursuant to the SWMP, we believe that the requested modification is not “material” and can be effected with EPA’s consent, following consultation with the Commonwealth of Massachusetts, pursuant to paragraph 117 of the Consent Decree.

We look forward to EPA’s prompt decision on this request. Please contact me if you have any questions.

Sincerely,



Bruce Thompson
Project Coordinator

Enclosures:

SWMP Report #18
Geosyntec Monitoring Frequency Analysis

cc: Jen McWeeney - MassDEP
Settling Defendants
Larry McTiernan – Roux Associates

**Baseflow Surface Water Monitoring
Monthly Report No. 18
(September 2010)**

**Industri-plex Superfund Site
Operable Unit 2
Woburn, Massachusetts**

DRAFT

Disclaimer – This document is a DRAFT document prepared by the Settling Defendants under a government Consent Decree. This document has not undergone formal review by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP). The opinions, findings, and conclusions expressed are those of the author and not those of the EPA or the MassDEP.

In accordance with the Surface Water Monitoring Plan (SWMP), this monthly Baseflow Surface Water Monitoring Report has been prepared to summarize the surface water monitoring and maintenance activities performed and the data developed for baseflow conditions during the reporting period (September 2010) and to provide a brief discussion of the data. Surface water monitoring stations are shown in **Figures 1 and 2**.

Monitoring and Maintenance Activities Performed During the Reporting Period

1. Continuous monitoring of stream flow and water quality parameters was conducted at all ten monitoring stations during the reporting period, except during periods of insufficient flow when the In-Situ[®] MP Troll[®] 9500 water quality meters (Trolls) at the Atlantic Avenue Drainway (AAD) and Boston Edison Company right-of-way (BECO ROW) monitoring stations (SW-2-IP and SW-3-IP, respectively) were removed to prevent sensor damage.
2. Regular weekly O&M activities were performed at the surface water monitoring stations on September 2, 8, 9, 16, 23, 29 and 30, 2010, and included the following:
 - Inspected instrumentation and tubing and adjusted as needed.
 - Cleared debris around station instrumentation.
 - Cleaned sample intakes and staff gauges.
 - Cleaned the Isco 750 area-velocity module sensors and the Troll sensors.
 - Checked calibration of the Troll sensors and re-calibrated as needed.
 - Collected manual stage measurements.
 - Checked station power levels.
 - Inspected rain gauges and cleaned as needed.
 - Downloaded flow data stored in the Isco units.
 - Verified the telemetry cable connection.

3. Monthly O&M activities were performed on September 29 and 30, 2010 (in conjunction with weekly O&M activities) and included the following:

- Collected manual velocity measurements.
- Cleaned solar panels and adjusted positioning as necessary.
- Calibrated the Troll sensors.

Note the full Troll sensor calibrations typically conducted as part of monthly O&M activities were not performed in anticipation that storm sampling activities would occur on September 29, 2010. In order to return the Trolls to the monitoring stations prior to the anticipated storm event, the Troll sensors were checked and re-calibrated as needed. As a result, the Troll sensor calibrations were postponed to October 7, 2010.

4. The SWMP monthly baseflow sampling event was conducted on September 9, 2010 and included the following:

- Collected baseflow surface water samples at nine SWMP monitoring stations.¹
- Measured groundwater and surface water elevations at eight of the ten SWMP monitoring stations.²

Data Generated During the Reporting Period

1. Water quality parameters recorded at the time of baseflow sampling on September 9, 2010 are provided in **Tables 1a through 1j**, along with the water quality measurements made during all previous SWMP and, where performed, “Early Action” baseflow sampling events.
2. Analytical results for the baseflow samples collected during this and the previous reporting period³ are provided in **Tables 2a through 2j** along with validated analytical

¹ Station SW-3-IP (BECO ROW) did not exhibit discernible flow at the time of baseflow sampling.

² There is no piezometer at the Mishawum Road monitoring station (SW-04-TT), and as mentioned previously, Station SW-3-IP (BECO ROW) did not exhibit discernible flow at the time of baseflow sampling. Station SW-03-TT (Aberjona) was gauged on September 16, 2010.

³ These results have not yet been validated.

laboratory results for baseflow samples collected during previous SWMP sampling events⁴ and, where performed, Early Action and other previous sampling programs at the site (i.e., the Groundwater and Surface Water Investigation Plan [GSIP] and the Multiple Source Groundwater Response Plan [MSGRP]).

3. Groundwater and surface water elevation data are provided in **Table 3**.

Data Analysis

Analytical Results – Benzene, total arsenic, dissolved arsenic, and ammonia concentrations detected in baseflow samples collected during the SWMP and previous sampling programs (GSIP, MSGRP, and Early Action) are summarized in box-whisker plots in **Appendix A**. The most recent SWMP results are shown as solid circles (unless the analyte was not detected), while the previous SWMP results and all results from previous sampling programs are plotted as “boxes” and “whiskers.”⁵ The boxes indicate the range within which the central fifty percent of the results fall (the box edges mark the first and third quartiles and the line dividing the box marks the median value), while the whiskers show the full range of values reported.⁶

Based on baseflow analytical data collected during the GSIP, MSGRP, Early Action, and the OU2 SWMP sampling programs, the following is noted:

- Benzene has never been detected in any of the baseflow samples collected from Stations SW-2-IP, SW-01-TT, SW-03-TT, and SW-05-TT through SW-08-TT and has only been detected seasonally at Stations SW-3-IP, SW-02-TT, and SW-04-TT. Moreover, the maximum concentrations of benzene detected in the baseflow samples collected at stations SW-3-IP, SW-02-TT, and SW-04-TT are 3.5 µg/L (March 2009), 0.9 µg/L (March 2009), and 0.46J µg/L (April 2009), respectively. These maxima are over an order of magnitude lower than the benzene Surface Water Performance Standard of 46 µg/L.

⁴ Note that July 2010 and August 2010 results have not yet been validated.

⁵ Since at least two values are required to construct a “box,” previous results are shown as individual diamonds in those cases where the analyte was detected in only one sample during a particular sampling program.

⁶ Any statistical outliers have not been determined or identified.

- Except at Stations SW-3-IP, SW-03-TT, and SW-04-TT all dissolved arsenic concentrations measured during baseflow have been over an order of magnitude lower than the arsenic Surface Water Performance Standard of 150 µg/L. Moreover, the maximum concentrations of dissolved arsenic detected in the baseflow samples collected at Stations SW-3-IP (79 µg/L, January 2010), SW-03-TT (24.2 µg/L, November 2001), and SW-04-TT (16 µg/L, August 2010) are well below the Surface Water Performance Standard.

These observations are consistent with those noted in previous reports.

Elevation Data – Based on the groundwater and surface water elevations measured during the MSGRP and SWMP, the following is noted:

- At three of the nine stations gauged (SW-2-IP, SW-01-TT, and SW-08-TT), surface water elevations have been predominantly higher than groundwater elevations during baseflow conditions.
- At four of the stations (SW-3-IP, SW-03-TT, SW-06-TT, and SW-07-TT), surface water elevations have been predominantly lower than groundwater elevations during baseflow conditions.
- The remaining two stations (SW-02-TT and SW-05-TT) have exhibited variable trends.

With the exception of SW-02-TT, which has exhibited downward trends over the previous five months, these observations are consistent with those noted in previous reports.

TABLES

(Note: the data presented in tables 1, 2, and 3 are cumulative; values shown supersede previously reported data.)

DRAFT

**Table 1a
Baseflow Water Quality Parameters for SW-2-IP (AAD)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts**

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-2-IP	08/21/08	23.8	9.0	7.1	222.8	613.7	3.6
	09/18/08	15.6	9.5	6.9	149.2	233.9	47.2
	10/09/08	17.5	9.1	7.1	188.3	497.2	1.6
	11/05/08	13.3	10.8	7.4	431.8	ERR	7.5
	12/09/08	-0.6	9.9	6.5	443.7	512.0	1.8
	01/20/09	0.1	6.4	6.8	160.0	1161.0	177.5
	02/02/09	-0.8	NM	6.6	466.6	1464.0	2.0
	03/18/09	8.9	1.9	7.0	249.4	1418.0	23.0
	04/01/09	5.6	2.0	7.0	352.5	1286.0	2.3
Surface Water Monitoring Plan							
SW-2-IP	04/17/09	17.3	13.2	7.4	55.0	785.7	0.3
	05/12/09	16.9	9.6	7.4	396.6	783.0	2.2
	06/02/09	21.4	12.5	7.7	114.9	841.0	1.9
	07/15/09	25.3	5.8	7.1	375.5	362.0	2.1
	08/05/09	27.3	5.6	7.0	414.0	413.1	0.9
	09/02/09	21.7	7.7	7.2	361.0	597.0	2.9
	10/15/09	7.6	6.3	7.5	384.0	559.0	2.0
	11/03/09	9.8	10.9	7.4	63.0	407.0	10.9
	12/02/09	5.1	12.6	7.3	251.0	666.0	0.9
	01/06/10	0.0	9.4	7.1	676.0	971.0	2.9
	02/03/10	0.1	10.6	7.1	344.0	948.0	3.5
	03/08/10	10.1	10.4	7.3	173.2	687.0	6.2
	04/13/10	14.2	9.8	7.7	348.9	676.0	5.3
	05/05/10	19.7	9.9	7.6	313.8	900.0	2.9
	06/09/10	23.2	11.8	8.6	280.8	634.0	4.6
	07/07/10	NM	NM	NM	NM	NM	NM
	08/04/10	NM	NM	NM	NM	NM	NM
09/09/10	18.6	5.8	6.7	235.8	383.0	0.0	

Notes:

AAD = Atlantic Avenue Drainway
 °C = Degrees Celsius
 mg/l = milligrams per liter
 s.u. = standard units
 mV = milliVolts
 µS/cm = microSiemens per centimeter
 NTU = Nephelometric Turbidity Units
 NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)
 ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

**Table 1b
Baseflow Water Quality Parameters for SW-3-IP (Boston Edison Co. ROW)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts**

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-3-IP	08/21/08	19.7	9.6	7.5	210.4	906.2	5.2
	09/18/08	NM	NM	NM	NM	NM	NM
	10/09/08	17.4	5.9	7.1	179.4	697.0	4.2
	11/05/08	NM	NM	NM	NM	NM	NM
	12/09/08	NM	NM	NM	NM	NM	NM
	01/20/09	NM	NM	NM	NM	NM	NM
	02/02/09	5.2	9.0	6.8	-17.0	800.7	1.4
	03/18/09	10.5	3.7	7.1	162.4	193.0	58.2
	04/01/09	4.1	2.3	6.8	110.2	ERR	21.3
Surface Water Monitoring Plan							
SW-3-IP	04/17/09	16.4	11.7	6.8	-70.0	908.3	4.7
	05/12/09	13.5	7.3	7.3	370.7	3.0	24.3
	06/02/09	NM	NM	NM	NM	NM	NM
	07/15/09*	14.7	0.0	11.8	7.5	22.0	344.8
	08/05/09*	14.6	0.0	4.0	7.6	26.0	ERR
	09/02/09	NM	NM	NM	NM	NM	NM
	10/15/09	NM	NM	NM	NM	NM	NM
	11/03/09	10.9	5.6	6.7	25.0	533.0	5.4
	12/02/09	NM	NM	NM	NM	NM	NM
	01/06/10	3.4	6.2	7.1	572.0	1637.0	114.5
	02/03/10	3.5	11.7	7.1	347.0	927.0	9.0
	03/08/10	9.2	1.4	7.2	-67.5	36.0	13.6
	04/13/10	18.7	5.6	7.1	183.0	152.0	15.5
	05/05/10	15.4	7.0	7.5	307.0	2.0	6.5
	06/09/10	NM	NM	NM	NM	NM	NM
	07/07/10	NM	NM	NM	NM	NM	NM
	08/04/10	NM	NM	NM	NM	NM	NM
09/09/10	NM	NM	NM	NM	NM	NM	

Notes:

BECO ROW = Boston Edison Company right-of-way

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NS = Not Sampled

NM = Not measured (eg. insufficient flow and/or due to equipment limitations)

ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

* = Barely discernible flow and limited flushing of water was observed; therefore, water quality parameters are not likely representative of baseflow conditions

Table 1c
Baseflow Water Quality Parameters for SW-01-TT (Halls Brook)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-01-TT	08/21/08	17.3	8.3	7.1	250.2	832.3	9.1
	09/18/08	14.3	8.6	7.1	176.7	755.9	6.3
	10/09/08	15.1	7.5	6.9	169.7	899.5	15.6
	11/05/08	9.7	7.1	6.8	508.3	2774.0	27.5
	12/09/08	2.2	9.0	6.8	483.9	3056.0	47.3
	01/20/09	0.4	12.4	7.0	81.0	1362.0	24.7
	02/02/09	1.7	7.8	6.9	-287.4	1184.0	8.1
	03/18/09	7.1	ERR	ERR	10.3	ERR	44.5
	04/01/09	7.1	ERR	ERR	6.7	ERR	388.4
Surface Water Monitoring Plan							
SW-01-TT	04/17/09	13.0	15.7	6.9	34.0	965.5	3.7
	05/12/09	15.7	8.0	7.2	499.7	662.0	18.7
	06/02/09	16.2	8.7	7.7	93.7	923.0	49.8
	07/15/09	18.8	3.9	6.9	518.3	743.0	133.8
	08/05/09	20.9	ERR	6.7	470.9	800.0	ERR
	09/02/09	15.7	ERR	5.1	544.9	753.0	119.3
	10/15/09	7.5	5.6	7.3	390.0	793.0	5.1
	11/03/09	9.8	8.5	7.0	64.0	566.0	18.6
	12/02/09	6.3	12.3	7.1	254.0	747.0	3.6
	01/06/10	1.7	10.0	7.0	643.0	1177.0	7.3
	02/03/10	1.7	12.0	7.0	374.0	1018.0	9.0
	03/08/10	9.3	10.3	7.1	ERR	ERR	7.4
	04/13/10	12.7	10.3	7.1	352.0	777.0	3.3
	05/05/10	15.4	8.7	7.0	373.0	1053.0	3.9
	06/09/10	16.4	7.8	7.1	470.0	684.4	6.8
	07/07/10	25.1	8.1	7.2	256.0	838.4	3.8
	08/04/10	21.2	5.4	6.9	523.2	787.0	2.4
	09/09/10	17.1	7.3	6.4	482.1	812.0	5.4

Notes:

- °C = Degrees Celsius
- mg/l = milligrams per liter
- s.u. = standard units
- mV = millivolts
- µS/cm = microSiemens per centimeter
- NTU = Nephelometric Turbidity Units
- ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

Table 1d
Baseflow Water Quality Parameters for SW-02-TT (HBHA Pond Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-02-TT	08/21/08	23.7	7.4	6.8	264.5	880.3	6.2
	09/18/08	17.4	6.3	6.8	178.9	728.0	5.7
	10/09/08	16.5	7.9	6.8	192.2	888.2	5.4
	11/05/08	8.6	7.1	6.7	466.9	854.0	30.2
	12/09/08	1.7	10.3	6.5	504.2	780.0	13.5
	01/20/09	0.9	13.9	6.8	139.0	11.8	9.2
	02/02/09	1.2	NM	6.4	336.6	1176.0	14.8
	03/18/09	7.1	11.3	6.5	451.4	11.7	24.2
	04/01/09	7.1	10.0	6.5	479.3	948.0	16.8
Surface Water Monitoring Plan							
SW-02-TT	04/17/09	12.5	10.4	6.8	74.0	959.5	22.5
	05/12/09	14.8	7.6	6.7	480.8	800.0	30.1
	06/02/09	18.1	14.8	7.3	139.2	974.0	24.9
	07/15/09	21.1	4.4	6.3	489.0	781.0	62.4
	08/05/09	22.2	3.7	6.5	432.2	754.0	11.7
	09/02/09	19.8	5.3	6.5	505.6	672.0	123.5
	10/15/09	9.5	6.0	7.2	383.0	841.0	9.7
	11/03/09	12.5	7.0	6.7	54.0	579.0	31.3
	12/02/09	5.5	10.6	6.9	223.0	739.0	4.2
	01/06/10	1.9	7.4	6.8	522.0	1349.0	54.4
	02/03/10	1.8	10.9	6.8	376.0	1017.0	11.8
	03/08/10	7.7	8.8	6.7	256.9	837.0	12.3
	04/13/10	10.7	8.3	6.7	618.0	755.0	8.3
	05/05/10	17.2	5.8	6.6	464.6	909.0	77.9
	06/09/10	19.0	5.4	6.5	499.6	833.0	9.2
	07/07/10	27.8	6.5	6.6	334.6	1197.0	11.2
	08/04/10	23.5	6.8	6.9	336.5	1106.0	0.4
09/09/10	20.3	6.0	6.7	343.6	890.0	5.9	

Notes:

HBHA = Halls Brook Holding Area
°C = Degrees Celsius
mg/l = milligrams per liter
s.u. = standard units
mV = milliVolts
µS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Units
NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)
ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

Table 1e
Baseflow Water Quality Parameters for SW-04-TT (HBHA Wetland Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Remedial Design "Early Action"							
SW-04-TT	08/21/08	20.2	9.8	6.8	224.0	883.1	8.4
	09/18/08	16.8	7.0	6.8	81.7	727.8	9.6
	10/09/08	18.0	8.0	6.8	138.4	920.0	8.1
	11/05/08	8.7	2.7	6.7	243.7	916.0	0.0
	12/09/08	1.4	8.8	6.0	350.9	778.0	0.0
	01/20/09	0.2	4.6	6.0	NM	1172.0	0.0
	02/02/09	0.8	4.5	8.0	335.5	1394.0	0.0
	03/18/09	10.6	14.2	7.8	222.8	1063.0	0.2
	04/01/09	6.8	10.7	7.8	226.0	844.0	0.0
Surface Water Monitoring Plan							
SW-04-TT	04/17/09	11.9	10.7	6.9	-10.0	1289.0	3.3
	05/12/09	19.4	11.7	6.8	286.0	570.0	7.5
	06/02/09	19.0	13.9	7.5	83.6	978.0	9.6
	07/15/09	23.2	7.6	6.9	387.2	781.0	21.4
	08/05/09	6.9	ERR	ERR	ERR	ERR	ERR
	09/02/09	6.9	ERR	ERR	19.4	18.0	472.7
	10/15/09	9.1	5.6	7.1	383.0	821.0	21.4
	11/03/09	12.2	8.6	6.8	64.0	572.0	5.3
	12/02/09	6.8	10.3	6.9	190.0	734.0	3.2
	01/06/10	2.2	9.1	6.8	493.0	1371.0	5.7
	02/03/10	1.9	11.0	6.8	362.0	1023.0	6.0
	03/08/10	9.1	10.1	6.9	486.7	933.1	6.4
	04/13/10	12.4	11.7	7.2	285.0	775.0	8.1
	05/05/10	21.1	8.5	7.4	326.9	995.0	30.1
	06/09/10	23.5	6.7	7.0	344.0	788.0	11.7
	07/07/10	35.6	10.0	7.6	259.0	1211.0	7.1
	08/04/10	24.6	4.7	7.1	205.0	1079.0	5.2
09/09/10	18.5	6.1	6.6	268.7	794.0	4.8	

Notes:

HBHA = Halls Brook Holding Area
 °C = Degrees Celsius
 mg/l = milligrams per liter
 s.u. = standard units
 mV = milliVolts
 µS/cm = microSiemens per centimeter
 NTU = Nephelometric Turbidity Units
 NM = Not measured (eg. insufficient flow and/or due to equipment limitations)
 ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

Table 1f
Baseflow Water Quality Parameters for SW-03-TT (Aberjona)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-03-TT	04/17/09	13.5	11.1	6.6	36.0	967.8	7.8
	05/12/09	18.7	5.2	6.9	79.6	733.0	67.9
	06/02/09	16.9	5.8	7.5	31.8	1261.0	1257.0
	07/15/09	20.4	5.0	6.6	493.1	826.0	22.7
	08/05/09	22.1	3.0	6.7	494.8	708.0	ERR
	09/02/09	17.3	2.5	6.6	440.9	832.0	75.4
	10/15/09	8.4	4.8	7.1	383.0	944.0	2.9
	11/03/09	10.7	5.7	6.5	59.0	678.0	4.3
	12/02/09	7.0	9.0	6.9	184.0	873.0	2.3
	01/06/10	2.2	9.3	7.0	437.0	1329.0	3.1
	02/03/10	3.1	11.0	6.9	354.0	1263.0	4.9
	03/08/10	4.1	9.4	7.0	448.0	988.1	3.9
	04/13/10	11.3	9.9	6.9	340.0	868.0	11.6
	05/05/10	15.3	6.3	6.6	261.4	1056.0	11.7
	06/09/10	16.3	4.6	6.8	125.7	222.0	10.3
	07/07/10	29.2	7.7	6.1	99.6	1000.0	5.4
08/04/10	21.9	3.8	6.5	77.8	1261.0	15.9	
09/09/10	17.7	4.9	6.3	207.7	1058.0	5.8	

Notes:

- °C = Degrees Celsius
- mg/l = milligrams per liter
- s.u. = standard units
- mV = millivolts
- µS/cm = microSiemens per centimeter
- NTU = Nephelometric Turbidity Units
- ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

Table 1g
Baseflow Water Quality Parameters for SW-05-TT (Salem Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-05-TT	04/17/09	10.7	10.7	7.0	54.0	1154.0	5.1
	05/12/09	17.9	3.1	7.1	319.8	929.0	41.7
	06/02/09	18.9	12.3	7.6	135.1	1121.0	12.9
	07/15/09	20.5	9.2	6.8	429.6	1086.0	20.7
	08/05/09	22.7	0.4	6.7	472.2	936.0	10.3
	09/02/09	6.8	ERR	ERR	17.6	ERR	480.9
	10/15/09	8.4	5.5	7.2	370.0	927.0	5.7
	11/03/09	10.4	8.5	6.8	73.0	633.0	3.3
	12/02/09	6.3	10.2	6.8	237.0	838.0	3.0
	01/06/10	1.6	9.0	6.8	613.0	1432.0	9.3
	02/03/10	2.0	10.8	6.9	375.0	1173.0	6.6
	03/08/10	6.7	9.9	6.9	326.1	1137.0	9.4
	04/13/10	10.7	9.0	6.8	194.0	919.0	11.1
	05/05/10	16.3	8.3	6.9	152.4	1138.0	26.7
	06/09/10	18.4	4.0	6.7	281.0	1047.0	11.6
	07/07/10	27.4	4.1	7.1	365.8	1001.0	20.1
	08/04/10	23.1	5.7	7.3	371.3	1296.0	9.8
09/09/10	18.2	6.8	6.7	407.7	829.0	7.1	

Notes:

- °C = Degrees Celsius
- mg/l = milligrams per liter
- s.u. = standard units
- mV = milliVolts
- µS/cm = microSiemens per centimeter
- NTU = Nephelometric Turbidity Units
- ERR = Equipment error (e.g., ice buildup, sensor drift, stage below sensor(s), struck by debris, and/or buildup on sensor)

Table 1h
Baseflow Water Quality Parameters for SW-06-TT (Montvale Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-06-TT	04/17/09	8.7	10.5	7.0	145.0	1212.0	3.3
	05/12/09	14.6	14.3	6.8	420.4	723.2	17.2
	06/02/09	16.6	6.7	7.5	96.9	1120.0	32.6
	07/15/09	17.4	7.0	7.0	425.0	780.0	6.9
	08/05/09	25.1	7.6	7.0	382.5	824.0	0.0
	09/02/09	15.9	7.0	6.9	464.5	825.0	70.6
	10/15/09	7.1	5.7	7.3	372.0	924.0	3.6
	11/03/09	8.8	8.8	6.8	51.0	635.0	3.5
	12/02/09	5.3	12.9	6.8	258.0	875.0	3.3
	01/06/10	1.0	10.1	7.0	595.0	1411.0	5.6
	02/03/10	1.3	11.0	7.0	365.0	1191.0	18.8
	03/08/10	5.6	12.3	7.1	61.1	1033.0	4.8
	04/13/10	9.3	10.5	7.1	193.0	847.0	5.2
	05/05/10	14.8	4.0	6.9	450.6	993.0	25.6
	06/09/10	16.0	5.3	7.1	401.1	960.0	35.2
	07/07/10	24.4	3.5	7.0	394.3	1162.0	15.6
08/04/10	22.4	4.0	7.0	420.8	1139.0	25.0	
09/09/10	18.0	5.2	6.7	301.9	1076.0	8.0	

Notes:

- °C = Degrees Celsius
- mg/l = milligrams per liter
- s.u. = standard units
- mV = milliVolts
- µS/cm = microSiemens per centimeter
- NTU = Nephelometric Turbidity Units

Table 1i
Baseflow Water Quality Parameters for SW-07-TT (Swanton Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-07-TT	04/17/09	9.3	11.2	6.9	60.0	1145.0	2.6
	05/12/09	14.6	8.4	6.9	464.2	920.0	23.7
	06/02/09	16.8	7.5	7.9	54.8	1042.0	1.5
	07/15/09	17.8	6.5	6.9	466.6	1028.0	2.9
	08/05/09	21.5	4.8	7.0	522.7	908.0	4.2
	09/02/09	17.5	7.6	7.0	443.8	767.0	7.3
	10/15/09	7.8	5.5	7.1	372.0	891.0	3.2
	11/03/09	9.2	8.5	6.8	86.0	614.0	2.3
	12/02/09	5.4	11.7	6.9	338.0	844.0	1.8
	01/06/10	1.5	10.2	6.9	589.0	1198.0	5.1
	02/03/10	1.8	12.1	7.1	365.0	1109.0	4.6
	03/08/10	6.1	10.4	7.0	323.0	1052.0	4.5
	04/13/10	9.9	9.5	7.0	180.3	727.0	10.2
	05/05/10	15.6	4.1	6.8	279.9	948.0	26.3
	06/09/10	17.0	3.8	6.7	261.2	703.0	25.7
	07/07/10	23.8	4.5	6.8	413.8	1105.0	5.1
08/04/10	20.8	4.0	6.8	458.6	1129.0	5.7	
09/09/10	18.8	6.3	6.6	442.0	616.0	4.0	

Notes:

°C = Degrees Celsius

mg/l = milligrams per liter

s.u. = standard units

mV = milliVolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

The specific conductance value recorded during the January 2010 baseflow sampling event was rejected following internal QA review; value shown was measured on January 14, 2010.

Table 1j
Baseflow Water Quality Parameters for SW-08-TT (USGS / Mystic Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (°C)	Dissolved Oxygen (mg/l)	pH (s.u.)	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
Surface Water Monitoring Plan							
SW-08-TT	04/17/09	9.9	10.9	6.9	177.0	1074.0	5.2
	05/12/09	15.0	7.1	6.9	498.0	878.0	46.3
	06/02/09	16.6	9.3	8.4	63.4	970.0	33.3
	07/15/09	19.4	6.8	7.3	432.7	987.0	3.3
	08/05/09	23.0	6.2	7.1	436.4	902.0	7.7
	09/02/09	17.0	7.4	7.1	360.5	765.0	3.4
	10/15/09	8.6	5.7	7.0	370.0	834.0	3.3
	11/03/09	9.8	8.3	6.8	96.0	578.0	8.8
	12/02/09	5.9	12.0	6.9	352.0	799.0	1.5
	01/06/10	1.7	11.3	6.9	593.0	997.0	5.0
	02/03/10	2.0	12.3	7.1	360.0	972.0	0.4
	03/08/10	5.1	10.3	7.1	431.3	883.0	7.8
	04/13/10	10.7	10.3	7.4	261.0	610.0	5.2
	05/05/10	16.4	4.5	6.9	292.0	917.0	11.3
	06/09/10	17.5	5.4	7.0	130.0	712.8	22.9
	07/07/10	24.3	4.3	7.0	233.0	987.0	1.4
08/04/10	21.2	4.7	7.0	245.1	958.0	4.4	
09/09/10	15.9	12.7	7.1	440.5	712.0	4.2	

Notes:

USGS = United States Geological Survey
 °C = Degrees Celsius
 mg/l = milligrams per liter
 s.u. = standard units
 mV = milliVolts
 µS/cm = microSiemens per centimeter
 NTU = Nephelometric Turbidity Units

Table 2a
Baseflow Laboratory Analytical Results for SW-2-IP (Atlantic Avenue Drainway)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan													
SW-2	08/29/00	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/05/00	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	04/05/01	NC	--	0.0098B	0.0068B	--	--	10.8	--	--	--	--	--
Remedial Design "Early Action"													
SW-2-IP	08/21/08	NM	0.5U	0.007	0.005U	--	--	5U	0.088	0.05J	0.24	0.4	0.31
	09/18/08	NM	0.5U	0.005U	0.005U	--	--	5U	0.075J	0.05U	0.15	0.47	0.47
	10/09/08	NM	0.5U	0.005U	0.005U	--	--	5U	0.0618J	0.034J	0.32	0.35	0.35
	11/05/08	0.02	0.5U	0.0028J	0.005U	--	--	5U	0.0623J	0.05U	0.4	0.86	0.86
	12/09/08	0.79	0.5U	0.003U	0.003U	--	--	5U	0.402	0.02U	0.52	0.71	0.31
	01/20/09	NM	0.5U	0.003U	0.003U	--	--	5U	1.74	0.05U	0.57	2	0.3U
	02/02/09	NM	0.5U	0.003U	0.003U	--	--	5U	1.13	0.044J	0.62	1.9	0.77
	03/18/09	1.57	0.5U	0.003U	0.003U	--	--	5U	0.328	0.05U	1.1	0.8	0.47
	04/01/09	0.24	0.5U	0.003U	0.003U	--	--	5U	0.403	0.05U	0.89	0.87	0.47
Surface Water Monitoring Plan													
SW-2-IP	04/17/09	1.34	0.5U	0.003U	0.003U	0.23	0.08	5U	0.0468J	0.05U	0.87	0.46U	0.46
	05/12/09	1.47	0.5U	0.003U	0.003U	0.59	0.037J	5U	0.103	0.05U	0.21	0.9U	0.8
	06/02/09	NM	0.5U	0.0023J	0.0025J	1.2	0.4	5U	0.088	0.05U	0.46	0.58	0.49
	07/15/09	0.45	0.5U	0.0023J	0.003	0.74	0.35	5U	0.091	0.14	0.32	0.44	0.35
	08/05/09	1.18	0.5U	0.003U	0.003U	1	0.46	5U	0.107	0.05U	0.25	0.47	0.36
	09/02/09	0.83	0.5U	0.0024J	0.0024J	0.54	0.19	5U	0.145	0.036J	0.14	0.43U	0.3U
	10/15/09	0.61	0.5U	0.003U	0.003U	0.32	0.15	5U	0.15U	0.05U	0.15	0.44	0.3U
	11/03/09	5.91	0.5U	0.003U	0.003U	0.37	0.16	5U	0.156	0.05U	0.3	0.45	0.3U
	12/02/09	0.05	0.5U	0.0022J	0.003U	0.49	0.16	5U	0.62	0.05U	0.55	0.73	0.3U
	01/06/10	0 [†]	0.5U	0.003U	0.003U	1.2	0.18	5U	0.578	0.05U	0.73	0.84	0.26J
	02/03/10	0.79	0.5U	0.003U	0.003U	0.43	0.1	5U	0.357	0.05U	0.67	0.7	0.34
	03/08/10	0.29	0.5U	0.003U	0.003U	0.29	0.1	5U	0.258	0.05U	0.86	0.66	0.4
	04/13/10	1.02	0.5U	0.0028J	0.0021J	0.69J	0.046J	6.1	0.179	0.05U	0.83	1	0.82
	05/05/10	0.59	0.5U	0.003U	0.003U	0.67	0.3	5U	0.124	0.05U	1.3	0.61	0.49
	06/09/10	0.56	0.5U	0.003U	0.003U	0.92	0.39	42	0.0656J	0.034J	0.71	0.59	0.59
	07/07/10	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/04/10	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/09/10*	0.11	0.5U	0.003U	0.003U	0.48	0.14	5U	0.0471J	0.1U	0.05U	0.42	0.42

Notes:

- Prior to the 12/02/09 baseflow event, flow was calculated based on stage and velocity measurements.
- Between the 12/02/09 and 03/08/10 baseflow events, flow was calculated based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- Flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.
- Due to damage to the area-velocity sensor, the flow value shown on September 9, 2010 was estimated based on stage observed on the staff gauge at the time of the baseflow sampling event.

AAD = Atlantic Avenue Drainway

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NS = Not sampled

-- = Sample not analyzed for this compound

NC = Not Calculated

B = For organic analytes, compound detected in laboratory blank; for inorganic analytes, analyte below reporting limit, but greater than or equal to 1/2 the laboratory detection limit (value is estimate)

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated

NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)

[†] Based on the rating curve, flow was 0 cfs; however, Roux Associates observed flow at the time of sampling below the crest of the weir.

* = Not yet validated

Table 2b
Baseflow Laboratory Analytical Results for SW-3-IP (Boston Edison Co. ROW)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan													
SW-3	08/29/00	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/05/00	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	04/05/01	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Remedial Design "Early Action"													
SW-3-IP	08/21/08	NM	--	--	--	--	--	--	23.5	--	--	--	--
	09/18/08	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/09/08	NM	0.5U	0.0028J	0.0047J	--	--	84	12.3	0.15	1.1	13	0.7
	11/05/08	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/09/08	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	01/20/09	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/02/09	NM	0.43J	0.22	0.029	--	--	650	15.7	0.11	1.2	16	0.3
	03/18/09	0.15	3.5	0.144	0.029	--	--	93	22.6	0.036J	1.3	24	1.4
04/01/09	0.02	3.2	0.087	0.055	--	--	35	25.5	0.034J	1.1	26	0.5	
Surface Water Monitoring Plan													
SW-3-IP	04/17/09	0.09	1.3	0.419	0.037	39	2.6	1100	20.1	0.08	1.8	22	1.9
	05/12/09	0.05	0.5U	0.028	0.004	1.7	0.08	140	11.5	0.13	1.5	12	0.5
	06/02/09	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	07/15/09	0.06	0.5U	0.01	0.006	0.42	0.05	5U	14.3	0.22	1.1	14	0.3U
	08/05/09	0.04	0.5U	0.032	0.009	1.1	0.028J	5U	17.3	0.1	0.55	18	0.7
	09/02/09	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/15/09	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/03/09	NM	0.5U	0.014	0.012	1.3	0.98	5U	11.9	0.049J	0.83	12	0.3U
	12/02/09	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	01/06/10	0.09	2.8	0.094	0.079	6.3	6.2	10	29.5	0.044J	1.7	32	2.5
	02/03/10	NM	2	0.064	0.056	4.2	3.1	7.9	31	0.035J	1.2	30	0.3U
	03/08/10	0.32	1.8	0.049	0.049	3.2	2.7	5.3	29.9	0.06	0.99	30	0.3U
	04/13/10	0.08	3.4	0.064	0.057	3.4J	2.3	8.9	29.3	0.049J	1.1	30	0.7
	05/05/10	NM	0.5U	0.031	0.021	2	0.94	6.4	7.98	0.05	0.58	8.5	0.52
	06/09/10	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	07/07/10	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
08/04/10	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
09/09/10	NM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	

Notes:

- Flows shown are estimated based on stage and velocity.

BECO ROW = Boston Edison Company right-of-way

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NS = Not Sampled

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimate

NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)

* = Not yet validated

Table 2c
Baseflow Laboratory Analytical Results for SW-01-TT (Halls Brook)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan													
SW-1	08/29/00	NC	--	0.0036J	0.0031U	--	--	8	--	--	--	--	--
	10/05/00	NC	--	0.0025U	0.0025U	--	--	5U	--	--	--	--	--
	04/05/01	NC	--	0.0035U	0.0035U	--	--	5U	--	--	--	--	--
Multiple Source Groundwater Response Plan													
SW-01-TT	07/14/01	NC	--	0.0037UJ	0.0012UJ	1.25	0.567	4.1	--	--	--	--	--
	08/23/01	NC	--	0.009U	0.0052U	1.1J	0.153J	6.8	--	--	--	--	--
	09/18/01	NC	--	0.0022J	0.0012U	0.457	0.134U	1.6J	--	--	--	--	--
	10/22/01	NC	--	0.003U	0.003U	0.378	0.218	4U	--	--	--	--	--
	11/19/01	NC	--	0.003U	0.003U	0.285J	0.114	1J	--	--	--	--	--
	12/17/01	NC	--	0.003U	0.0034J	0.591J	0.105J	10.4	--	--	--	--	--
	01/04/02	NC	--	0.003U	0.003U	0.847	0.22U	4	--	--	--	--	--
	02/15/02	NC	--	0.0024U	0.0024U	1.05	0.342	11J	--	--	--	--	--
	03/12/02	NC	--	0.0017U	0.0017U	0.725	0.395	2.4J	--	--	--	--	--
	04/17/02	NC	--	0.002U	0.002U	1.17J	0.499	5.7	--	--	--	--	--
	05/08/02	NC	--	0.002U	0.002U	1.16	0.538	3.4J	--	--	--	--	--
	06/20/02	NC	--	0.002U	0.002U	1.65	0.868	6.4J	--	--	--	--	--
	07/16/02	NC	--	0.0038	0.0013U	1.21	0.0742U	7.2	--	--	--	--	--
	08/06/02	NC	--	0.0032	0.0014J	0.915	0.075U	3.2J	--	--	--	--	--
	09/10/02	NC	--	0.0023UJ	0.0013U	0.732	0.105U	3.4J	--	--	--	--	--
10/25/02	NC	--	0.003U	0.003U	0.373	0.152	2UJ	--	--	--	--	--	
Remedial Design "Early Action"													
SW-01-TT	08/21/08	NM	0.5U	0.005J	0.005J	--	--	5U	3.51	0.13	1.2	2.6	0.3U
	09/18/08	NM	0.5U	0.005U	0.005U	--	--	5U	3.13	0.06	1.1	3.7	0.57
	10/09/08	NM	0.5U	0.005U	0.005U	--	--	5U	3.98	0.08	1	4.8	0.82
	11/05/08	3.16	0.5U	0.005U	0.005U	--	--	6	2.58	0.04J	0.81	4	1.4
	12/09/08	5.70	0.5U	0.003U	0.003U	--	--	8.1	3.96	0.01J	7.6	5	1
	01/20/09	NM	0.5U	0.003U	0.003U	--	--	7.9	3.24	0.034J	1	3.6	0.36
	02/02/09	6.12	0.5U	0.003U	0.003U	--	--	5U	2.89	0.06	1.1	3.5	0.61
	03/18/09	8.19	0.5U	0.003U	0.003U	--	--	5U	2.75	0.05U	1.1	3.8	1
	04/01/09	7.89	0.5U	0.003U	0.003U	--	--	12	2.09	0.05U	0.86	3.2	1.1
	Surface Water Monitoring Plan												
SW-01-TT	04/17/09	8.86	0.5U	0.005	0.003	0.92	0.26	5U	2.43	0.036J	1	3	0.57
	05/12/09	7.53	0.5U	0.002J	0.003U	1.3	0.5	5U	2.97	0.05	0.96	3.8	0.83
	06/02/09	4.19	0.5U	0.003	0.003U	0.76	0.23	5U	2.39	0.32	0.96	2.7	0.31
	07/15/09	0.81	0.5U	0.005	0.0025J	1.3	0.72	5U	3.34	0.13	0.99	3.9	0.56
	08/05/09	0.81	0.5U	0.0026J	0.003U	1.4	0.74	5U	2.99	0.07	1	3.7	0.71
	09/02/09	0.81	0.5U	0.0027J	0.0024J	0.57	0.28	5U	2.63	0.07	8.7	3.2	0.57
	10/15/09	0.81	0.5U	0.003U	0.003U	0.41	0.22	5U	3.58	0.05U	0.94	3.4	0.3U
	11/03/09	0.49	0.5U	0.003U	0.003U	0.64	0.38	5U	3.07	0.026J	0.79	3.8	0.73
	12/02/09	4.68	0.5U	0.003U	0.0022J	0.86	0.52	5U	2.78	0.05U	1.2J	3.6	0.82
	01/06/10	4.40	0.5U	0.0025J	0.003U	1	0.48	5.3	3.08	0.05U	1.1	3.8	0.72
	02/03/10	2.61	0.5U	0.003U	0.003U	1	0.44	5U	3.46	0.05U	1.1	4.2	0.74
	03/08/10	7.44	0.5U	0.003U	0.003U	0.65	0.34	5U	2.52	0.05U	0.95	2.9	0.38
	04/13/10	13.57	0.5U	0.0025J	0.003U	1.2J	0.58	5U	1.7	0.05U	0.92	2.2	0.5
	05/05/10	2.36	0.5U	0.003U	0.0023J	1.1	0.54	5U	1.98	0.05U	0.86	2.6	0.62
	06/09/10	1.15	0.5U	0.003U	0.003U	1.1	0.45	5U	1.25	0.09	1.3	1.7	0.45
	07/07/10	0.49	0.5U	0.0025J	0.003U	1	0.36	5U	0.21	0.034J	1.1	0.7	0.49
	08/04/10	0.55	0.5U	0.003U	0.003U	0.57	0.2	5U	0.143	0.027J	0.79	0.44	0.3
	09/09/10*	1.55	0.5U	0.003U	0.003U	0.42	0.16	8.5	0.278	0.74	0.06	0.61	0.33

Notes:

- Prior to the 12/02/09 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report.
- Between the 12/02/09 and 03/08/10 baseflow events, flow was calculated based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- Flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.
- Due to equipment limitations (i.e., internal memory loss due to temperatures below operating range) the flow value shown on 02/03/10 was estimated based on stage observed on the staff gauge at the time of the baseflow sampling event.

cfs = cubic feet per second
µg/l = micrograms per liter
mg/l = milligrams per liter
TSS = Total Suspended Solids
TKN = Total Kjeldahl Nitrogen
NC = Not Calculated
-- = Sample not analyzed for this compound
J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated.
U = Compound or sample not detected; value shown is reporting limit
NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)
* = Not yet validated

Table 2d
Baseflow Laboratory Analytical Results for SW-02-TT (HBHA Pond Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan													
SW-4	08/29/00	NC	--	0.0211	0.0031U	1.15	--	5U	--	--	--	--	--
	10/05/00	NC	--	0.0131	0.0025U	0.966	--	5U	--	--	--	--	--
	04/05/01	NC	--	0.0069J	0.0112J	1.05	--	5U	--	--	--	--	--
Multiple Source Groundwater Response Plan													
SW-02-TT	07/14/01	NC	--	0.0217	0.0096J	2.28	1.12	4.3	--	--	--	--	--
	08/23/01	NC	--	0.0209	0.0058U	1.6J	0.349	4.6	--	--	--	--	--
	09/18/01	NC	--	0.0173	0.0045	1.1	0.114U	5.6J	--	--	--	--	--
	10/22/01	NC	--	0.0312	0.0032J	2.23	0.159	5.6	--	--	--	--	--
	11/19/01	NC	--	0.0431	0.004J	3.51J	0.0472	12.8J	--	--	--	--	--
	12/17/01	NC	--	0.0235	0.0045J	2.82J	0.0992J	9.6	--	--	--	--	--
	01/04/02	NC	--	0.0118	0.0055J	1.53	0.193U	1.6	--	--	--	--	--
	02/15/02	NC	--	0.0119	0.005	1.79	0.309	4J	--	--	--	--	--
	03/12/02	NC	--	0.0205	0.0079	2.21	0.548	5.8J	--	--	--	--	--
	04/17/02	NC	--	0.0113	0.0061	1.41J	0.706	3.2	--	--	--	--	--
	05/08/02	NC	--	0.0122	0.008	1.66	0.952	3J	--	--	--	--	--
	06/20/02	NC	--	0.0136U	0.0065U	1.85	0.676	4.4J	--	--	--	--	--
	07/16/02	NC	--	0.0232	0.0031	1.84	0.042U	4.4	--	--	--	--	--
	08/06/02	NC	--	0.0281	0.0044	1.91	0.0509U	6.6J	--	--	--	--	--
	09/10/02	NC	--	0.0168	0.0024UJ	1.36	0.0407U	2.8J	--	--	--	--	--
10/25/02	NC	--	0.0236	0.0054J	1.82	0.351	4UJ	--	--	--	--	--	
Remedial Design "Early Action"													
SW-02-TT	08/21/08	NM	0.5U	0.029	0.006	--	--	5U	7.73	0.1	0.76	8.2	0.47
	09/18/08	NM	0.5U	0.021	0.005U	--	--	5U	6.01	0.08	0.82	6.8	0.79
	10/09/08	NM	0.5U	0.019	0.0048J	--	--	5U	5.39	0.07	0.81	6.2	0.81
	11/05/08	8.44	0.5U	0.02	0.005	--	--	5U	5.52J	0.05U	0.57	6.3	0.78
	12/09/08	5.49	0.34J	0.017	0.009	--	--	5U	5.51	0.01J	0.88	6	0.49
	01/20/09	NM	0.5U	0.009	0.004	--	--	5U	4.11	0.027J	0.99	4.6	0.49
	02/02/09	~5	0.28J	0.015	0.011	--	--	5U	3.93	0.07	0.98	4.4	0.47
	03/18/09	NM	0.9	0.015	0.01	--	--	5U	4.6	0.05U	0.96	5.6	1
	04/01/09	~6	0.7	0.014	0.007	--	--	5U	3.51	0.05U	0.79	4.7	1.2
	Surface Water Monitoring Plan												
SW-02-TT	04/17/09	8.62	0.46J	0.015	0.006	1.4	0.2	5U	4.12	0.05U	1	5.9	1.8
	05/12/09	4.27	0.27J	0.017	0.006	1.9	0.33	5U	4.93	0.043J	0.7	5.6	0.67
	06/02/09	0.90	0.5U	0.018	0.008	1.4	0.06	5U	5.87	0.14	0.78	6.6	0.73
	07/15/09	2.10	0.5U	0.014	0.01	1.6	0.97	5U	3.69	0.07	0.82	4.6	0.91
	08/05/09	2.44	0.5U	0.009	0.007	1.7	0.84	5U	3.03	0.07	0.82	3.7	0.67
	09/02/09	0.91	0.5U	0.016	0.006	1.3	0.43	5U	4.94	0.05	0.49	5.4	0.46
	10/15/09	1.35	0.5U	0.016	0.006	1.2	0.28	5U	6.55	0.03J	0.62	7.4	0.85
	11/03/09	13.54	0.5U	0.018	0.01	1.4	0.63	5.7	5.03	0.05U	0.8	5.6	0.57
	12/02/09	7.26	0.41J	0.014	0.01	1.3	0.69	5U	3.65	0.05U	0.71	4.3	0.65
	01/06/10	8.45	0.5U	0.01	0.005	1.2	0.48	5U	3.35	0.05U	0.98	3.9	0.55
	02/03/10	7.26	0.5U	0.009	0.006	1.1	0.55	5U	3.23	0.05U	1	3.7	0.47
	03/08/10	9.74	0.25J	0.012	0.009	1.1	0.56	5U	3.86	0.05U	1.1	4.3	0.44
	04/13/10	8.34	0.5U	0.012	0.007	1.4J	0.64	5U	2.79	0.05U	0.86	3.3	0.51
	05/05/10	4.12	0.5U	0.013	0.006	1.2	0.36	5U	4.15	0.032J	0.88	4.8	0.65
	06/09/10	2.89	0.5U	0.016	0.01U	1.2	0.64	5U	8.17	0.08	0.75	8.6	0.43
	07/07/10	1.11	0.5U	0.025	0.011	1.1	0.24	5U	15.8	0.07	0.67	16	0.3U
	08/04/10	1.14	0.5U	0.026	0.012	0.93	0.18	5U	16.8	0.05	0.45	17	0.3U
	09/09/10*	2.02	0.5U	0.022	0.008	1.1	0.34	16	7.82	0.47	0.05	6.9	0.3U

Notes:

- Prior to the 12/02/09 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report.
- Between the 12/02/09 and 03/08/10 baseflow events, flow was calculated based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- Flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.

HBHA = Halls Brook Holding Area

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NC = Not Calculated

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimate

NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)

* = Not yet validated

Table 2c
Baseflow Laboratory Analytical Results for SW-04-TT (HBHA Wetland Outlet)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Groundwater & Surface Water Investigation Plan													
SW-9	08/29/00	NC	--	0.0235	0.0031U	2.77	--	8.5	--	--	--	--	--
	10/05/00	NC	--	0.0126	0.0123	1.54	--	5U	--	--	--	--	--
	04/05/01	NC	--	0.0035U	0.0038J	0.883	--	5U	--	--	--	--	--
Multiple Source Groundwater Response Plan													
SW-04-TT	07/14/01	NC	--	0.023	0.0101J	3.09	1.6	4.5	--	--	--	--	--
	08/23/01	NC	--	0.0501	0.014	6.14J	0.616	20.4	--	--	--	--	--
	09/18/01	NC	--	0.0246	0.005	3.3	0.14U	54.4J	--	--	--	--	--
	10/22/01	NC	--	0.0193	0.0031J	2.72	0.121	6.4	--	--	--	--	--
	11/19/01	NC	--	0.0649	0.005J	9.66J	0.0666	109J	--	--	--	--	--
	12/17/01	NC	--	0.171	0.0049J	27.9J	0.109J	85	--	--	--	--	--
	01/04/02	NC	--	0.0242	0.0044J	3.84	0.361	9	--	--	--	--	--
	02/15/02	NC	--	0.0251	0.0037J	3.9	0.409	8.2J	--	--	--	--	--
	03/12/02	NC	--	0.0166	0.006	2.1	0.626	4.8J	--	--	--	--	--
	04/17/02	NC	--	0.0135	0.0077U	1.88J	0.741	5.2	--	--	--	--	--
	05/08/02	NC	--	0.0086	0.0082	1.28	1.2	5.3J	--	--	--	--	--
	06/20/02	NC	--	0.0238	0.0093U	3.73	1.34	4J	--	--	--	--	--
	07/16/02	NC	--	0.0396	0.0062	4.52	0.0484U	12.6	--	--	--	--	--
	08/06/02	NC	--	0.0368	0.009	3.8	0.0791U	13.6J	--	--	--	--	--
	09/10/02	NC	--	0.0314	0.0052U	3.64	0.0356U	9.2J	--	--	--	--	--
10/25/02	NC	--	0.0207	0.0045J	2.76	0.447	8.6J	--	--	--	--	--	
Remedial Design "Early Action"													
SW-04-TT	08/21/08	NM	0.5U	0.025	0.007	--	--	5U	6.92	0.12	0.8	7.3	0.38
	09/18/08	NM	0.5U	0.022	0.005J	--	--	5U	5.29	0.09	0.8	5.7	0.41
	10/09/08	NM	0.5U	0.02	0.003J	--	--	5U	5.18	0.09	0.95	5.7	0.52
	11/05/08	NM	0.5U	0.018	0.006	--	--	5U	6.22J	0.047J	0.65	7.2	0.98
	12/09/08	5.80	0.5U	0.023	0.007	--	--	5U	5.36	0.01J	0.8	6	0.64
	01/20/09	6.41	0.5U	0.02	0.008	--	--	5.3	4.44	0.05U	0.94	5.1	0.66
	02/02/09	6.63	0.5U	0.013	0.008	--	--	5U	3.71	0.029J	0.92	4.4	0.69
	03/18/09	6.02	0.5U	0.012	0.005	--	--	5U	4.08	0.05U	0.95	5	0.92
	04/01/09	6.17	0.46J	0.012	0.006	--	--	5U	3.72	0.05U	0.74	4.5	0.78
	Surface Water Monitoring Plan												
SW-04-TT	04/17/09	5.56	0.5U	0.016	0.006	--	--	5U	3.83	0.05U	0.96	4.6	0.77
	05/12/09	4.13	0.5U	0.018	0.004	--	--	5U	3.87	0.06	0.75	4.7	0.83
	06/02/09	3.42	0.5U	0.018	0.009	--	--	5U	5.12	0.049J	0.9	6	0.88
	07/15/09	4.37	0.5UJ	0.021	0.005	--	--	6	2.67	0.15	0.76	3.3	0.63
	08/05/09	4.47	0.5U	0.017	0.012	--	--	5U	2.27	0.22	1	2.8	0.53
	09/02/09	3.36	0.5U	0.012	0.007	--	--	5U	3.7	0.13	0.76	4	0.3
	10/15/09	3.06	0.5U	0.013	0.004	--	--	5U	6.06	0.027J	0.96	6.6	0.54
	11/03/09	2.78	0.5U	0.013	0.008	--	--	5U	4.23	0.026J	0.66	4.8	0.57
	12/02/09	3.77	0.26J	0.013	0.008	--	--	5U	3.83	0.05U	0.71	4.1	0.3U
	01/06/10	6.23	0.5U	0.023	0.007	--	--	5U	3.41	0.05U	0.95	4	0.59
	02/03/10	6.73	0.5U	0.009	0.005	--	--	5U	3	0.05U	1.1	3.5	0.5
	03/08/10	8.79	0.5U	0.009	0.008	--	--	5U	3.57	0.05U	1	3.9	0.33
	04/13/10	9.02	0.5U	0.013	0.007	--	--	5U	2.56	0.028J	0.89	3.2	0.64
	05/05/10	4.59	0.5U	0.015	0.008	--	--	5U	3.64	0.05	0.97	4.2	0.56
	06/09/10	2.55	0.5U	0.023	0.009U	--	--	6.6	6.25	0.11	0.6	6.7	0.45
	07/07/10	1.03	0.5U	0.025	0.012	--	--	16	12.1	0.64	0.96	11	0.3U
	08/04/10	4.35	0.5U	0.03	0.016	--	--	6.9	10.6	0.33	1.2	12	1.4
	09/09/10*	2.51	0.5U	0.021	0.007	--	--	5U	5.66	0.67	0.19	6	0.34

Notes:
• Prior to the 12/02/09 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report; flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
• Due to damage to the "scissor-ring" mount for the Isco 750 area-velocity module sensor during the 03/13-16/10 storm event, the flow values shown on April 13, 2010, May 5, 2010, June 9, 2010 and July 7, 2010 were estimated based on stage observed on the staff gauge at the time of the respective baseflow sampling events.

HBHA = Halls Brook Holding Area
cfs = cubic feet per second
µg/l = micrograms per liter
mg/l = milligrams per liter
TSS = Total Suspended Solids
TKN = Total Kjeldahl Nitrogen
NC = Not Calculated
-- = Sample not analyzed for this compound
U = Compound or sample not detected; value shown is reporting limit
J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimate
NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)
* = Not yet validated

Table 2f
Baseflow Laboratory Analytical Results for SW-03-TT (Aberjona)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan													
SW-03-TT	07/14/01	NC	--	0.0129	0.0096J	1.94	1.12	3.6	--	--	--	--	--
	08/23/01	NC	--	0.0184	0.0104U	1.83J	0.568	3.6	--	--	--	--	--
	09/18/01	NC	--	0.0281	0.0179	3.13	1.46	6.4J	--	--	--	--	--
	10/22/01	NC	--	0.018	0.0136	2.13	0.985	4.8	--	--	--	--	--
	11/19/01	NC	--	0.032	0.0242	3.53J	2.43	10.4J	--	--	--	--	--
	12/17/01	NC	--	0.029	0.0224	3.32J	1.97	6	--	--	--	--	--
	01/04/02	NC	--	0.0278	0.019	3.42	2.11	10.6	--	--	--	--	--
	02/15/02	NC	--	0.0128	0.0118	1.63	1.14	1.4J	--	--	--	--	--
	03/12/02	NC	--	0.0066	0.0076	1.04	0.935	1.4J	--	--	--	--	--
	04/17/02	NC	--	0.0071U	0.0058U	1.16J	0.78	2.1	--	--	--	--	--
	05/08/02	NC	--	0.0135	0.0065	2.57	0.773	2J	--	--	--	--	--
	06/20/02	NC	--	0.0111U	0.0057U	1.82	0.778	4UJ	--	--	--	--	--
	07/16/02	NC	--	0.0246	0.0134	3.07	1.11	5.2	--	--	--	--	--
	08/06/02	NC	--	0.0325	0.0147	3.16	0.682	7J	--	--	--	--	--
08/31/02	NC	--	0.0195	0.0037UJ	1.73	0.14U	8.8J	--	--	--	--	--	
09/10/02	NC	--	0.0348	0.0161	3.57	1.31	5.4J	--	--	--	--	--	
10/25/02	NC	--	0.0072	0.006	1.15	0.683	3J	--	--	--	--	--	
Surface Water Monitoring Plan													
SW-03-TT	04/17/09	8.58	0.5U	0.006	0.004	--	--	5U	0.778	0.06	1.6	1.2	0.42
	05/12/09	8.15	0.5U	0.006	0.004	--	--	5U	0.905	0.13	1.3	1.6	0.7
	06/02/09	3.82	0.5U	0.008	0.006	--	--	5U	1.72	0.43	1.5	2.2	0.48
	07/15/09	0.85	0.5UJ	0.007	0.011	--	--	5U	0.837	0.38	2	0.83	0.3U
	08/05/09	3.63	0.5U	0.007	0.006	--	--	5U	0.572	0.24	2.3	1.2	0.63
	09/02/09	0.23	0.5U	0.006	0.005	--	--	5U	0.532	0.14	2	0.92U	0.39
	10/15/09	0.25	0.5U	0.005	0.006	--	--	5U	0.724	0.06	2.4	1.1	0.38
	11/03/09	0.23	0.5U	0.007	0.005	--	--	5U	0.804	0.097	2.5	1.3	0.5
	12/02/09	0.30	0.5U	0.006	0.005	--	--	5U	0.65	0.048J	8.9	1.4	0.75
	01/06/10	0.20	0.5U	0.007	0.006	--	--	5U	2.31	0.038J	1.3	2.7	0.39
	02/03/10	NM	0.5U	0.006	0.006	--	--	5U	1.69	0.025J	1.3	2	0.31
	03/08/10	0.46	0.5U	0.004	0.005	--	--	5U	1.02	0.05U	1.1	1.3	0.28J
	04/13/10	4.78	0.5U	0.003	0.004	--	--	5U	0.813	0.049J	1.1	1.2	0.39
	05/05/10	1.93	0.5U	0.009	0.007	--	--	5U	1.21	0.1	1.5	1.7	0.49
	06/09/10	1.15	0.5U	0.008	0.007U	--	--	5U	1.73	0.22	1.4	2.1	0.37
	07/07/10	0.77	0.5U	0.022	0.004	--	--	7.8	1.46	0.42	2.5	1.8	0.34
	08/04/10	0.46	0.5U	0.015	0.004	--	--	5U	0.964	0.06	3.4	1.2	0.3U
	09/09/10*	0.99	0.5U	0.012	0.007	--	--	5U	1.28	1.9	0.12	1.5	0.3U

Notes:

• Prior to the 03/08/10 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report; flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NC = Not Calculated

-- = Sample not analyzed for this compound

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated.

U = Compound or sample not detected; value shown is reporting limit

NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)

* = Not yet validated

Table 2g
Baseflow Laboratory Analytical Results for SW-05-TT (Salem Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan													
SW-05-TT	07/14/01	NC	--	0.0218	0.0114J	2.88	1.48	4.5	--	--	--	--	--
	08/23/01	NC	--	0.0261	0.013U	2.46J	0.522	2	--	--	--	--	--
	09/18/01	NC	--	0.0191	0.0043	2.27	0.254	6.4J	--	--	--	--	--
	10/22/01	NC	--	0.0197	0.0072	2.23	0.373	5.2	--	--	--	--	--
	11/19/01	NC	--	0.0238	0.0057J	3.05J	0.134	10J	--	--	--	--	--
	12/17/01	NC	--	0.0248	0.0102	2.93J	0.66	9.2	--	--	--	--	--
	01/04/02	NC	--	0.0195	0.0077	2.71	0.83	7.6	--	--	--	--	--
	02/15/02	NC	--	0.0142	0.0047J	2.04	0.489	5.4J	--	--	--	--	--
	03/12/02	NC	--	0.0091	0.0046	1.46	0.659	2.6J	--	--	--	--	--
	04/17/02	NC	--	0.0158	0.0064U	1.94J	0.511	7.3	--	--	--	--	--
	05/08/02	NC	--	0.013	0.0061	2.17	0.865	5.8J	--	--	--	--	--
	06/20/02	NC	--	0.0239	0.0072U	3.46	0.927	6.4J	--	--	--	--	--
	07/16/02	NC	--	0.028	0.0038	3.02	0.0238U	5.4	--	--	--	--	--
	08/06/02	NC	--	0.0241	0.0044	1.95	0.0089UJ	6.8J	--	--	--	--	--
	08/31/02	NC	--	0.0126	0.0025U	1.16	0.0884U	3J	--	--	--	--	--
09/10/02	NC	--	0.0238	0.0052U	2.44	0.0087U	5.2J	--	--	--	--	--	
10/25/02	NC	--	0.0143	0.0041J	2.15	0.657	5.6J	--	--	--	--	--	
Surface Water Monitoring Plan													
SW-05-TT	04/17/09	48.55	0.5U	0.009	0.003	--	--	5U	2.09	0.048J	1.3	3.1	1
	05/12/09	48.94	0.5U	0.012	0.003	--	--	5U	2.18	0.08	1	2.7	0.52
	06/02/09	33.94	0.5U	0.014	0.006	--	--	5U	2.88	0.13J	1.2	3.6	0.72
	07/15/09	9.47	0.5UJ	0.011	0.006	--	--	5U	1.23	0.25	1.3	1.6	0.37
	08/05/09	10.07	0.5U	0.009	0.005	--	--	5U	0.366	0.2	2.1	1.1	0.73
	09/02/09	4.81	0.5U	0.008	0.005	--	--	5U	0.664	0.2	2	1.1U	0.44
	10/15/09	14.28	0.5U	0.008	0.003	--	--	5U	2.88	0.042J	1.9	3	0.3U
	11/03/09	19.28	0.5U	0.009	0.004	--	--	5U	2.24	0.046J	1.4	2.9	0.66
	12/02/09	24.62	0.5U	0.008	0.006	--	--	5U	2.16	0.031J	1.2	2.5	0.34
	01/06/10	NM	0.5U	0.017	0.006	--	--	15	2.74	0.05U	1.2	3.2	0.46
	02/03/10	26.46	0.5U	0.011	0.006	--	--	5U	2.18	0.05U	1.2	2.6	0.42
	03/08/10	58.50	0.5U	0.006	0.004	--	--	5U	2.1	0.05U	1.2	2.2	0.3U
	04/13/10	28.72	0.5U	0.007	0.004	--	--	5U	1.43	0.034J	1.1	1.8	0.37
	05/05/10	19.33	0.5U	0.014	0.008	--	--	5U	2.16	0.07	1.1	2.7	0.54
	06/09/10	7.45	0.5U	0.022	0.007U	--	--	7.8	3.47	0.14	1.1	4.2	0.73
	07/07/10	3.58	0.5U	0.026	0.009	--	--	13	3.96	0.29	1.6	4.1	0.3U
	08/04/10	3.21	0.5U	0.016	0.006	--	--	8.4	5.19	0.3	2.4	5.7	0.51
	09/09/10*	2.69	0.5U	0.018	0.006	--	--	6.8	3.6	1.1	0.22	4.1	0.5

Notes:

- Prior to the 05/05/10 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report; flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.
- Due to damage to the area-velocity sensor, the flow value shown on September 9, 2010 was estimated based on stage observed on the staff gauge at the time of the baseflow sampling event.

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NC = Not Calculated

-- = Sample not analyzed for this compound

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimate

U = Compound or sample not detected; value shown is reporting limi

NM = Not measured (e.g., insufficient flow and/or due to equipment limitations)

* = Not yet validated

Table 2h
Baseflow Laboratory Analytical Results for SW-06-TT (Montvale Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan													
SW-06-TT	07/14/01	NC	--	0.0147	0.0071J	2.05	0.961	4.2	--	--	--	--	--
	08/23/01	NC	--	0.015	0.008U	1.4J	0.355	4.8	--	--	--	--	--
	09/18/01	NC	--	0.0101	0.0029	1.08	0.14U	3.6J	--	--	--	--	--
	10/22/01	NC	--	0.0189	0.003U	2.6	0.355	15.6	--	--	--	--	--
	11/19/01	NC	--	0.018	0.003U	2.56J	0.11	6.4J	--	--	--	--	--
	12/17/01	NC	--	0.0112	0.0043J	1.3J	0.19J	3.6	--	--	--	--	--
	01/04/02	NC	--	0.01	0.003U	1.52	0.254U	3	--	--	--	--	--
	02/15/02	NC	--	0.0092	0.0029J	1.31	0.277	3.4J	--	--	--	--	--
	03/12/02	NC	--	0.0055	0.0021J	0.982	0.431	2.2J	--	--	--	--	--
	04/17/02	NC	--	0.0038	0.004U	0.359J	0.32	5.2	--	--	--	--	--
	05/08/02	NC	--	0.0066	0.004	1.35	0.5	4.6J	--	--	--	--	--
	06/20/02	NC	--	0.0148	0.0026UJ	2.18	0.588	4.4J	--	--	--	--	--
	07/16/02	NC	--	0.0133	0.0013U	1.51	0.0276U	5	--	--	--	--	--
	08/06/02	NC	--	0.0112	0.0028	1.01	0.0098UJ	3.3J	--	--	--	--	--
09/10/02	NC	--	0.0084	0.0016UJ	1.11	0.0087U	3.2J	--	--	--	--	--	
10/25/02	NC	--	0.0076	0.0033J	1.09	0.375	2UJ	--	--	--	--	--	
Surface Water Monitoring Plan													
SW-06-TT	04/17/09	9.09	0.5U	0.008	0.005	--	--	5U	1.38	0.07	1.5	2.9	1.5
	05/12/09	13.25	0.5U	0.009	0.0027J	--	--	5U	1.43	0.08	1.3	2.7	1.3
	06/02/09	6.18	0.5U	0.01	0.004	--	--	5U	1.8	0.14	1.6	2.4	0.6
	07/15/09	3.74	0.5UJ	0.01	0.005	--	--	5U	0.591	0.2	1.6	1	0.41
	08/05/09	5.51	0.5U	0.009	0.0026J	--	--	5U	0.181	0.07	2	0.78	0.6
	09/02/09	0 [†]	0.5U	0.005	0.004	--	--	5U	0.22	0.12	2	0.49U	0.3U
	10/15/09	1.44	0.5U	0.004	0.0023J	--	--	5U	1.73	0.041J	1.6	2	0.3U
	11/03/09	4.70	0.5U	0.006	0.0029J	--	--	5U	1.46	0.039J	1.5	1.9	0.44
	12/02/09	20.03	0.5U	0.004	0.005	--	--	5U	1.65	0.05U	1.3	1.5	0.3U
	01/06/10	11.80	0.5U	0.011	0.005	--	--	5.3	2.03	0.035J	1.3	2.3	0.27J
	02/03/10	12.67	0.5U	0.005	0.0025J	--	--	5U	1.59	0.05U	1.4	2	0.41
	03/08/10	25.83	0.5U	0.004	0.003U	--	--	5U	1.42	0.05U	1.3	1.7	0.28J
	04/13/10	0 [†]	0.5U	0.006	0.004	--	--	5U	0.946	0.032J	1.2	1.3	0.35
	05/05/10	0 [†]	0.5U	0.01	0.006	--	--	5U	1.26	0.06	1.3	1.9	0.64
	06/09/10	1.49	0.5U	0.012	0.005U	--	--	5U	2.08	0.22	1.4	2.6	0.52
	07/07/10	2.70	0.5U	0.01	0.0028J	--	--	5.1	2.9	0.39	2.7	3	0.3U
	08/04/10	1.79	0.5U	0.008	0.004	--	--	5U	0.705	0.24	3.8	1.1	0.4
09/09/10*	3.87	0.5U	0.01	0.004	--	--	8.9	2.17	1.8	0.23	2.3	0.3U	

Notes:

• Prior to the 05/05/10 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report; flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NC = Not Calculated

-- = Sample not analyzed for this compound

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimatec

U = Compound or sample not detected; value shown is reporting limi

[†] Based on TTNUS rating curve, flow was 0 cfs; however, Roux Associates observed flow at the time of sampling.

* = Not yet validated

Table 2i
Baseflow Laboratory Analytical Results for SW-07-TT (Swanton Street)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan													
SW-07-TT	07/14/01	NC	--	0.0094UJ	0.0045J	1.46	0.699	50	--	--	--	--	--
	08/23/01	NC	--	0.0109U	0.0047U	1.01J	0.254J	4.6	--	--	--	--	--
	09/18/01	NC	--	0.0063	0.0015J	1.02	0.139U	2.8J	--	--	--	--	--
	10/22/01	NC	--	0.0056J	0.003U	0.951	0.243	4U	--	--	--	--	--
	11/19/01	NC	--	0.0047J	0.003U	0.779J	0.143	1.2J	--	--	--	--	--
	12/17/01	NC	--	0.0053J	0.003U	1.06J	0.316J	3	--	--	--	--	--
	01/04/02	NC	--	0.0057J	0.003U	1.08	0.163U	2.4	--	--	--	--	--
	02/15/02	NC	--	0.0066	0.0024J	1.2	0.249	7.6J	--	--	--	--	--
	03/12/02	NC	--	0.0041	0.0017U	0.887	0.331	8.4J	--	--	--	--	--
	04/17/02	NC	--	0.0075	0.0037	1.21J	0.371	5.2	--	--	--	--	--
	05/08/02	NC	--	0.0061	0.0023J	1.24	0.394	7J	--	--	--	--	--
	06/20/02	NC	--	0.0105U	0.0034UJ	1.8	0.396	10J	--	--	--	--	--
	07/16/02	NC	--	0.0065	0.0013U	1.13	0.0229U	4	--	--	--	--	--
	08/06/02	NC	--	0.0083	0.0033	1.18	0.018U	3.5J	--	--	--	--	--
	08/31/02	NC	--	0.0048J	0.0025U	0.777	0.0495U	6J	--	--	--	--	--
09/10/02	NC	--	0.0079U	0.0035U	1.05	0.0156UJ	2.2J	--	--	--	--	--	
10/25/02	NC	--	0.0048J	0.003U	0.978	0.373	5.2J	--	--	--	--	--	
Surface Water Monitoring Plan													
SW-07-TT	04/17/09	90.86	0.5U	0.005	0.002J	--	--	5U	0.787	0.05	1.7	1.2	0.41
	05/12/09	84.97	0.5U	0.008	0.0026J	--	--	5U	0.706	0.1	1.5	1.5	0.79
	06/02/09	73.67	0.5U	0.008	0.005	--	--	8	0.638	0.22	2	1.2	0.56
	07/15/09	29.81	0.5UJ	0.007	0.004	--	--	5U	0.263	0.13	1.8	0.81	0.55
	08/05/09	29.92	0.5U	0.005	0.004	--	--	5U	0.234	0.036J	2	1.2	0.97
	09/02/09	29.21	0.5U	0.004	0.003	--	--	5U	0.209	0.07	2	0.62U	0.41
	10/15/09	28.47	0.5U	0.003	0.003U	--	--	5U	1.03	0.09	1.9	1.3	0.3U
	11/03/09	30.32	0.5U	0.002J	0.003U	--	--	5U	0.863	0.06	1.8	1.4	0.54
	12/02/09	22.07	0.5U	0.004	0.003	--	--	5U	1.11	0.032J	1.6	1.6	0.49
	01/06/10	3.82	0.5U	0.006	0.0028J	--	--	5U	1.52	0.05U	1.5	1.7	0.18J
	02/03/10	44.17	0.5U	0.005	0.0021J	--	--	5U	1.13	0.05U	1.5	1.4	0.27J
	03/08/10	64.59	0.5U	0.003	0.003	--	--	5U	0.98	0.028J	1.5	1.2	0.22J
	04/13/10	3.87	0.5U	0.003	0.003U	--	--	5U	0.609	0.033J	1.2	0.91	0.3
	05/05/10	18.84	0.5U	0.008	0.005	--	--	5U	0.633	0.08	1.6	1.4	0.77
	06/09/10	19.90	0.5U	0.007	0.003U	--	--	7.3	0.882	0.28	1.9	1.6	0.72
	07/07/10	18.23	0.5U	0.004	0.0024J	--	--	5U	0.501	0.19	3.4	0.84	0.34
	08/04/10	16.13	0.5U	0.005	0.0023J	--	--	5U	0.422	0.07	2.9	0.76	0.34
	09/09/10*	32.14	0.5U	0.006	0.003	--	--	5U	0.286	1.5	0.08	0.7	0.41

Notes:

- Prior to the 05/05/10 baseflow event, flow was calculated shown are based on the rating curves reported by TTNUS in the MSGRP RI Report; flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 5.
- Due to damage to the area-velocity sensor, the flow value shown on September 9, 2010 was estimated based on stage observed on the staff gauge at the time of the baseflow sampling event.

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NC = Not Calculated

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limi

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimatec

* = Not yet validated

Table 2j
Baseflow Laboratory Analytical Results for SW-08-TT (USGS / Mystic Avenue)
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Flow (cfs)	Benzene (µg/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Dissolved Iron (mg/l)	TSS (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	Total Organic Nitrogen (mg/l)
Multiple Source Groundwater Response Plan													
SW-08-TT	07/14/01	NC	--	0.006UJ	0.0022J	1.36	0.558	6.1	--	--	--	--	--
	08/23/01	NC	--	0.0059U	0.005U	1J	0.258J	4.8	--	--	--	--	--
	09/18/01	NC	--	0.0047	0.0018J	0.696	0.234	3.8J	--	--	--	--	--
	10/22/01	NC	--	0.0026J	0.003U	0.758	0.256	4U	--	--	--	--	--
	11/19/01	NC	--	0.0054J	0.003U	1.57J	0.186	2.4J	--	--	--	--	--
	12/17/01	NC	--	0.0066J	0.003J	0.77J	0.19J	2J	--	--	--	--	--
	01/04/02	NC	--	0.0056J	0.003U	1.06	0.104U	9	--	--	--	--	--
	02/15/02	NC	--	0.0053J	0.0024U	0.95	0.209	3.1J	--	--	--	--	--
	03/12/02	NC	--	0.0025J	0.0017U	0.76	0.227	7J	--	--	--	--	--
	04/17/02	NC	--	0.0057	0.0032	1.02J	0.378	5.1	--	--	--	--	--
	05/08/02	NC	--	0.0034J	0.0016J	1.15	0.312	7.7J	--	--	--	--	--
	06/20/02	NC	--	0.0048U	0.0021UJ	1.19	0.272	4J	--	--	--	--	--
	07/16/02	NC	--	0.0052	0.0013U	1.06	0.0216U	3.3	--	--	--	--	--
	08/06/02	NC	--	0.0064	0.0021J	0.596	0.0206U	3.4J	--	--	--	--	--
09/10/02	NC	--	0.003U	0.0013U	0.896	0.0087U	2.6J	--	--	--	--	--	
10/25/02	NC	--	0.003U	0.003U	0.868	0.34	2.5J	--	--	--	--	--	
Surface Water Monitoring Plan													
SW-08-TT	04/17/09	206.90	0.5U	0.005	0.003U	--	--	6.5	0.48	0.05	1.4	0.96	0.48
	05/12/09	126.00	0.5U	0.005	0.003U	--	--	5U	0.42	0.09	1.3	1	0.58
	06/02/09	108.51	0.5U	0.007	0.0026J	--	--	5U	0.528	0.14	1.7	1.1	0.57
	07/15/09	143.70	0.5UJ	0.005	0.003	--	--	5U	0.186U	0.1	1.2	0.99	0.8
	08/05/09	142.17	0.5U	0.003	0.0023J	--	--	5U	0.203	.033J	1.3	0.77	0.57
	09/02/09	6.39	0.5U	0.005	0.003	--	--	5U	0.258	0.08	1.6	0.66U	0.4
	10/15/09	8.73	0.5U	0.0028J	0.003U	--	--	5U	0.743	0.07	1.5	1.3	0.56
	11/03/09	10.06	0.5U	0.0024J	0.003U	--	--	5U	0.8	0.048J	1.4	0.92	0.3U
	12/02/09	24.82	0.5U	0.005	0.003U	--	--	5U	0.869	0.033J	1.2	1.4	0.53
	01/06/10	53.64	0.5U	0.003	0.003U	--	--	5U	0.78	0.05U	0.98	0.8	0.3U
	02/03/10	46.73	0.5U	0.004	0.003U	--	--	5U	0.64	0.027J	1.4	1.2	0.56
	03/08/10	165.15	0.5U	0.0022J	0.003U	--	--	5U	0.567	0.025J	1.4	0.9	0.33
	04/13/10	96.13	0.5U	0.0028J	0.003U	--	--	5U	0.34	0.031J	1.1	0.66	0.32
	05/05/10	22.08	0.5U	0.004	0.0024J	--	--	5.3	0.446	0.07	1.5	1.2	0.75
	06/09/10	1.67	0.5U	0.006	0.004U	--	--	5U	0.915	0.19	1.5	1.4	0.48
	07/07/10	6.40	0.5U	0.004	0.003U	--	--	8.5	0.32	0.11	2.3	0.59	0.3U
	08/04/10	1.80	0.5U	0.0023J	0.003U	--	--	5U	0.158	0.049J	2.2	0.47	0.31
	09/09/10*	9.07	0.5U	0.003U	0.003U	--	--	5U	0.182	1.9	0.08	0.75	0.57

Notes:

- Prior to the 12/02/09 baseflow event, flow was calculated based on the rating curves reported by TTNUS in the MSGRP RI Report; flows are currently based on the station-specific rating curve reported in the Quarterly Storm Flow Surface Water Monitoring Report No. 2.
- Due to equipment power failure, the flow value shown on 05/05/10 and 06/09/10 was estimated based on stage observed on the staff gauge at the time of the baseflow sampling event.
- Due to damage to the area-velocity sensor, the flow value shown on August 4, 2010 was estimated based on stage observed on the staff gauge at the time of the baseflow sampling event.

USGS = United States Geologic Survey

cfs = cubic feet per second

µg/l = micrograms per liter

mg/l = milligrams per liter

TSS = Total Suspended Solids

TKN = Total Kjeldahl Nitrogen

NC = Not Calculated

-- = Sample not analyzed for this compound

U = Compound or sample not detected; value shown is reporting limit

J = Analyte concentration is below quantitation limit, but greater than or equal to 1/2 the laboratory detection limit. Value is estimated.

* = Not yet validated

Table 3
Relative Surface Water and Groundwater Elevations at Time of Baseflow Sampling
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station ID	Station Description	Date ¹	Surface Water			Groundwater			Gradient
			Measuring Point ² (ft)	Staff Gage Reading (ft)	Surface Water Elevation ³ (ft)	Measuring Point ⁴ (ft)	Depth to Water (ft)	Groundwater Elevation ³ (ft)	
SW-2-IP	AAD	05/12/09	92.34	0.49	92.83	95.16	3.50	91.66	Down
		06/02/09	92.34	0.02	92.36	95.16	4.09	91.07	Down
		07/15/09	92.34	0.50	92.84	95.16	3.45	91.71	Down
		08/05/09	92.34	0.60	92.94	95.16	3.41	91.75	Down
		09/02/09	92.34	0.55	92.89	95.16	3.46	91.70	Down
		10/15/09	92.34	0.54	92.88	95.16	3.64	91.52	Down
		11/03/09	92.34	0.54	92.88	95.16	3.36	91.80	Down
		12/02/09	92.34	0.54	92.88	95.16	3.33	91.83	Down
		01/06/10	92.34	0.60	92.94	95.16	3.61	91.55	Down
		02/03/10	92.34	0.58	92.92	95.16	3.57	91.59	Down
		03/08/10	92.34	0.53	92.87	95.16	3.21	91.95	Down
		04/13/10	92.34	0.56	92.90	96.06	3.21	92.85	Down
		05/05/10	92.34	0.50	92.84	96.06	3.71	92.35	Down
		06/09/10	92.34	0.47	92.81	96.06	3.90	92.16	Down
		07/07/10	92.34	NM	NA	96.06	5.25	90.81	NA
		08/04/10	92.34	NM	NA	96.06	NM	NA	NA
		09/09/10	92.34	0.51	92.85	96.06	3.68	92.38	Down
		SW-3-IP	BECO ROW	05/12/09	93.74	0.23	93.97	97.76	2.81
06/02/09	93.74			NM	NA	97.76	3.20	94.56	NA
07/15/09	93.66			0.10	93.76	97.76	2.78	94.98	Up
08/05/09	93.66			NM	NA	97.76	2.68	95.08	NA
09/02/09	93.66			NM	NA	97.76	3.81	93.95	NA
10/15/09	93.66			NM	NA	97.76	2.77	94.99	NA
11/03/09	93.66			NM	NA	97.76	2.60	95.16	NA
12/02/09	93.66			NM	NA	97.76	2.42	95.34	NA
01/06/10	93.66			0.22	93.88	97.76	2.45	95.31	Up
02/03/10	93.66			NM	NA	97.76	2.51	95.25	NA
03/08/10	93.66			0.18	93.84	97.76	2.36	95.40	Up
04/13/10	93.66			0.36	94.02	96.50	2.34	94.16	Up
05/05/10	93.66			NM	NA	96.50	2.62	93.88	NA
06/09/10	93.66			NM	NA	96.50	NM	NA	NA
07/07/10	93.66			NM	NA	96.50	3.17	93.33	NA
08/04/10	93.66			NM	NA	96.50	NM	NA	NA
09/09/10	93.66			NM	NA	96.50	NM	NA	NA
SW-01-TT	Halls Brook			05/12/09	92.98	1.16	94.14	96.87	5.64
		06/02/09	92.98	0.98	93.96	96.87	5.89	90.98	Down
		07/15/09	92.98	1.10	94.08	96.87	5.51	91.36	Down
		08/05/09	92.98	1.21	94.19	96.87	5.42	91.45	Down
		09/24/09	92.98	1.00	93.98	96.87	5.65	91.22	Down
		10/15/09	92.98	1.02	94.00	96.87	5.54	91.33	Down
		11/03/09	92.98	1.09	94.07	96.87	5.49	91.38	Down
		12/02/09	92.98	1.24	94.22	96.87	5.56	91.31	Down
		01/06/10	92.98	1.21	94.19	96.87	5.55	91.32	Down
		02/03/10	92.98	1.24	94.22	96.87	5.58	91.29	Down
		03/08/10	92.98	1.38	94.36	96.87	5.21	91.66	Down
		04/13/10	92.98	1.36	94.34	96.81	5.11	91.70	Down
		05/05/10	92.98	1.10	94.08	96.81	5.65	91.16	Down
		06/09/10	92.98	0.92	93.90	96.81	5.79	91.02	Down
		07/22/10	92.98	0.86	93.84	96.81	5.89	90.92	Down
		08/04/10	92.98	0.82	93.81	96.81	6.05	90.76	Down
		09/09/10	92.98	0.89	93.87	96.81	5.51	91.30	Down
		SW-02-TT	HBHA Pond Outlet	05/12/09	92.00	1.03	93.03	98.11	NM
06/02/09	92.00			0.78	92.78	98.11	5.20	92.91	Up
07/15/09	97.77			1.05	98.82	103.88	4.95	98.93	Up
08/05/09	97.77			1.20	98.97	103.88	5.91	97.97	Down
09/02/09	97.77			0.86	98.63	103.88	5.19	98.69	Up
10/15/09	97.77			1.04	98.81	103.88	4.95	98.93	Up
11/03/09	97.77			1.20	98.97	103.88	4.77	99.11	Up
12/02/09	97.77			1.38	99.15	103.88	4.59	99.29	Up
01/06/10	97.77			1.37	99.14	103.88	4.59	99.29	Up
02/18/10	97.77			1.18	98.95	103.88	4.81	99.07	Up
03/08/10	97.77			1.42	99.19	103.88	4.52	99.36	Up
04/13/10	97.77			1.48	99.25	103.76	4.49	99.27	Up
05/05/10	97.77			1.97	99.74	103.76	5.90	97.86	Down
06/09/10	97.77			0.90	98.67	103.76	5.09	98.67	Even
07/07/10	97.77			0.68	98.45	103.76	5.33	98.43	Down
08/04/10	97.77			0.68	98.45	103.76	5.40	98.36	Down
09/09/10	97.77			0.91	98.68	103.76	5.12	98.64	Down
SW-03-TT	Aberjona			05/12/09	93.46	0.66	94.12	97.41	3.13
		06/02/09	93.46	0.45	93.91	97.41	3.32	94.09	Up
		07/15/09	93.46	0.62	94.08	97.41	3.13	94.28	Up
		08/05/09	93.46	0.76	94.22	97.41	3.10	94.31	Up
		09/02/09	93.46	0.55	94.01	97.41	3.20	94.21	Up
		10/15/09	93.46	0.60	94.06	97.41	3.25	94.16	Up
		11/03/09	93.46	0.62	94.08	97.41	3.16	94.25	Up
		12/02/09	93.46	0.73	94.19	97.41	3.02	94.39	Up
		01/06/10	93.46	0.70	94.16	97.41	3.07	94.34	Up
		02/03/10	93.32	0.70	94.02	97.41	3.06	94.35	Up
		03/08/10	93.32	0.97	94.29	97.41	2.18	95.23	Up
		04/13/10	93.32	0.94	94.26	97.31	2.81	94.50	Up
		05/05/10	93.32	0.56	93.88	97.31	3.17	94.14	Up
		06/09/10	93.32	0.49	93.81	97.31	3.27	94.04	Up
		07/07/10	93.32	0.24	93.56	97.31	3.53	93.78	Up
		08/04/10	93.32	0.19	93.51	97.31	3.68	93.63	Up
		09/16/10	93.32	0.26	93.58	97.31	3.50	93.81	Up

Table 3
Relative Surface Water and Groundwater Elevations at Time of Baseflow Sampling
Industri-Plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Station ID	Station Description	Date ¹	Surface Water			Groundwater			Gradient
			Measuring Point ² (ft)	Staff Gage Reading (ft)	Surface Water Elevation ³ (ft)	Measuring Point ⁴ (ft)	Depth to Water (ft)	Groundwater Elevation ³ (ft)	
SW-05-TT	Salem Street	05/12/09	93.98	1.45	95.43	98.23	2.71	95.52	Up
		06/02/09	90.89	0.64	91.53	98.23	2.91	95.32	Up
		07/15/09	94.16	1.26	95.42	98.23	2.82	95.41	Down
		08/05/09	94.16	1.32	95.48	98.23	2.79	95.44	Down
		09/02/09	94.16	1.18	95.34	98.23	2.91	95.32	Down
		10/15/09	93.98	1.51	95.49	98.23	2.82	95.41	Down
		11/03/09	93.98	1.59	95.57	98.23	2.45	95.78	Up
		12/02/09	93.98	1.70	95.68	98.23	2.66	95.57	Down
		01/06/10	93.96	1.69	95.65	98.23	1.70	96.53	Up
		02/03/10	93.96	1.66	95.62	98.23	2.69	95.54	Down
		03/08/10	93.96	NM	NA	98.23	2.48	95.75	NA
		04/13/10	94.54	1.04	95.58	98.24	2.59	95.65	Up
		05/05/10	94.54	0.76	95.30	98.24	2.87	95.37	Up
		06/09/10	94.54	0.67	95.21	98.24	3.05	95.19	Down
		07/07/10	94.54	0.36	94.90	98.24	3.39	94.85	Down
		08/04/10	94.54	0.38	94.92	98.24	2.51	95.73	Up
		09/09/10	94.54	0.49	95.03	98.24	2.29	95.95	Up
		SW-06-TT	Montvale Avenue	05/12/09	93.22	1.88	95.10	98.48	3.51
06/02/09	93.22			1.58	94.80	98.48	4.07	94.41	Down
07/15/09	92.76			1.60	94.36	98.48	3.92	94.56	Up
08/05/09	92.76			1.82	94.58	98.48	3.85	94.63	Up
09/02/09	92.76			1.58	94.34	98.48	4.01	94.47	Up
10/15/09	92.76			1.94	94.70	98.48	4.09	94.39	Down
11/03/09	92.76			2.10	94.86	98.48	3.88	94.60	Down
12/02/09	92.27			2.38	94.65	98.48	3.71	94.77	Up
01/21/10	92.27			2.48	94.75	98.48	3.57	94.91	Up
02/18/10	92.32			2.10	94.42	98.48	3.89	94.59	Up
03/08/10	92.26			2.75	95.01	98.48	3.29	95.19	Up
04/13/10	92.21			2.66	94.87	98.45	3.41	95.04	Up
05/05/10	92.21			2.27	94.48	98.45	3.79	94.66	Up
06/09/10	92.21			2.00	94.21	98.45	4.09	94.36	Up
07/07/10	92.21			1.77	93.98	98.45	4.36	94.09	Up
08/04/10	92.21			1.52	93.73	98.45	4.58	93.87	Up
09/09/10	92.21			1.92	94.13	98.45	3.41	95.04	Up
SW-07-TT	Swanton Street			05/12/09	90.03	1.14	91.17	93.87	2.42
		06/02/09	90.03	1.00	91.03	93.87	2.52	91.35	Up
		07/15/09	90.03	1.15	91.18	93.87	2.49	91.38	Up
		08/05/09	90.11	1.12	91.23	93.87	2.43	91.44	Up
		09/02/09	90.11	1.00	91.11	93.87	2.50	91.37	Up
		10/15/09	90.11	1.05	91.16	93.87	2.45	91.42	Up
		11/03/09	90.11	1.09	91.20	93.87	2.37	91.50	Up
		12/02/09	90.11	1.07	91.18	93.87	2.35	91.52	Up
		01/06/10	90.11	1.14	91.25	93.87	NM	NA	NA
		02/03/10	90.11	1.18	91.29	93.87	2.40	91.47	Up
		03/08/10	90.11	1.28	91.39	93.87	1.18	92.69	Up
		04/13/10	90.11	1.38	91.49	93.85	1.95	91.90	Up
		05/05/10	90.11	0.96	91.07	93.85	2.40	91.45	Up
		06/09/10	90.11	0.99	91.10	93.85	2.40	91.45	Up
		07/07/10	90.11	0.94	91.05	93.85	2.57	91.28	Up
		08/04/10	90.11	0.90	91.01	93.85	2.79	91.06	Up
		09/09/10	90.11	0.84	90.95	93.85	2.80	91.05	Up
		SW-08-TT	USGS / Mystic Avenue	05/12/09	89.49	2.84	92.33	95.28	3.36
06/02/09	89.49			2.58	92.07	95.28	3.60	91.68	Down
07/15/09	89.49			2.84	92.33	95.28	3.33	91.95	Down
08/05/09	89.44			2.99	92.43	95.28	3.29	91.99	Down
09/24/09	81.29			10.40	91.69	95.28	3.58	91.70	Up
10/15/09	81.29			10.65	91.94	95.28	3.46	91.82	Down
11/03/09	81.29			10.72	92.01	95.28	3.66	91.62	Down
12/23/09	81.29			11.00	92.29	95.28	2.18	93.10	Up
01/06/10	81.29			11.13	92.42	95.28	3.16	92.12	Down
02/03/10	81.29			10.95	92.24	95.28	3.27	92.01	Down
03/08/10	81.29			14.20	95.49	95.28	2.95	92.33	Down
04/13/10	81.29			11.30	92.59	95.29	2.85	92.44	Down
05/05/10	81.29			10.98	92.27	95.29	3.38	91.91	Down
06/25/10	81.29			10.45	91.74	95.29	3.74	91.55	Down
07/07/10	81.29			10.30	91.59	95.29	3.83	91.46	Down
08/04/10	81.29			10.23	91.52	95.29	3.98	91.31	Down
09/09/10	81.29			10.41	91.70	95.29	3.69	91.60	Down

Notes:

- 1 Relative surface water and groundwater elevations were recorded during baseflow sampling event.
- 2 Reference point is base of gauge (0.00 feet)
- 3 All elevations are relative to station-specific benchmarks and, therefore, are not comparable between stations.
- 4 Reference point is top of casing

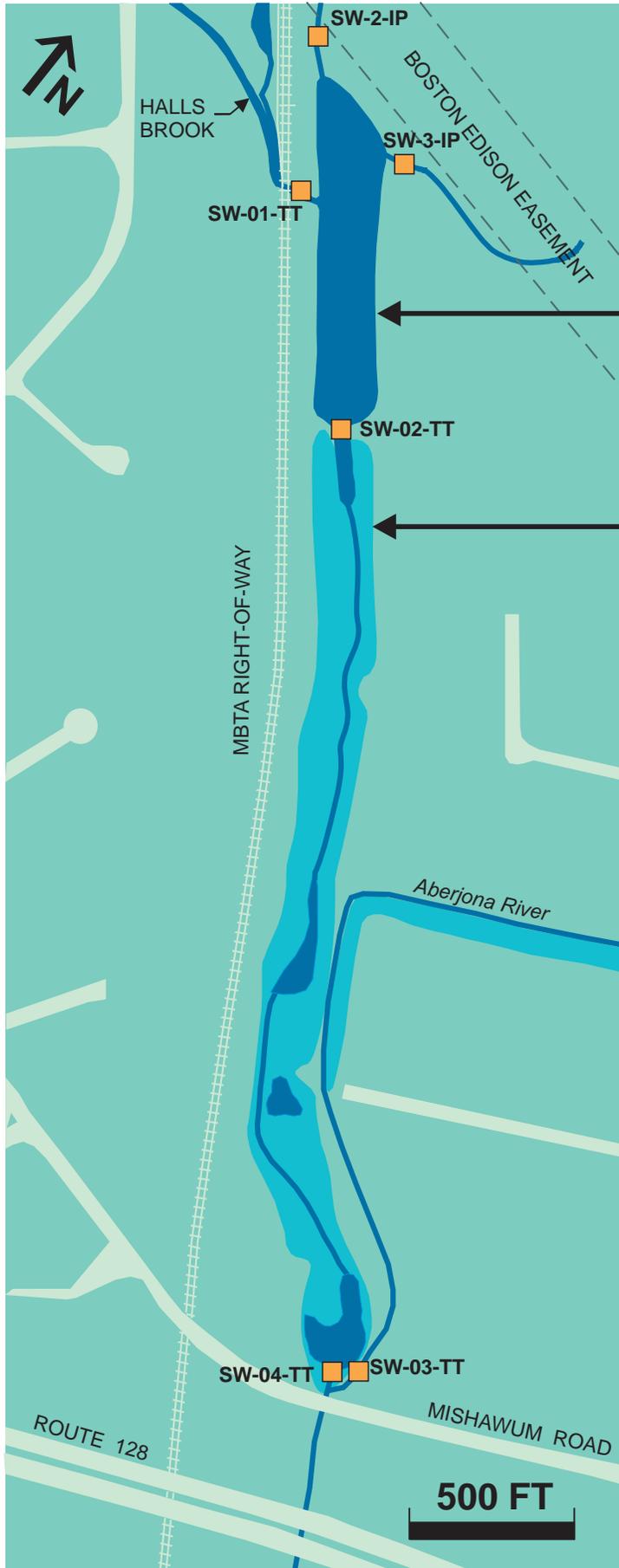
AAD = Atlantic Avenue Drainway
 BECO ROW = Boston Edison Company right-of-way
 HBHA = Halls Brook Holding Area
 USGS = United States Geological Survey
 NA = Not Applicable

NM = Not Measured (e.g., unable to access due to high stage, water frozen in piezometer, staff gauge knocked over). During the July 2009 storm events, staff gauges that were knocked over were unable to be reset prior to the subsequent storm, and therefore measurements were not obtained.

Unk. = Unknown Value

FIGURES

DRAFT



HBHA POND

HBHA WETLAND

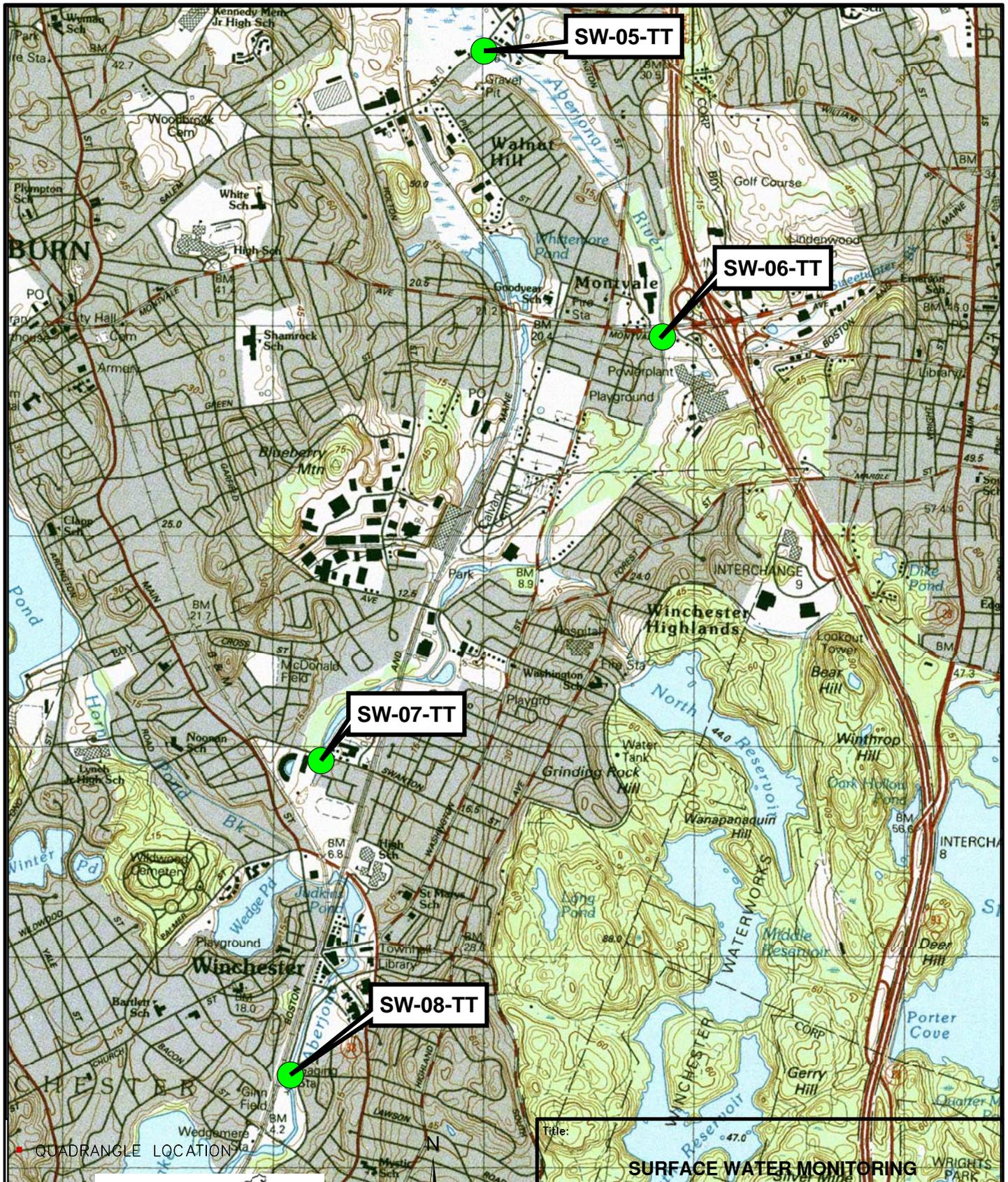
LEGEND

SW-01-TT APPROXIMATE LOCATION AND DESIGNATION OF SURFACE WATER MONITORING STATION

DRAFT

<p>Title:</p> <p>SURFACE WATER MONITORING STATIONS NORTH OF ROUTE 128</p>																		
<p>Prepared for:</p> <p>INDUSTRI-PLEX OU 2 SETTLING DEFENDANTS</p>																		
<p>ROUX ROUX ASSOCIATES INC. <i>Environmental consulting & Management</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">Compiled by:</td> <td style="font-size: small;">LM</td> <td style="font-size: small;">Date:</td> <td style="font-size: small;">7/10/09</td> </tr> <tr> <td style="font-size: small;">Prepared by:</td> <td style="font-size: small;">CRS</td> <td style="font-size: small;">Scale:</td> <td style="font-size: small;">AS SHOWN</td> </tr> <tr> <td style="font-size: small;">Project Mgr.:</td> <td style="font-size: small;">LM</td> <td style="font-size: small;">Office:</td> <td style="font-size: small;">MA</td> </tr> <tr> <td style="font-size: small;">File No.:</td> <td style="font-size: small;">IPS0114202</td> <td style="font-size: small;">Project No.:</td> <td style="font-size: small;">119407M07</td> </tr> </table>	Compiled by:	LM	Date:	7/10/09	Prepared by:	CRS	Scale:	AS SHOWN	Project Mgr.:	LM	Office:	MA	File No.:	IPS0114202	Project No.:	119407M07	<p>FIGURE</p> <p style="font-size: 2em; font-weight: bold;">1</p>
Compiled by:	LM	Date:	7/10/09															
Prepared by:	CRS	Scale:	AS SHOWN															
Project Mgr.:	LM	Office:	MA															
File No.:	IPS0114202	Project No.:	119407M07															

T:\GIS\I-PLEX\IPS0114201.mxd



DRAFT

0 1,000 2,000
 Feet

SOURCE:
 USGS, 1987.
 Reading (Massachusetts) Quadrangle
 1:25,000-scale Topographic Map

Title:
SURFACE WATER MONITORING STATIONS SOUTH OF ROUTE 128

Prepared For:
 INDUSTRI-PLEX OU 2 SETTLING DEFENDANTS

 ROUX ASSOCIATES, INC. <i>Environmental Consulting & Management</i>	Compiled By: LM	Date: 7/10/09	FIGURE 2
	Prepared By: CRS	Scale: AS SHOWN	
	Project Mgr.: LM	Office: MA	
	File No.: IPS0114201	Project: 119401M	

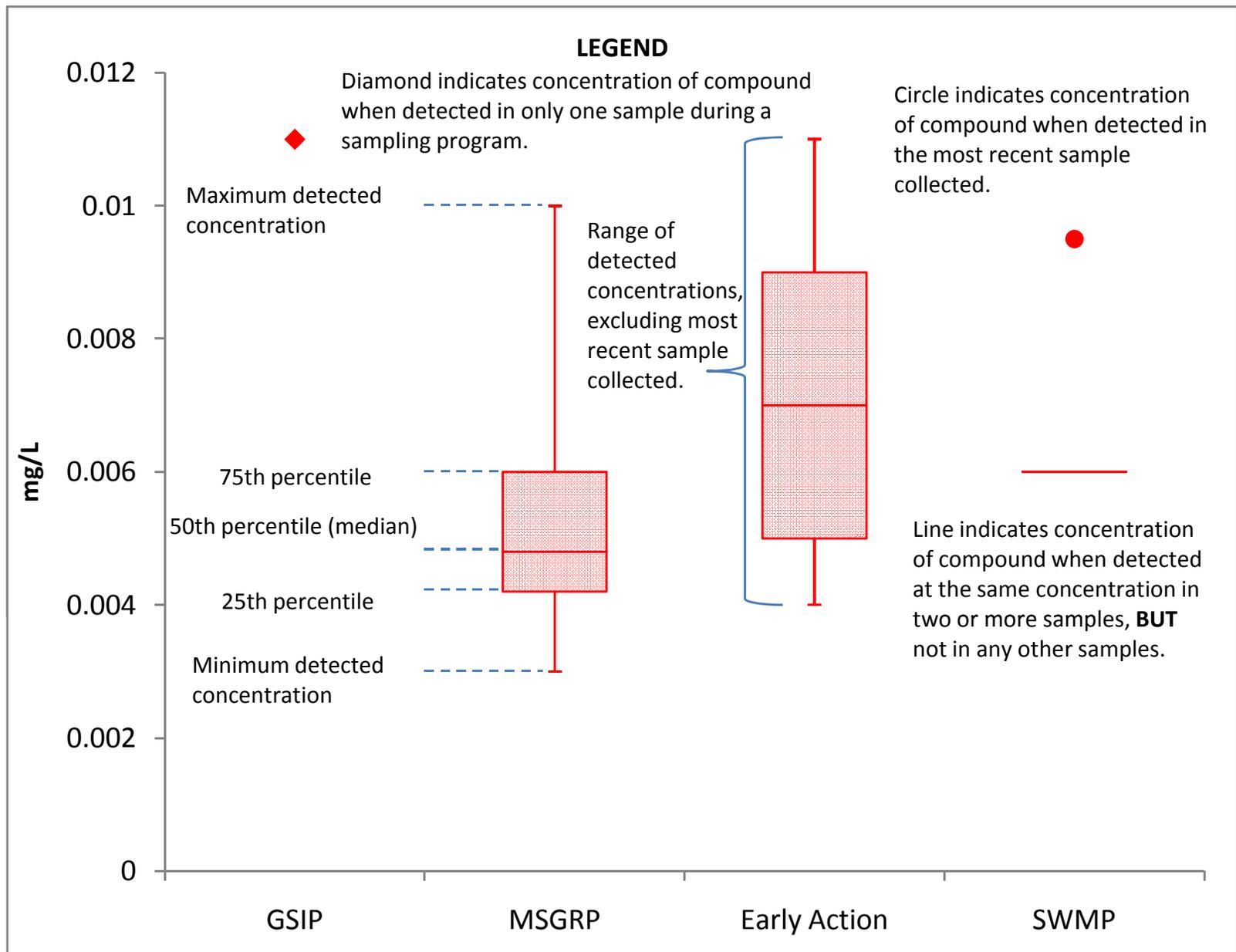
APPENDICES

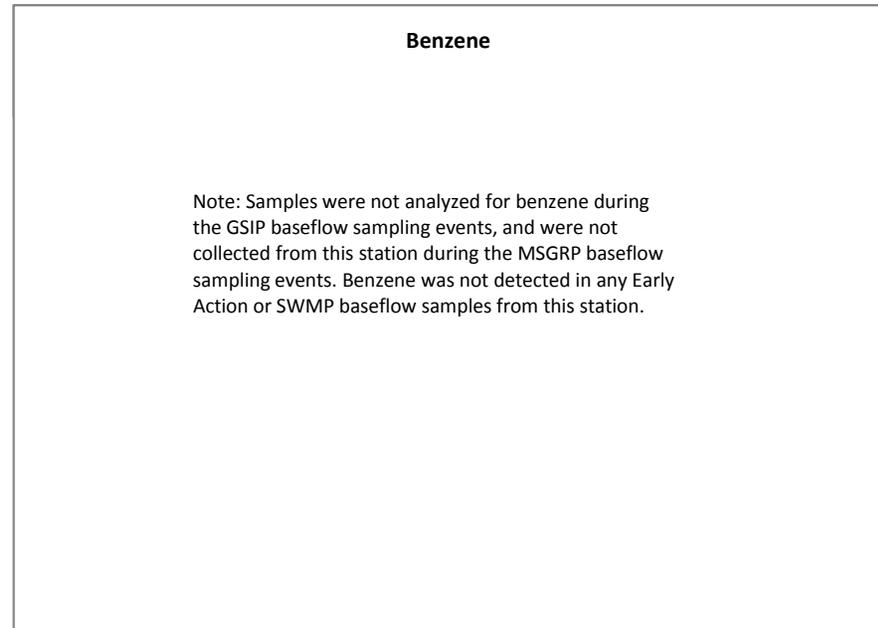
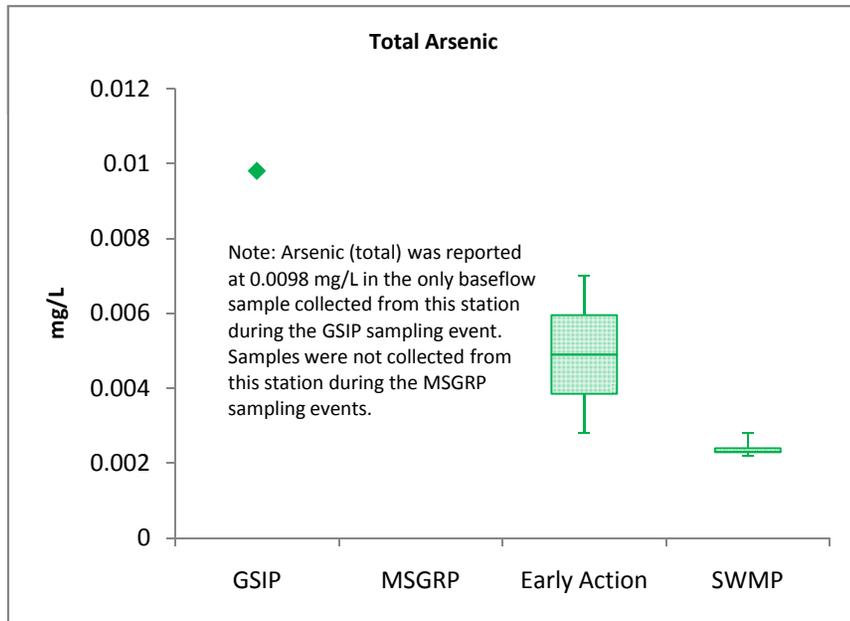
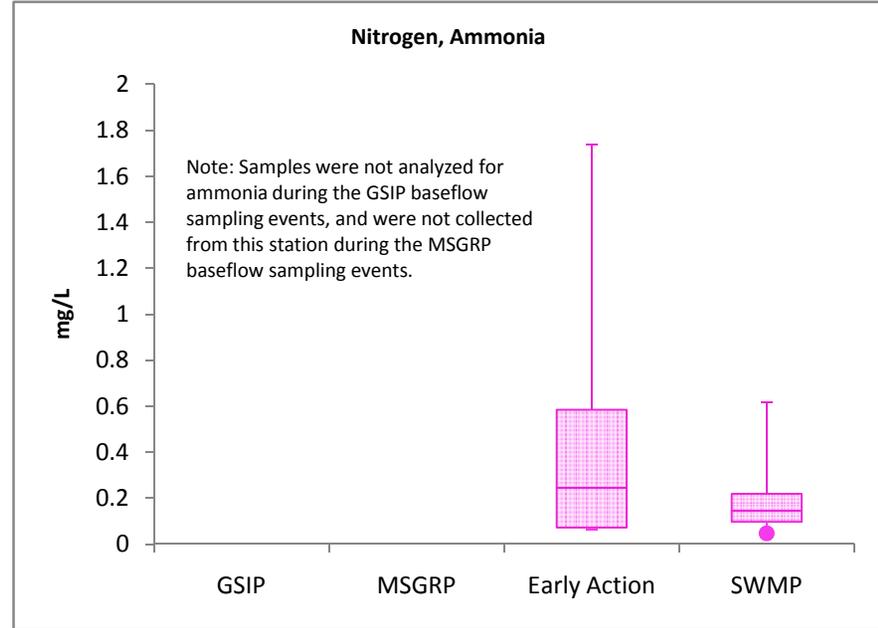
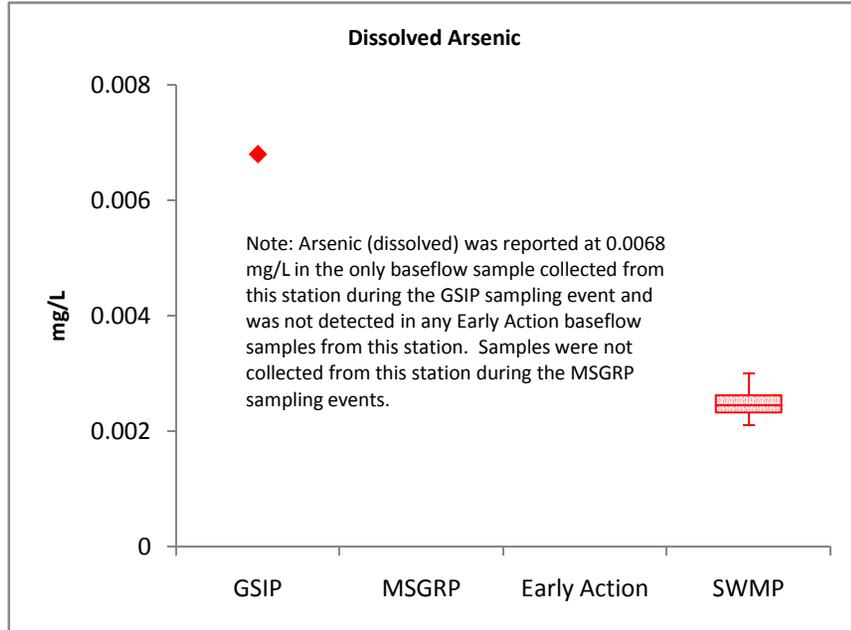
DRAFT

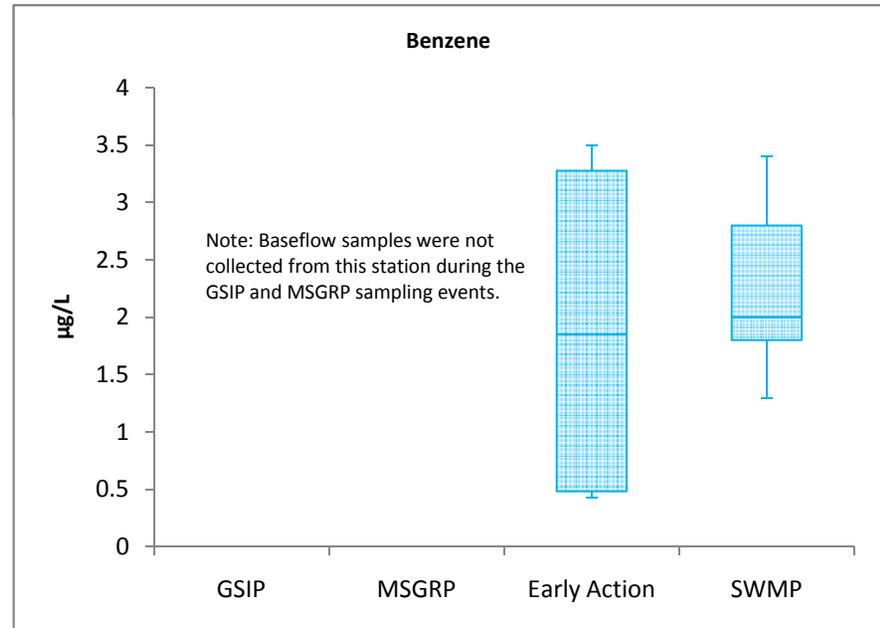
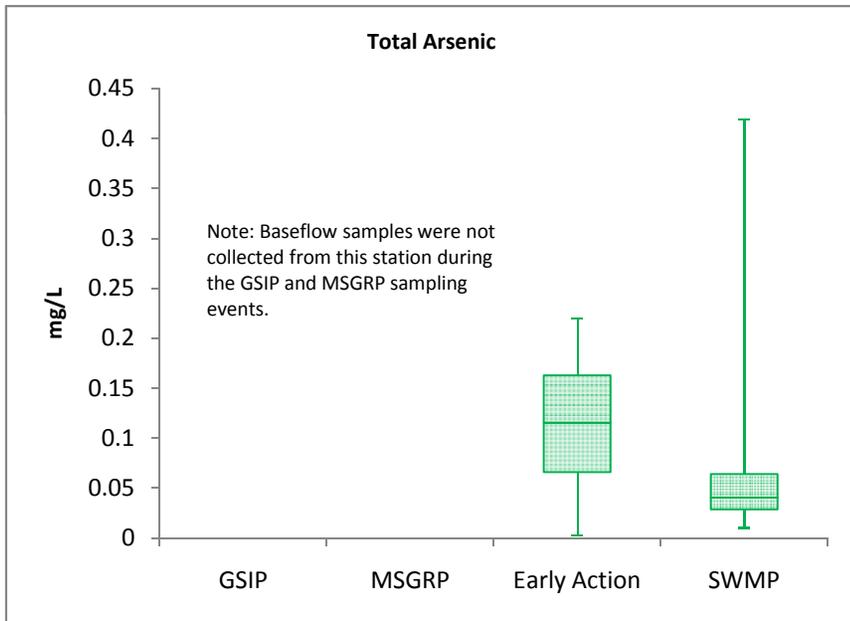
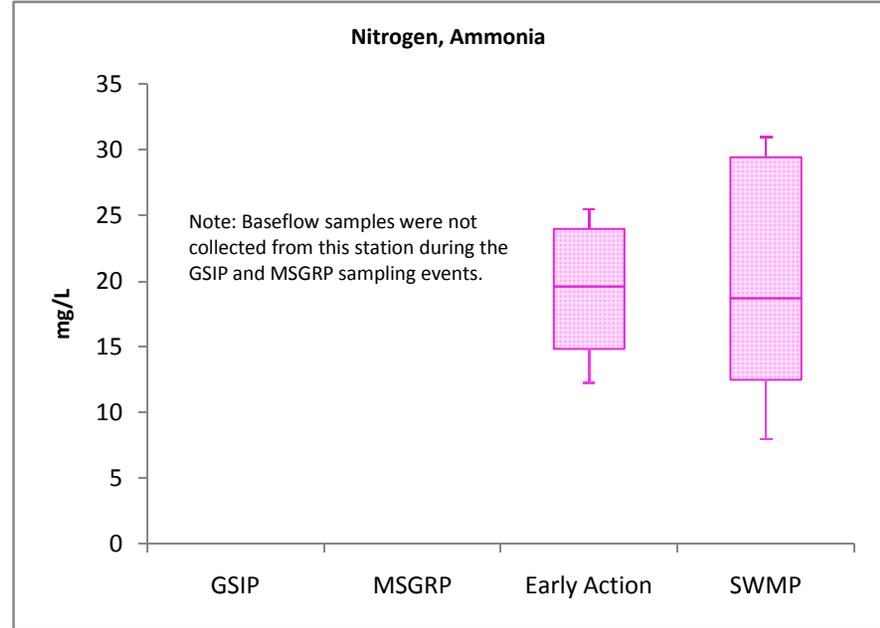
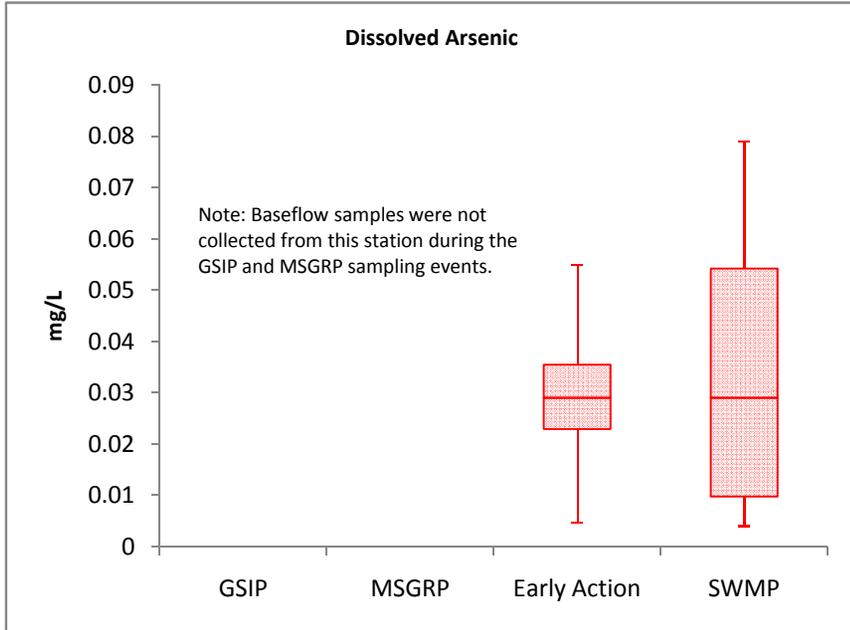
APPENDIX A

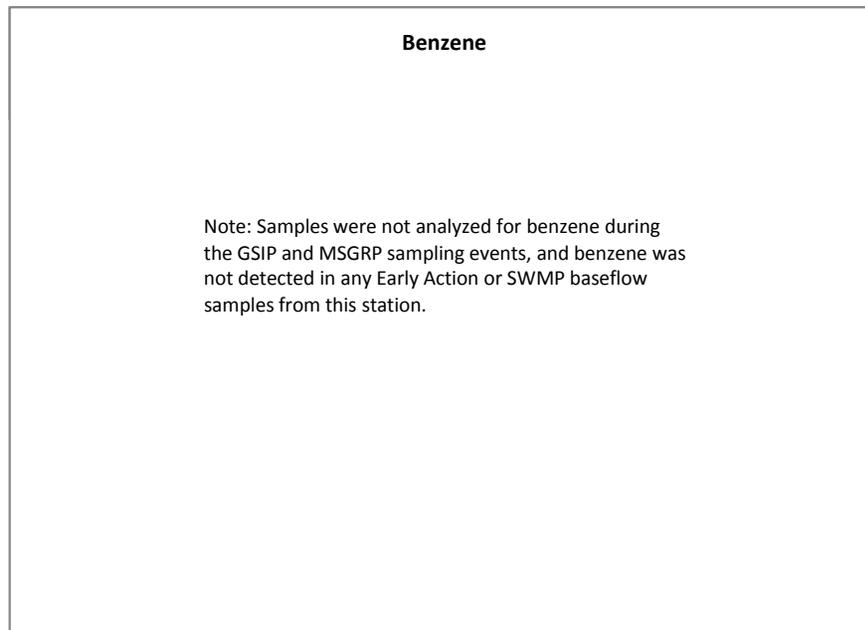
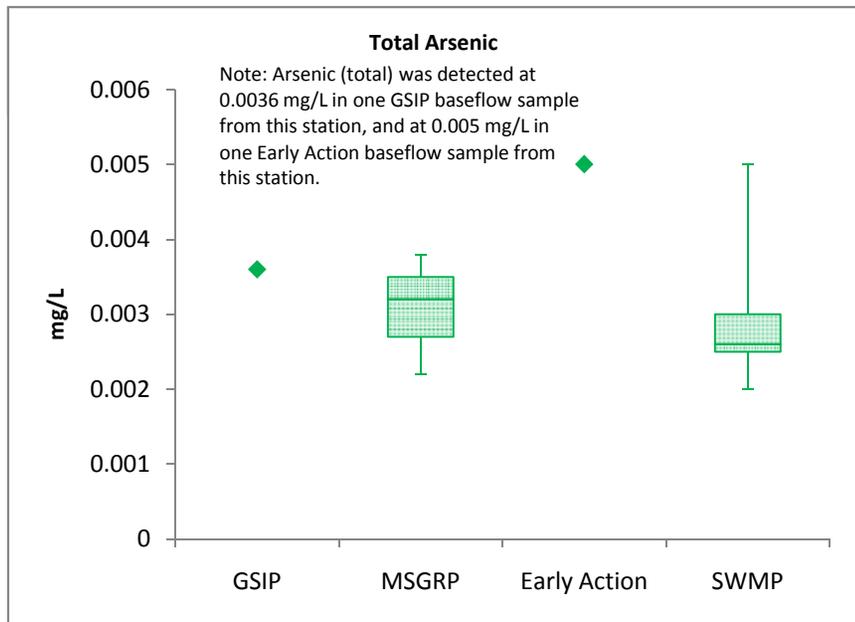
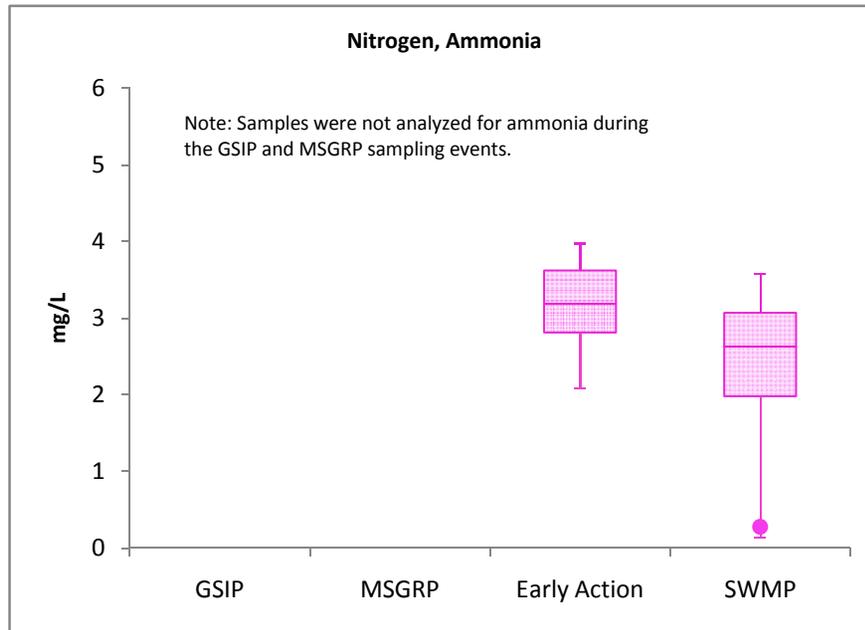
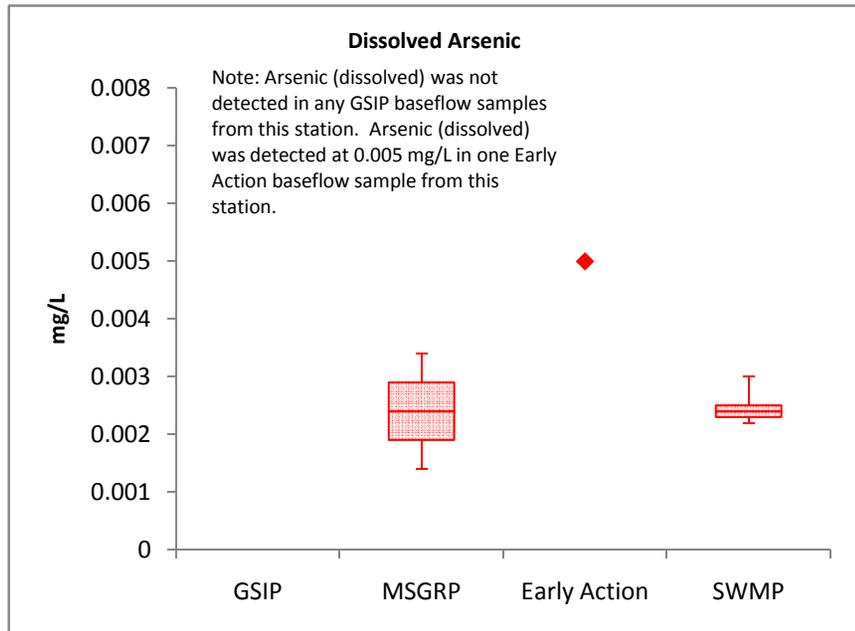
Baseflow Sampling Box-Whisker Plots

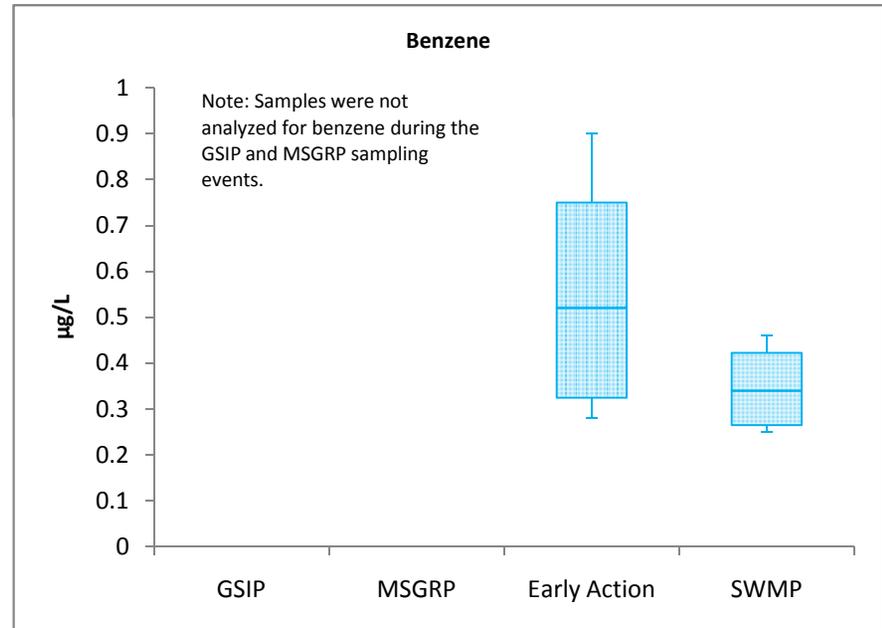
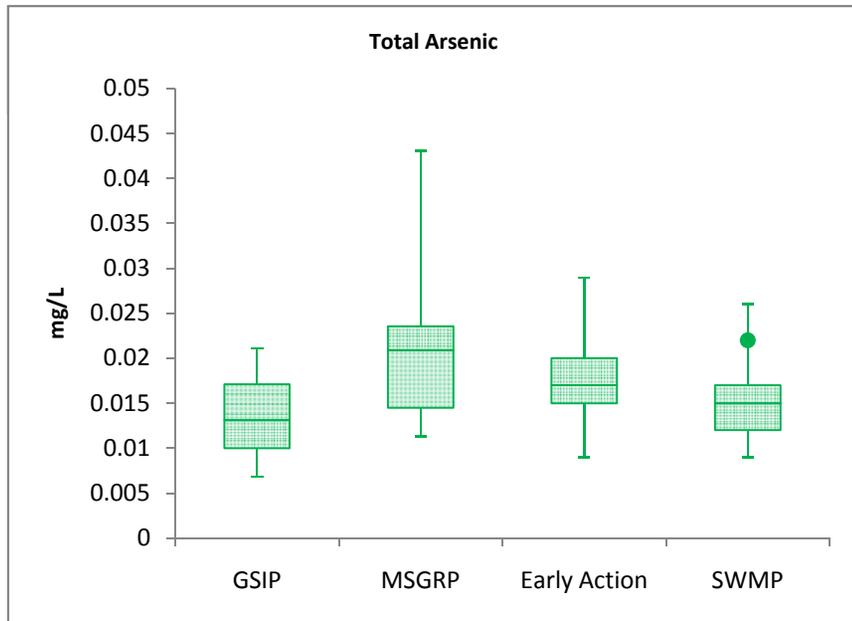
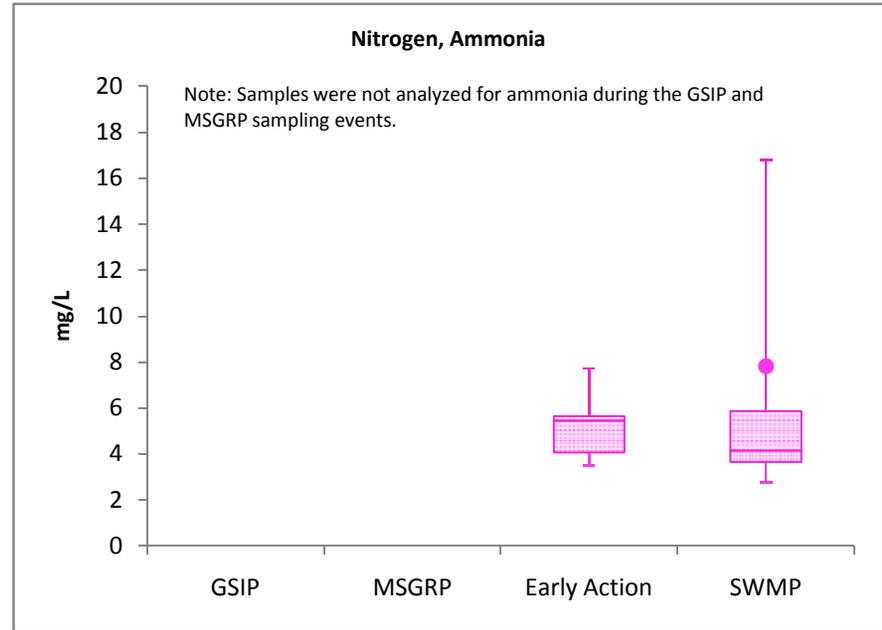
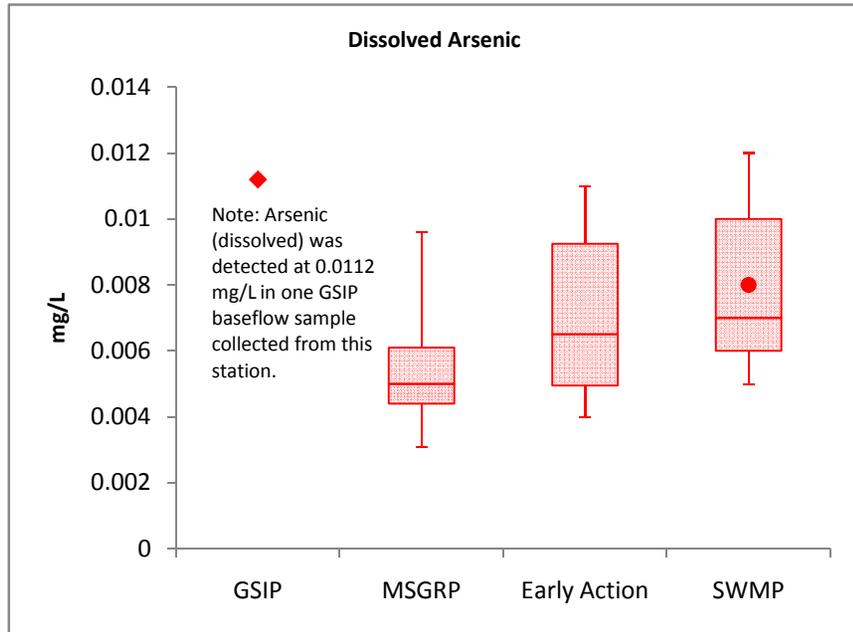
DRAFT

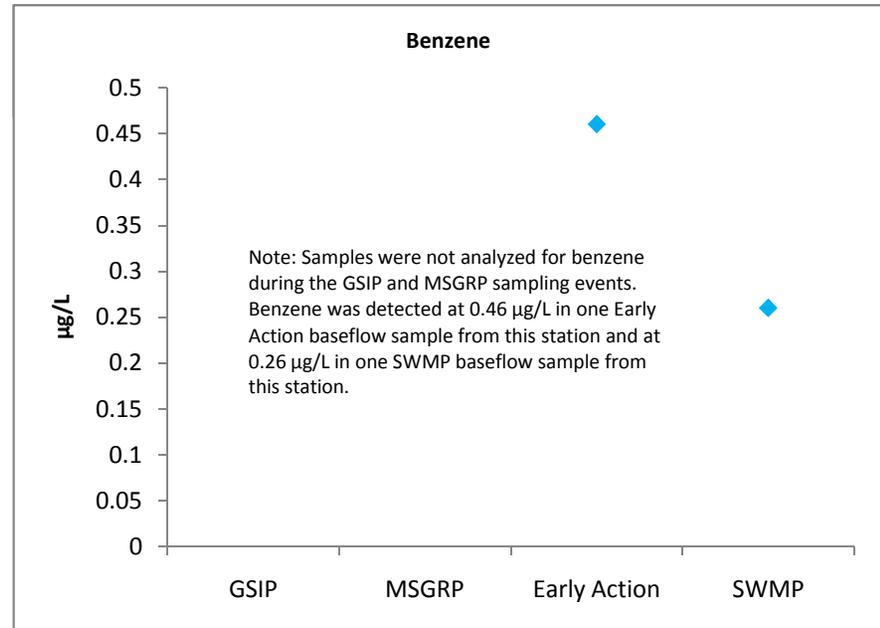
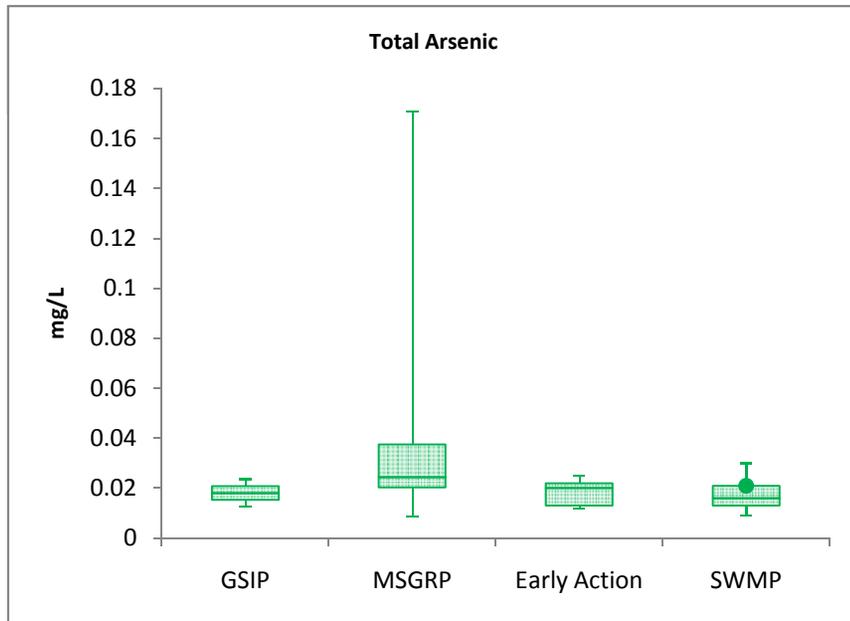
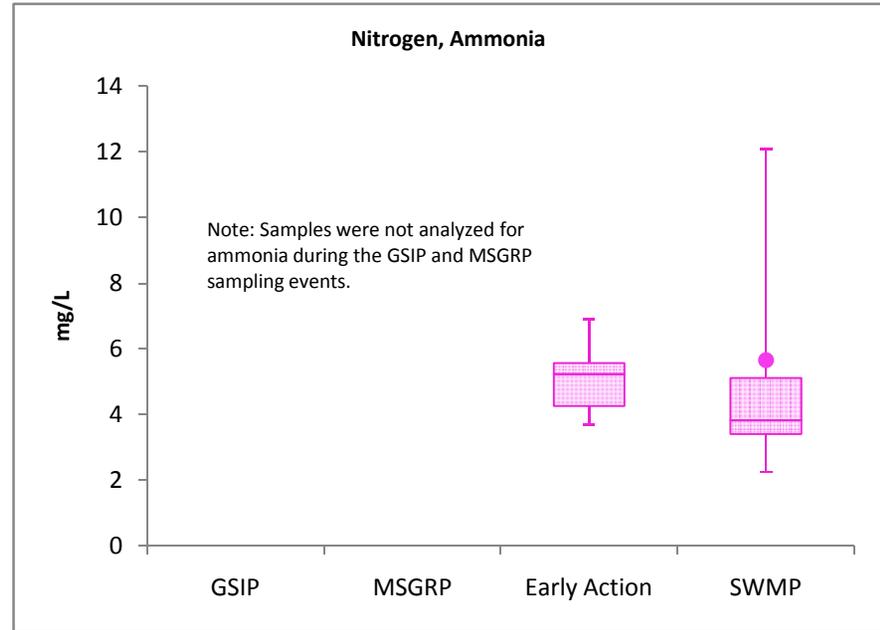
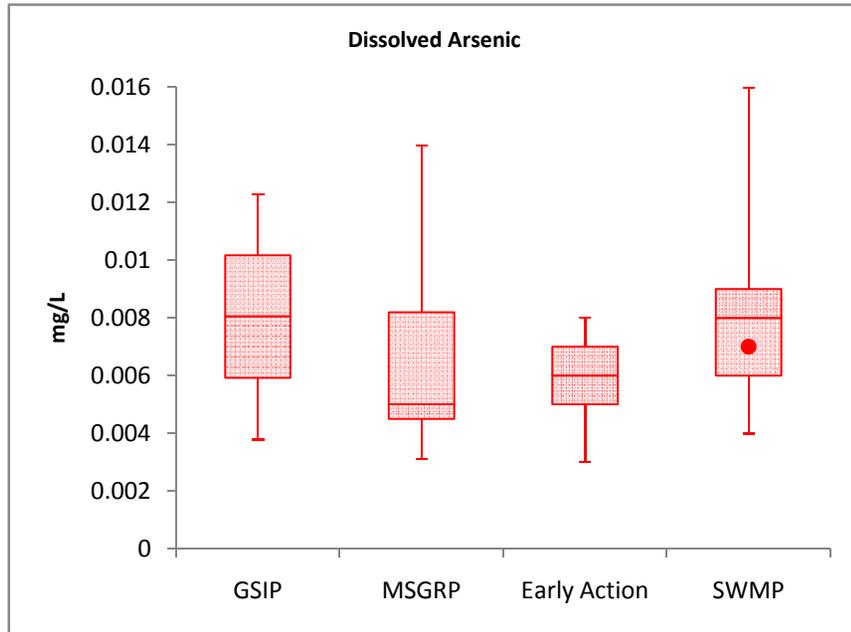


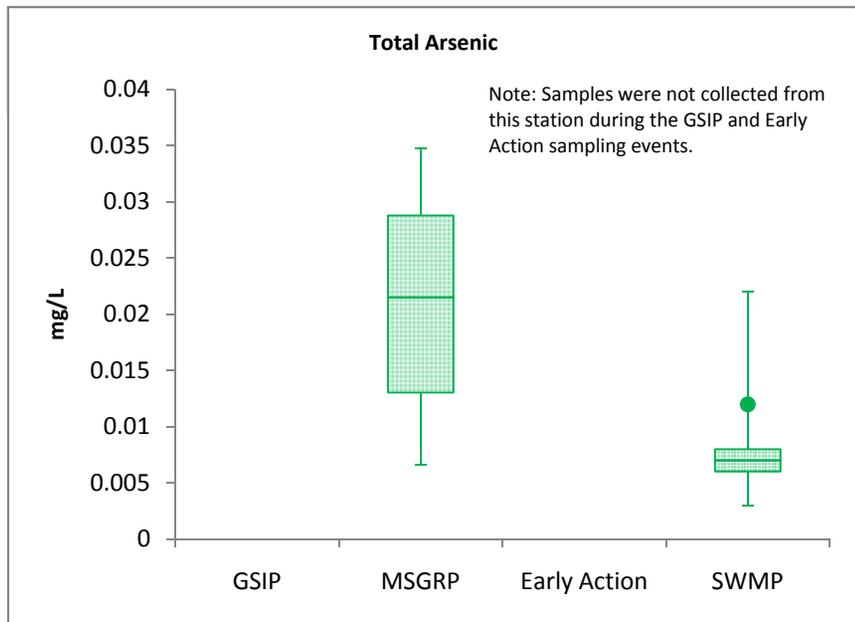
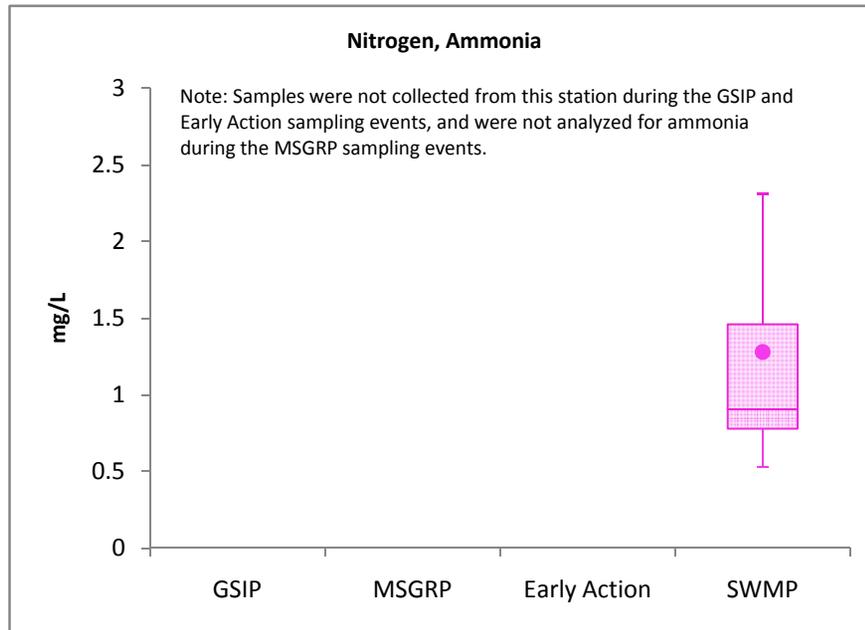
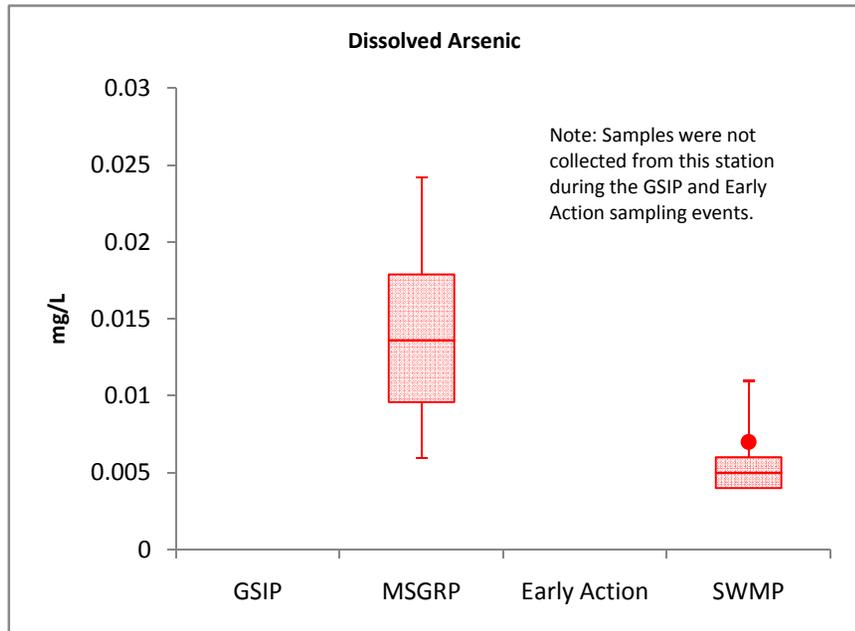




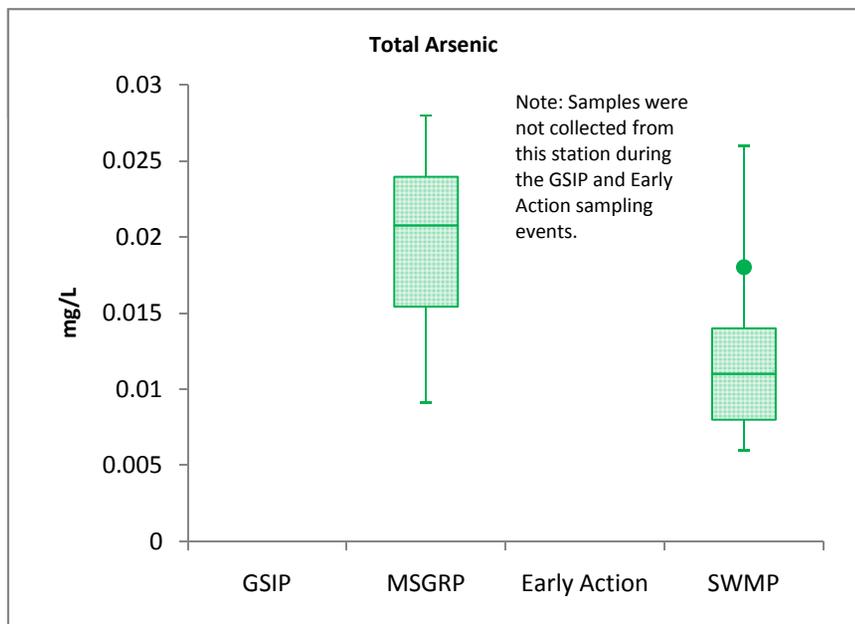
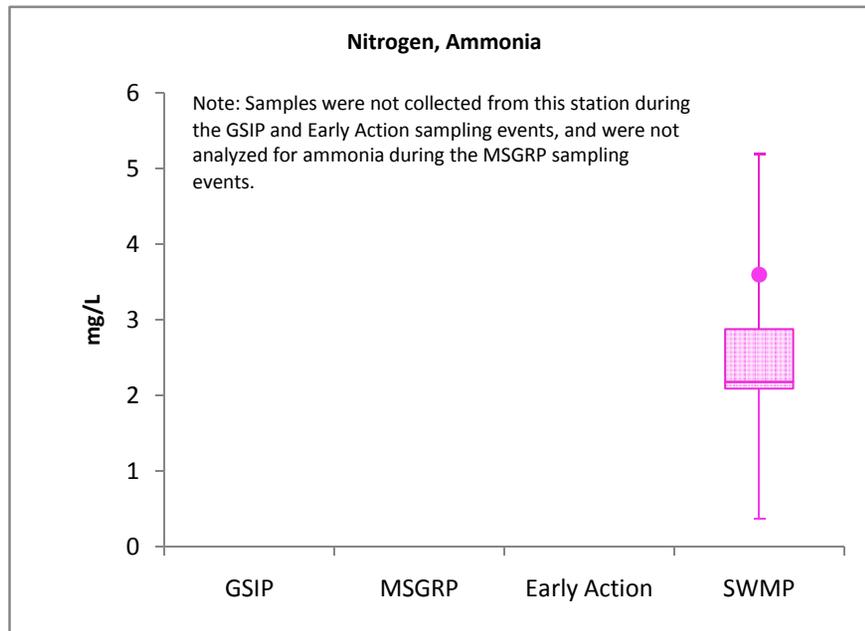
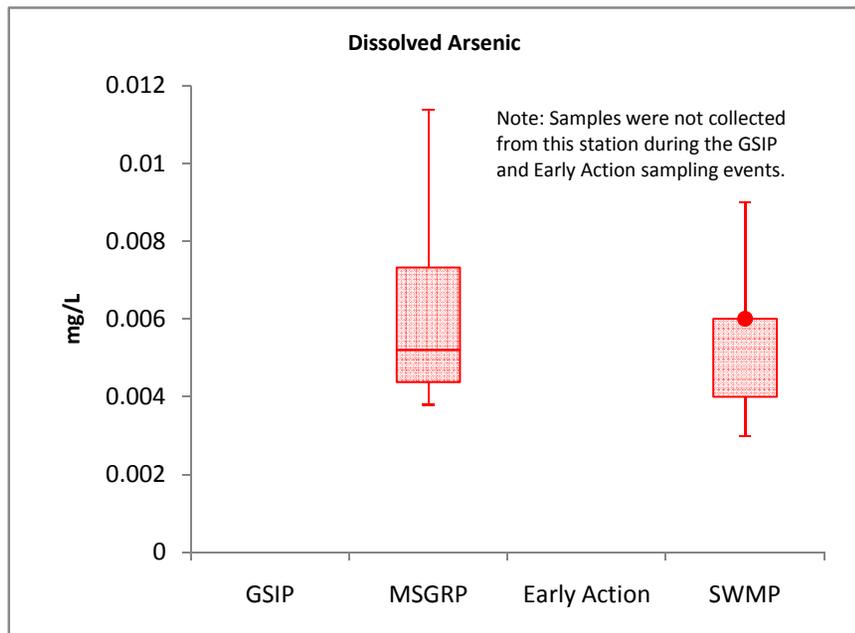




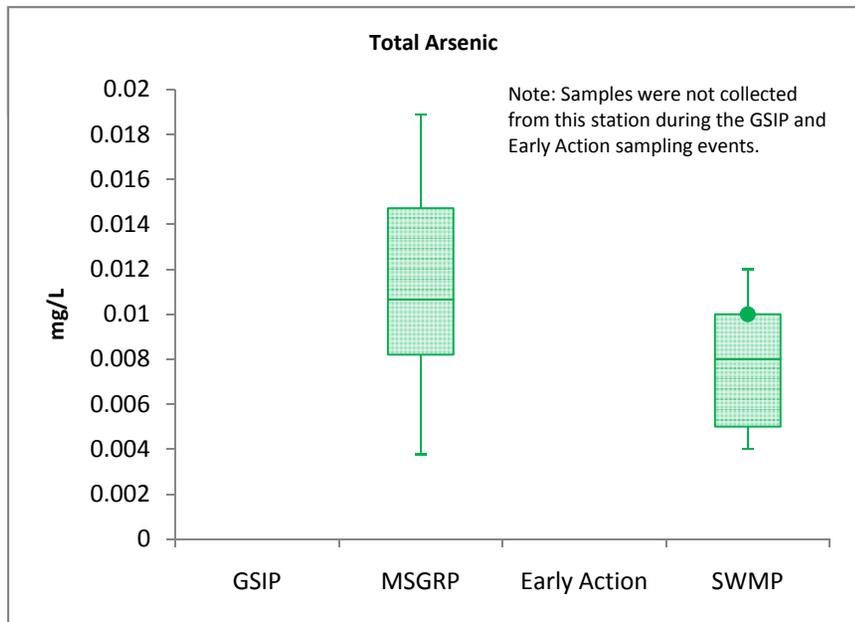
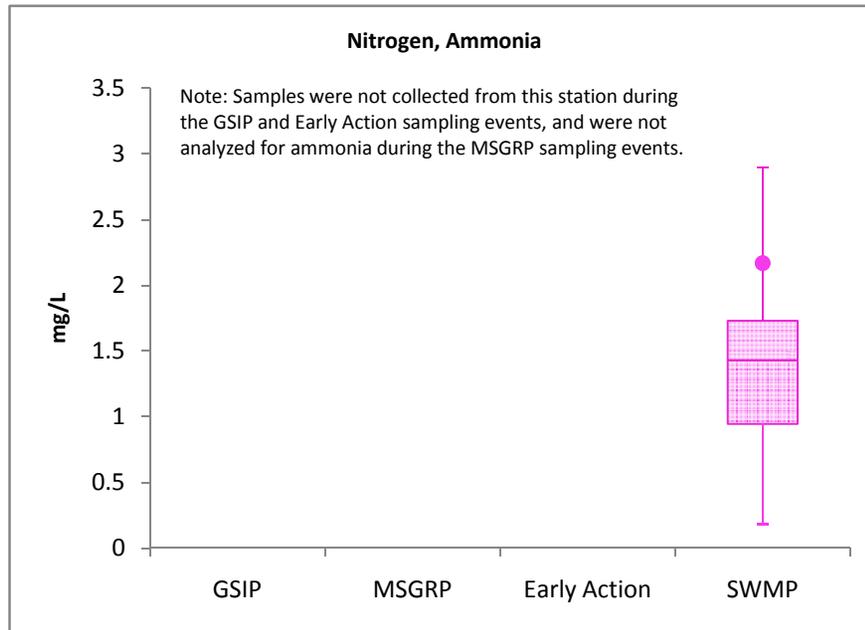
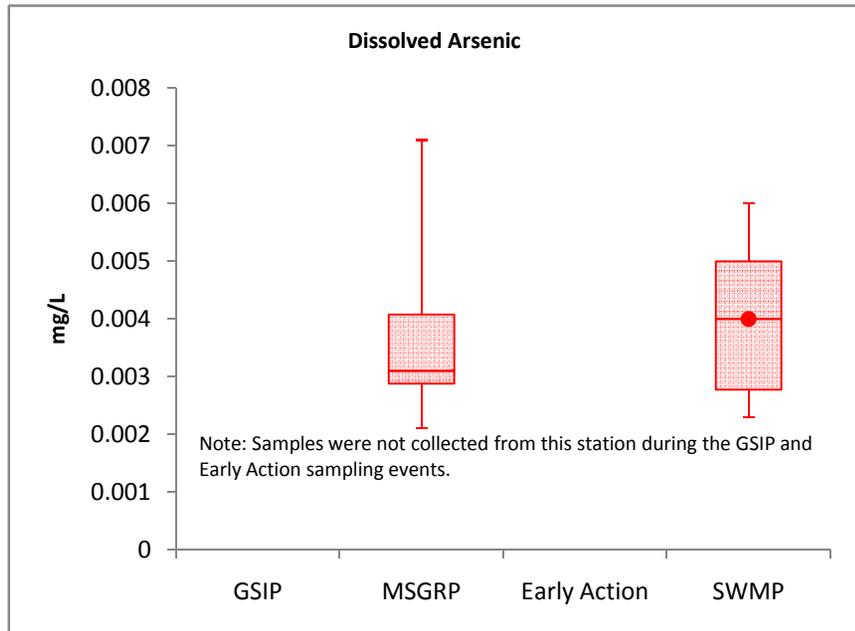




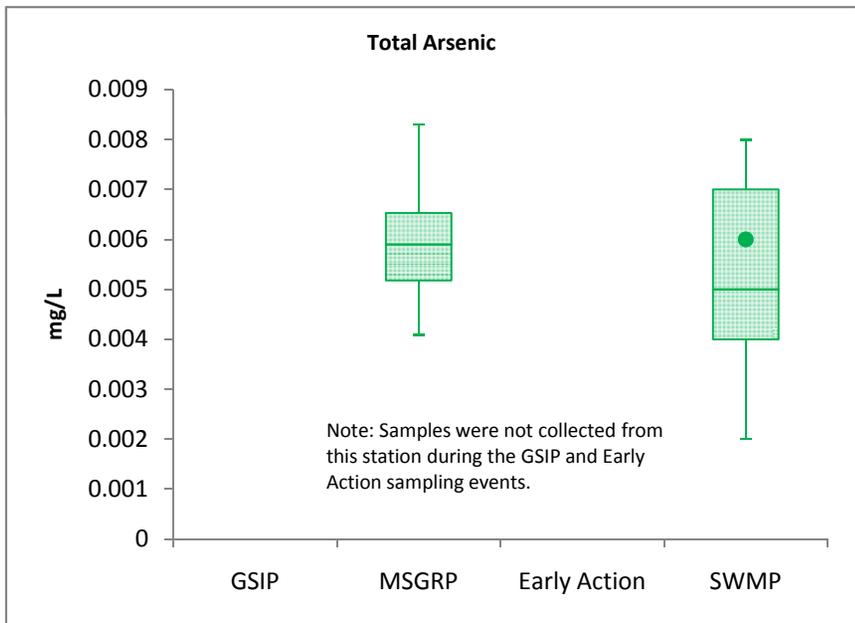
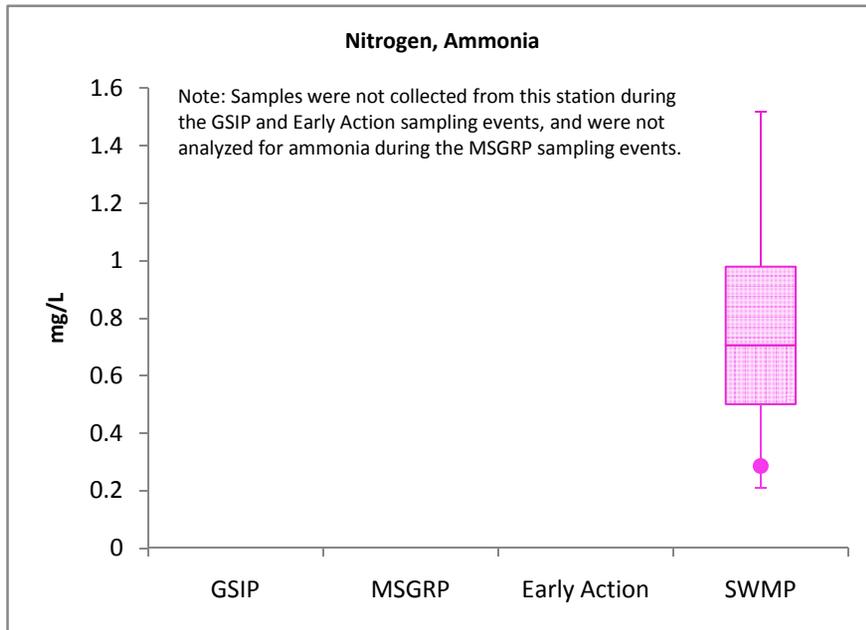
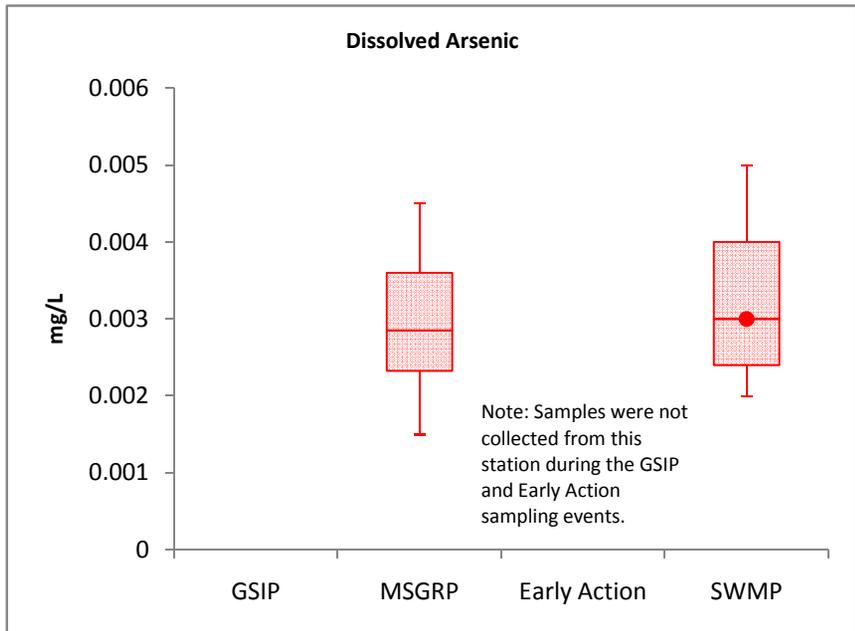
Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP baseflow samples collected from this station.



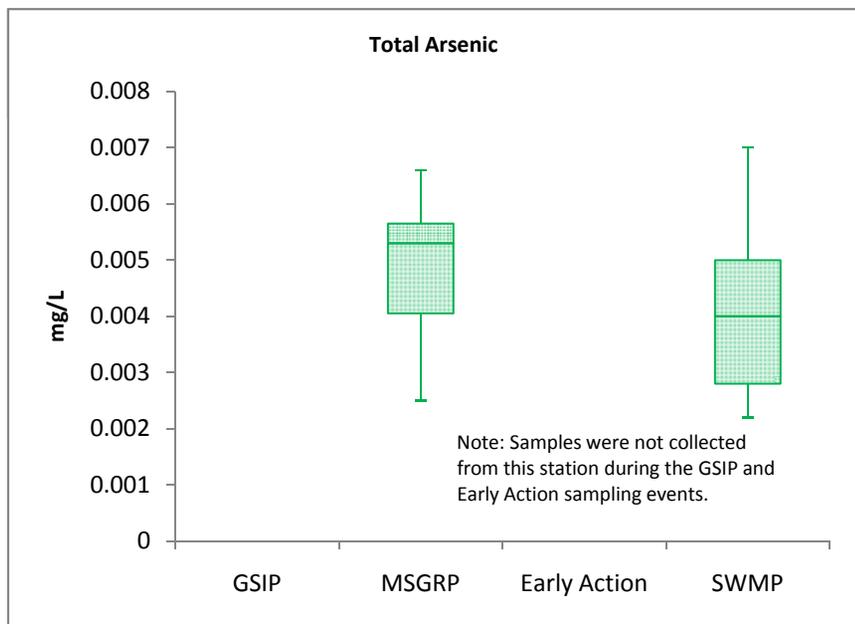
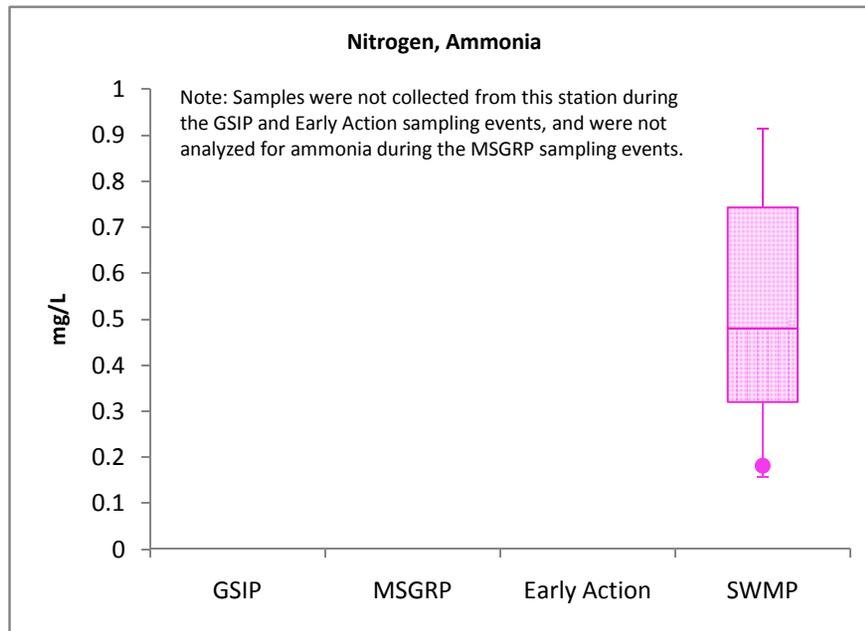
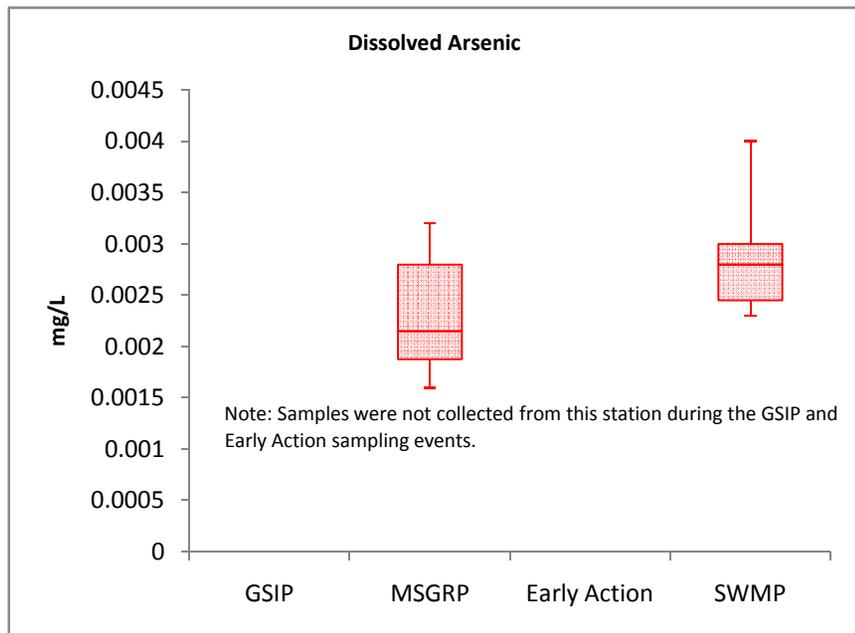
Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP baseflow samples from this station.



Note: Samples were not collected from this station during the GSIP and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP baseflow samples from this station.



Note: Samples were not collected from this station during the GSIP and Early Action sampling events. Samples were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP baseflow samples from this station.



Note: Samples were not collected from this station during the GSI and Early Action sampling events, and were not analyzed for benzene during the MSGRP sampling events. Benzene was not detected in any SWMP baseflow samples from this station.

ATTACHMENT

Geosyntec Memorandum: Water Quality Monitoring Frequency Analysis at HBHA Pond
October 12, 2010

DRAFT

Memorandum

Date: 12 October 2010
To: Bruce Thompson and Todd Majer, *de maximis*, inc.
From: Marc Leisenring and Marcus Quigley, Geosyntec Consultants
Subject: Water Quality Monitoring Frequency Analysis at HBHA Pond

INTRODUCTION AND PURPOSE

This memorandum evaluates the impact of sampling frequency on the ability to characterize water quality upstream and downstream of the Halls Brook Holding Area Pond (HBHA Pond or Pond) at the Industriplex Superfund Site in Woburn, Massachusetts (the Site). The Pond has three inlets and a single outlet (SW-02TT); all of which are currently monitored during storm events using an automated, flow-weighted composite sampling approach. Surface water is also collected and analyzed monthly during non-storm conditions (i.e., baseflow) at inlets and the outlet of the Pond as well as six stations downstream of the Pond (i.e., SW-03TT through SW-08TT).

The focus of this analysis is ammonia (NH₃), total arsenic (TAr), and dissolved arsenic (DAr) concentration data collected at the principal inlet to the Pond (i.e., Halls Brook, identified as station SW-01TT), the outlet to the Pond (station SW-02TT), and the downriver stations (SW-03-TT, SW-04TT, SW-05-TT, SW-06-TT, SW-07-TT, SW-08-TT). The purpose of this analysis is to evaluate whether a statistical difference in the central tendencies and variability in baseflow water quality is likely if sampling frequency is decreased. This is done by calculating the mean, median and variance for NH₃, TAr and DAr concentrations using data sets comprised of all (i.e., monthly) historic baseflow data, half of the historic data set (i.e., representative of bi-monthly sampling) and one-quarter of the historic data set (i.e., representative of quarterly sampling), and then determining if there is a statistically significant difference in the median, mean and variance for the three data sets.

ANALYSIS APPROACH

Monthly measurements of TAr and DAr concentration from baseflow monitoring performed between June 2001 and October 2002, and August 2008 to August 2010 were used for the analysis. Monthly measurements of NH₃ concentration from baseflow monitoring between

August 2008 and August 2010 were used for the analysis. During and between the two monitoring periods there have been no activities upstream or within the HBHA Pond that would be expected to affect the distribution of baseflow concentrations. As such, data from each surface water monitoring station are assumed to arise from a single population and were analyzed as a single data set.

To evaluate how the frequency of monitoring may affect conclusions drawn from the data collected at the three monitoring stations, monthly baseflow data from all stations (SW-01-TT, SW-02-TT, SW-03-TT, SW-04-TT, SW-05-TT, SW-06-TT, SW-07-TT, SW-08-TT) that were collected for the periods listed above, were divided into three subsets: monthly (current monitoring frequency), every other month, and quarterly. Boxplots were generated for each subset to visually investigate potential differences in central tendency and variability. The medians, means and standard deviations for these subsets were then calculated, and hypotheses tests were employed to determine if the computed medians, means or standard deviations for the subsets exhibiting statistically significant differences. Table 1 summarizes the hypothesis tests used in this analysis. For each test, if the resulting p-value is greater than 0.05 then there is no statistical difference among the groups at the 95% confidence level.

Table 1. Hypothesis Tests Used to Evaluate Statistical Differences Between Data Subsets.

Hypothesis Test	Alternative Hypothesis	Assumptions
ANOVA F-test	Means among groups are statistically different	All data sets are normally distributed and variances are equal
Levene's Test	Variances among groups are statistically different	None
Kruskall-Wallis Test	Medians among groups are statistically different	Identically-shaped and scaled distributions

Many samples that were collected over the periods used for this analysis had concentrations of TAR and DAr below laboratory reporting limits. A small number of the NH₃ concentrations were also reported below reporting limits, but only one sample was reported as non-detect (i.e., "U" data qualifier). In order to include the non-detects and below reporting limit values in the analyses, simple substitution was used whereby values that were undetected by the laboratory were substituted with the reporting limit. Values that were detected, but were below the

laboratory reporting limit (i.e., a “J” data qualifier) were substituted with the laboratory’s estimate because these values were deemed more accurate than a simply substituted value. Table 2 summarizes the total number of data points used and number of non-detects (i.e., “U” data qualifiers) for each sampling location.

Table 2. Number of Data Points and Non-Detects for Each Sampling Location.

Sampling Point	Total Arsenic		Dissolved Arsenic		Ammonia	
	No. of Data Points	No. of Non-detects	No. of Data Points	No. of Non-detects	No. of Data Points	No. of Non-detects
SW-01-TT	46	29	46	37	26	0
SW-02-TT	46	1	46	6	26	0
SW-03-TT	35	2	35	5	17	0
SW-04-TT	46	1	46	5	26	0
SW-05-TT	35	0	35	7	17	0
SW-06-TT	34	0	34	10	17	0
SW-07-TT	35	3	35	15	17	0
SW-08-TT	34	5	34	22	17	1

RESULTS

Boxplots have been produced to compare the central tendency and spread of the data for different sampling frequencies. Figure 1 defines the various metrics provided in a boxplot. Figures 2 through 4 include boxplots of total arsenic, dissolved arsenic, and ammonia concentration, respectively, for the eight monitoring locations for each subset of sampling frequency. As shown on the plots, the central tendencies and spread of the data do not change much when a lower sampling frequency is assumed. All of the confidence intervals about the medians overlap and the shape of the data distributions do not significantly vary.

Figure 1. Key Metrics Provided in a Boxplot.

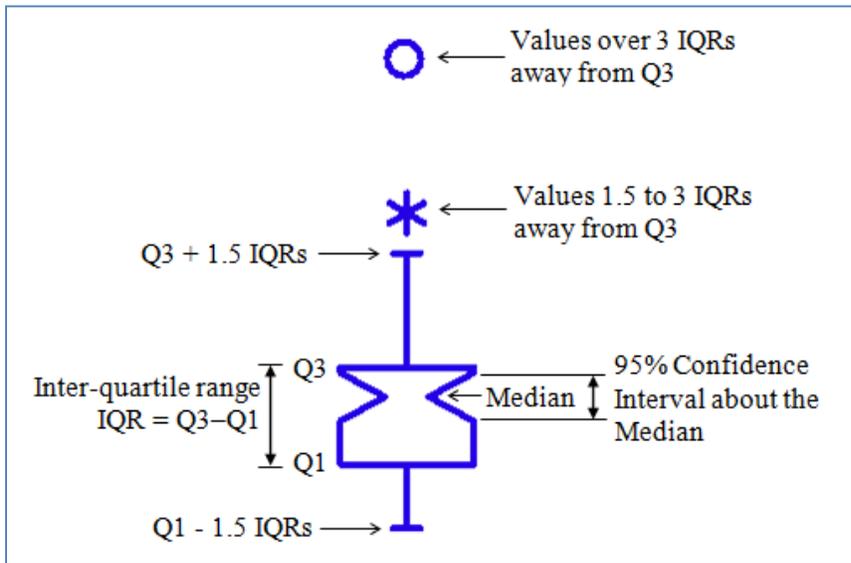


Figure 2. Boxplots of Total Arsenic Concentration for Each Data Subset.

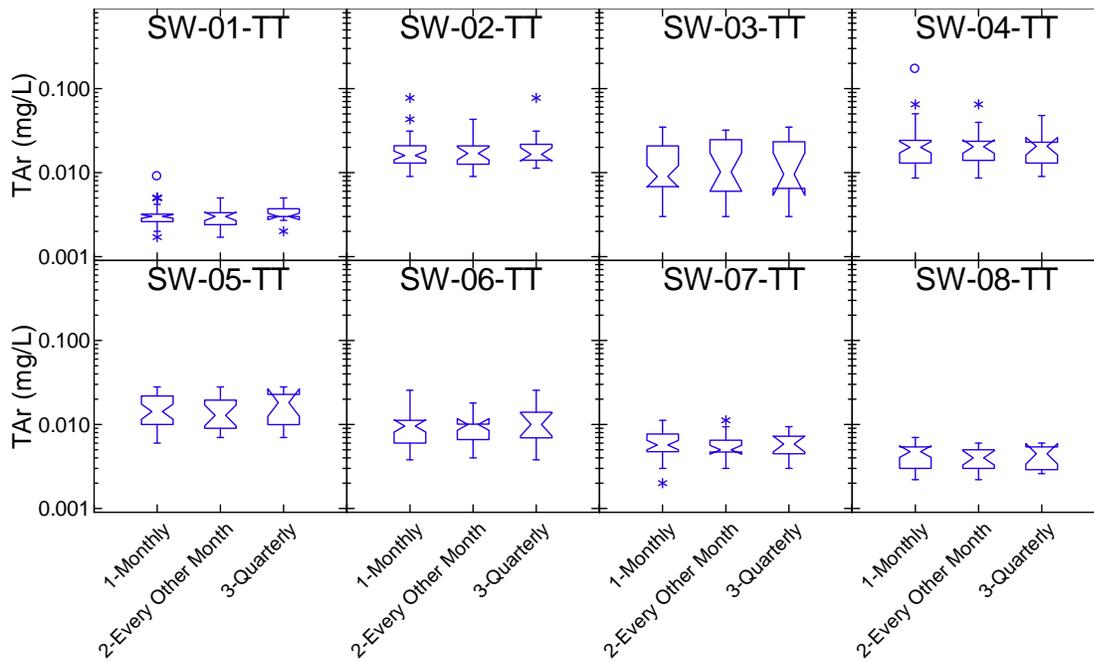


Figure 3. Boxplots of Dissolved Arsenic Concentration for Each Data Subset.

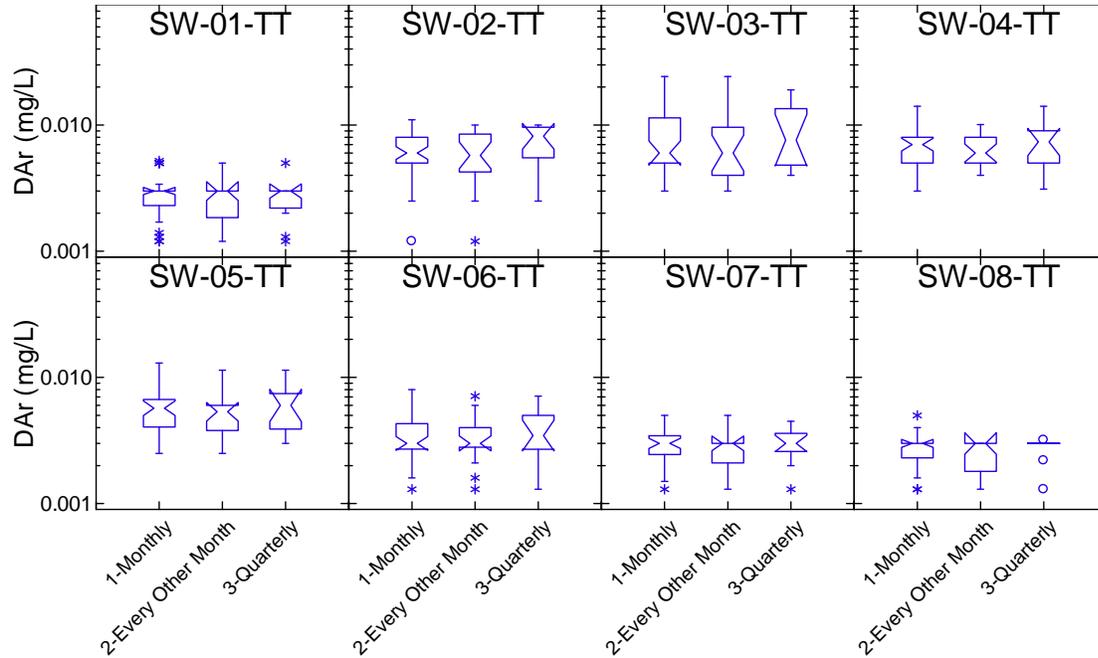
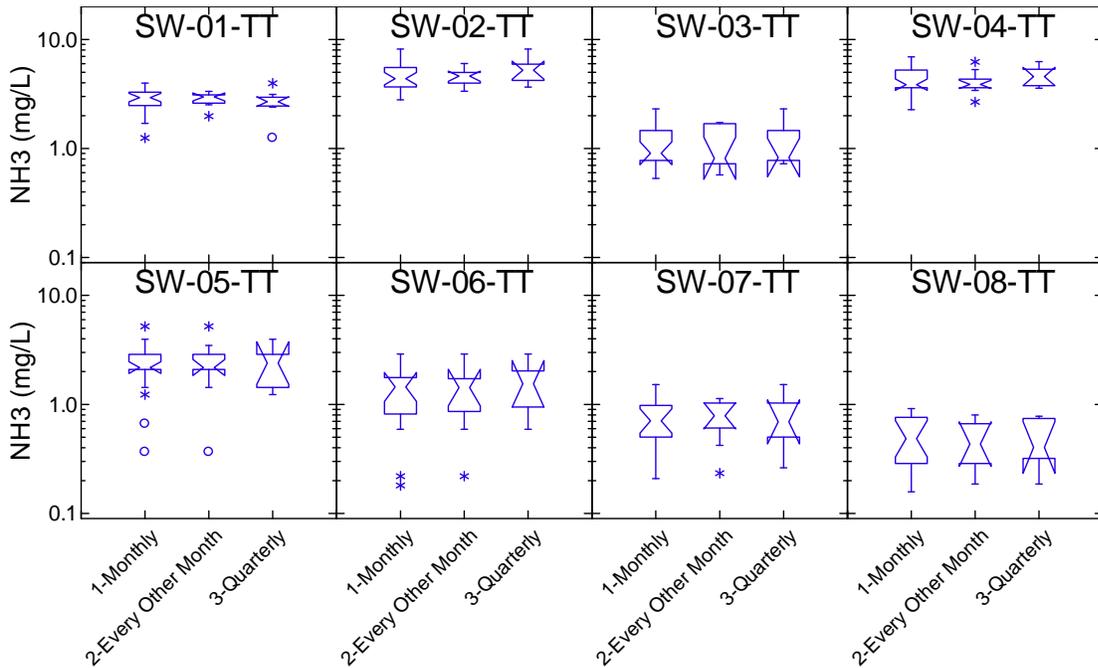


Figure 4. Boxplots of Ammonia Concentration for Each Data Subset.



Tables 3 through 5 below summarize medians, means, and standard deviations in concentration for TAr, DAr and NH₃, respectively, for various data subsets. The median concentrations of all three constituents at all sampling locations do not vary significantly¹ with different monitoring frequencies (i.e., there would be no statistical difference in the median concentrations if prior samples had been collected quarterly or bi-monthly rather than monthly). Similarly, the means and variances between monthly, bimonthly and quarterly data sets also do not differ significantly, indicating that the distributions of baseflow concentrations for the various constituents are adequately described for all sampling frequency regimes. Stated differently, we would be as well informed about the distribution of TAr, DAr and NH₃ concentration under baseflow conditions at all monitoring stations if samples had been collected in the past on a quarterly basis instead of monthly basis.

Table 3. Comparison of Total Arsenic Concentrations for Various Data Subsets.

	Data Subset	Total Arsenic (mg/L)							
		SW-01-TT	SW-02-TT	SW-03-TT	SW-04-TT	SW-05-TT	SW-06-TT	SW-07-TT	SW-08-TT
Medians (mg/L)	Monthly	0.003	0.017	0.009	0.020	0.014	0.010	0.006	0.005
	Every Other Month	0.003	0.017	0.010	0.021	0.013	0.010	0.005	0.004
	Quarterly	0.003	0.017	0.010	0.022	0.018	0.010	0.006	0.005
Kruskall-Wallis p-value (< 0.05 for statistical difference between medians)		0.910	0.859	0.989	0.980	0.613	0.786	0.842	0.837
Means (mg/L)	Monthly	0.003	0.019	0.014	0.025	0.016	0.010	0.006	0.004
	Every Other Month	0.003	0.018	0.014	0.022	0.015	0.009	0.006	0.004
	Quarterly	0.003	0.022	0.015	0.022	0.017	0.011	0.006	0.004
ANOVA F Test p-values (<0.05 for statistical difference between means)		0.822	0.605	0.992	0.749	0.571	0.562	0.868	0.813
Std. Devs. (mg/L)	Monthly	0.001	0.011	0.010	0.025	0.007	0.005	0.002	0.001
	Every Other Month	0.001	0.007	0.010	0.012	0.006	0.004	0.002	0.001
	Quarterly	0.001	0.016	0.011	0.010	0.007	0.006	0.002	0.001
Levene's Test p-values (<0.05 for statistical difference between variances)		0.582	0.662	0.929	0.708	0.841	0.428	0.692	0.739

¹ "Significance" when used to describe the results of the analysis means with 95% statistical significance.

Table 4. Comparison of Dissolved Arsenic Concentrations for Various Data Subsets.

		Dissolved Arsenic (mg/L)							
		SW-01-TT	SW-02-TT	SW-03-TT	SW-04-TT	SW-05-TT	SW-06-TT	SW-07-TT	SW-08-TT
Data Subset									
Medians (mg/L)	Monthly	0.003	0.006	0.006	0.007	0.005	0.003	0.003	0.003
	Every Other Month	0.003	0.006	0.006	0.006	0.005	0.003	0.003	0.003
	Quarterly	0.003	0.008	0.006	0.008	0.006	0.004	0.003	0.003
Kruskall-Wallis p-value (< 0.05 for statistical difference between medians)		0.776	0.433	0.855	0.689	0.619	0.929	0.614	0.310
Means (mg/L)	Monthly	0.003	0.007	0.009	0.007	0.006	0.004	0.003	0.003
	Every Other Month	0.003	0.006	0.008	0.007	0.005	0.004	0.003	0.002
	Quarterly	0.003	0.007	0.009	0.008	0.006	0.004	0.003	0.003
ANOVA F Test p-values (<0.05 for statistical difference between means)		0.709	0.493	0.915	0.403	0.643	0.904	0.696	0.373
Std. Devs. (mg/L)	Monthly	0.001	0.003	0.006	0.003	0.002	0.001	0.001	0.001
	Every Other Month	0.001	0.003	0.006	0.002	0.002	0.002	0.001	0.001
	Quarterly	0.001	0.003	0.005	0.003	0.003	0.002	0.001	0.001
Levene's Test p-values (<0.05 for statistical difference between variances)		0.782	0.613	0.939	0.296	0.867	0.887	0.767	0.441

Table 5. Comparison of Ammonia Concentrations for Various Data Subsets.

	Data Subset	Ammonia (mg/L)							
		SW-01-TT	SW-02-TT	SW-03-TT	SW-04-TT	SW-05-TT	SW-06-TT	SW-07-TT	SW-08-TT
Medians (mg/L)	Monthly	2.84	4.77	0.91	3.98	2.18	1.45	0.71	0.49
	Every Other Month	2.86	4.77	0.81	3.98	2.18	1.43	0.79	0.43
	Quarterly	2.63	5.51	0.83	5.12	2.42	1.56	0.70	0.41
Kruskall-Wallis p-value (<0.05 for statistical difference between medians)		0.718	0.494	0.936	0.554	0.942	0.908	0.949	0.990
Means (mg/L)	Monthly	2.64	5.63	1.10	4.83	2.35	1.37	0.74	0.51
	Every Other Month	2.63	5.50	1.07	4.77	2.52	1.41	0.76	0.47
	Quarterly	2.40	6.49	1.15	5.48	2.39	1.60	0.79	0.47
ANOVA F Test p-values (<0.05 for statistical difference between means)		0.792	0.425	0.957	0.585	0.943	0.832	0.958	0.917
Std. Devs. (mg/L)	Monthly	0.969	3.425	0.505	2.273	1.167	0.717	0.357	0.257
	Every Other Month	0.850	3.335	0.494	2.485	1.349	0.821	0.312	0.229
	Quarterly	1.085	3.742	0.628	2.648	1.018	0.823	0.444	0.241
Levene's Test p-values (<0.05 for statistical difference between variances)		0.411	0.303	1.000	0.572	0.914	0.924	0.789	0.728

SUMMARY AND CONCLUSIONS

The analysis presented above indicates that the central tendency and variability of TAr, DAR and NH₃ baseflow concentrations measured immediately upstream and downstream of the HBHA Pond would not be significantly affected by a reduced sampling frequency. Specifically, if samples were collected at surface water monitoring stations SW-01TT through SW-08TT on a quarterly or bi-monthly basis, there would be no significant loss of information as compared to the current monthly sampling program. It is therefore our recommendation that baseflow surface water monitoring be conducted on a quarterly basis, rather than the current monthly basis.