



MEMORANDUM
Department of Transportation

E-Mailed TO: Gretchen Teal, Region 8. gteal@dot.state.ny.us
FROM: Mauricio Roma, Office of Environment, 4-1. mroma@dot.state.ny.us
SUBJECT: NYSDOT HARRISON SUBRESIDENCY, WESTCHESTER CO. NYSDEC
REGISTRY # 360035, - SPILL # 94-07349. PETROLEUM SPILL REPORT:
INTERPRETATION OF JULY 2007 GROUNDWATER CONTAMINANT
CONCENTRATIONS AT THE PETROLEUM SPILL AREA
DATE: December 31, 2007

The following is a memorandum report pertaining to the groundwater sampling conducted in July 2007 at the subject site (petroleum spill area; Figure-1). We completed this sampling as a component of the Site Management (Operation and Maintenance) phase of the remediation. We operated the remedial system (Air Sparge / Soil Vapor Extraction) from October, 2000 to October 2002.

The groundwater analytical results (Attachment-A) at the spill site suggest that petroleum contamination is located on the west side of the main building and is not migrating off-site (Figure-2). In addition, the results suggest that site microbes are degrading benzene, toluene, ethylbenzene, xylenes (BTEX) and, possibly, other petroleum compounds. The distribution of contaminant and other groundwater chemical constituents suggests that multiple electron-accepting processes including denitrification, sulfate-, and iron (III)- reduction, are occurring in the petroleum-contaminated aquifer, resulting in the natural attenuation of the contaminant plume (Figure-3). This interpretation is similar to other past interpretations.

Please note that sulfate reduction was the most important biodegradation process prior to starting the groundwater sparging-soil vapor extraction remedial action (mechanical remediation). We have defined the plume boundary as the 25 microgram / liter (ug/l) BTEX isopleth (Figure-2). Please also note that we have not observed any MTBE since 2003.

Discussion

The site upgradient area (well MW-1) is characterized by significantly higher concentrations of dissolved nitrate (NO₃) and sulfate (SO₄) and much lower concentrations of dissolved iron (Fe-II) than the aquifer area with BTEX contamination (Figure-3). BTEX contaminated wells have also lower levels of dissolved oxygen than the upgradient uncontaminated well (MW-1). This suggests that BTEX (electron donor) are primarily being biochemically degraded by 1) denitrifying, 2) SO₄ reducing, and 3) Fe-III reducing (Fe-II is produced) reactions. NO₃ and SO₄ levels are significantly lower (or depleted) in plume wells. NO₃ levels are also lower in other wells that are downgradient from the former leaking fuel tanks and / or the plume. The negative levels of the Oxidation-Reduction potential (Eh or ORP) observed in the samples

confirm that the above biochemical processes are predominantly occurring under anaerobic conditions.

NOTE: *Because the water samples analyzed for Fe-II were filtered in the laboratory instead of the field, we are uncertain of the effect of possible changes of the oxidation-reduction potential on the original Fe-II concentration.*

BTEX also appear to be somewhat degraded by aerobic processes. However, considering that the background dissolved oxygen (DO) concentration is low and that Eh values are negative, I believe that this is not a dominant process.

Therefore, it appears that the anaerobic process of nitrate reduction is prevalent during the degradation of the petroleum product, probably followed by SO₄⁻ and Fe-III - reduction. It is possible that aerobic respiration may also be degrading the BTEX mass to some extent.

The low levels of NO₃ in wells MW-11 and PC-1 (downgradient from the plume; see “note” below) may suggest that the much cleaner water found at these wells derives (at least in part) from the plume area. It appears that microbes in the plume area have used a significant amount of the nitrate during the hydrocarbon degradation process.

NOTE: *The sample holding time for NO₃ at well PC-1 was exceeded by a few hours; therefore, NO₃ results at this well may be biased low.*

In addition to the above findings, we have observed the following:

- 1 - Mechanical remediation appears to have largely enhanced the naturally existing biodegradation because we achieved an approximately 90% reduction of BTEX-MTBE levels during the first year of the remedial system operation.
- 2 - Plume morphology has somewhat changed through time, but the plume has remained contained on site (Figures 4 and 5).
- 3 - Biodegradation processes changed from sulfate reduction (the original most dominant anaerobic process) to denitrification and, probably, Fe-III reduction during and soon after the termination of the mechanical remediation in October 2002. The 2007 data suggests that sulfate reduction processes are again playing a significant role in the natural attenuation of site hydrocarbons.

In order to better delineate the plume, in February 2006 we installed a water table well (MW-11) following NYSDEC protocols. At that time, we also performed a sub-slab soil vapor investigation (SVI) at the building area closest to the spill. During the SVI, we detected non-site related volatile organic compounds (VOCs) at levels that do not represent an exposure concern given the current use of the building and site (e.g., large equipment storage, office space and restrooms).

Our consultant HDR/LMS has collected and analyzed the groundwater samples following the same (or similar) protocols as in past investigations. This time, all the field parameters were measured with a flow cell meter (YSI Multimeter).

Attachment-B contains the well sampling logs. I understand that you will mail the CD containing all the analytical data and related information to all of the involved parties.

Attachment-C is our current site status report which provides additional site background information.

If you have any questions, please let me know.

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FIGURE-1



Legend

-  Petroleum Spill
-  Landfill

0 37.5 75 150 225 300 Meters



**NYSDOT HARRISON SUBRESIDENCY,
WESTCHESTER CO. SITE LOCATION**

NYSDOT
Environmental Analysis Bureau
M.Roma, September 22, 2006

FIGURE-2

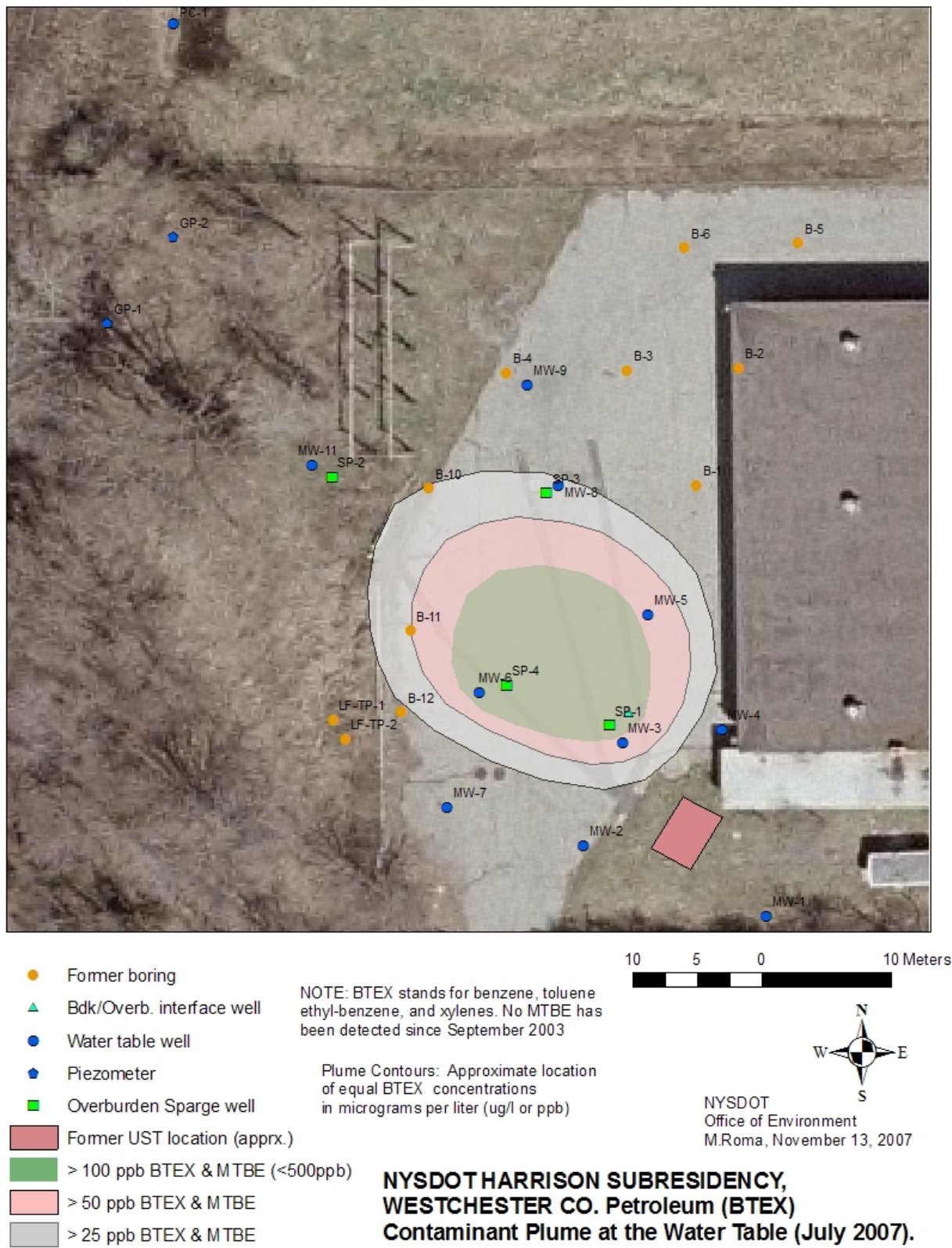
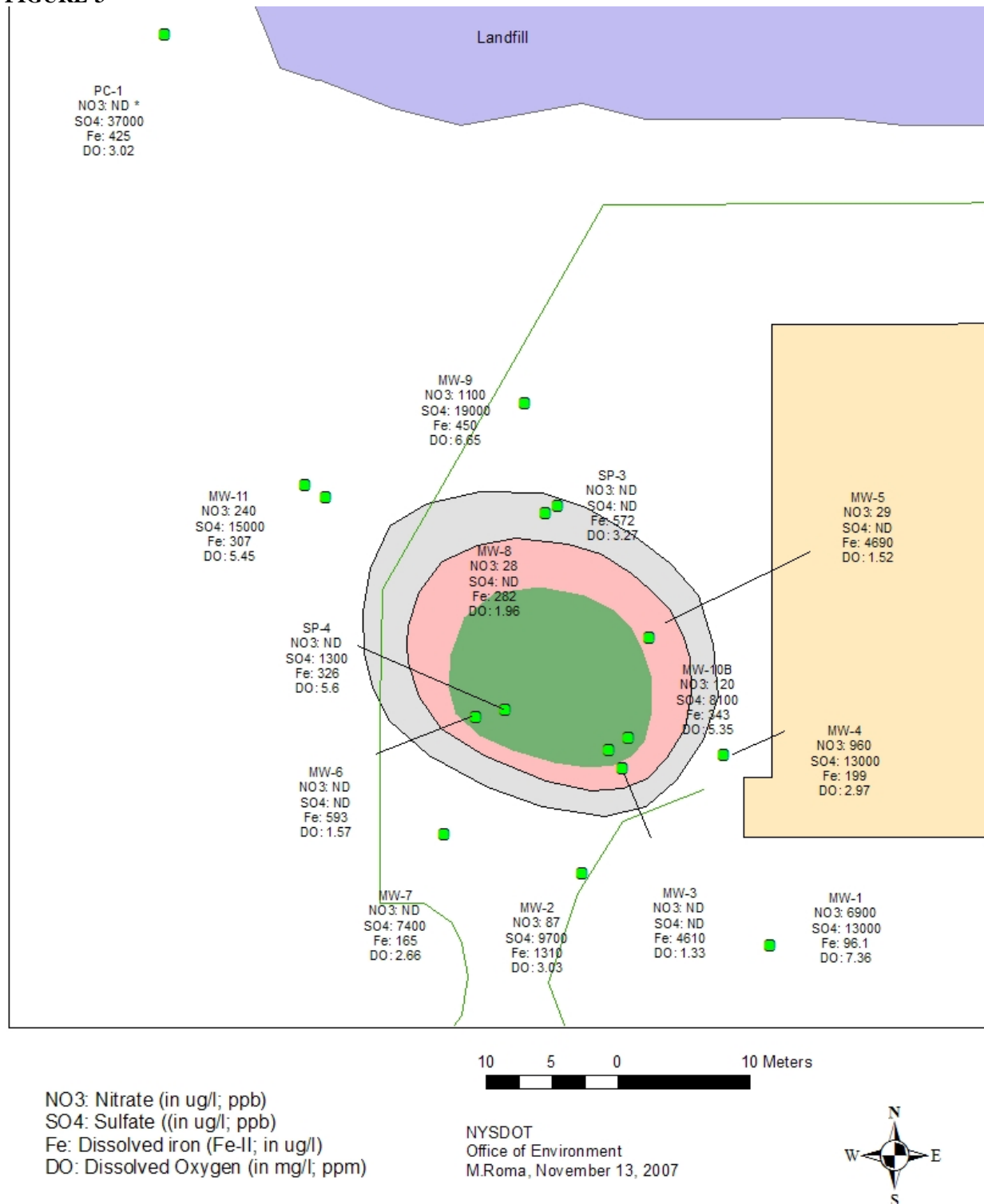
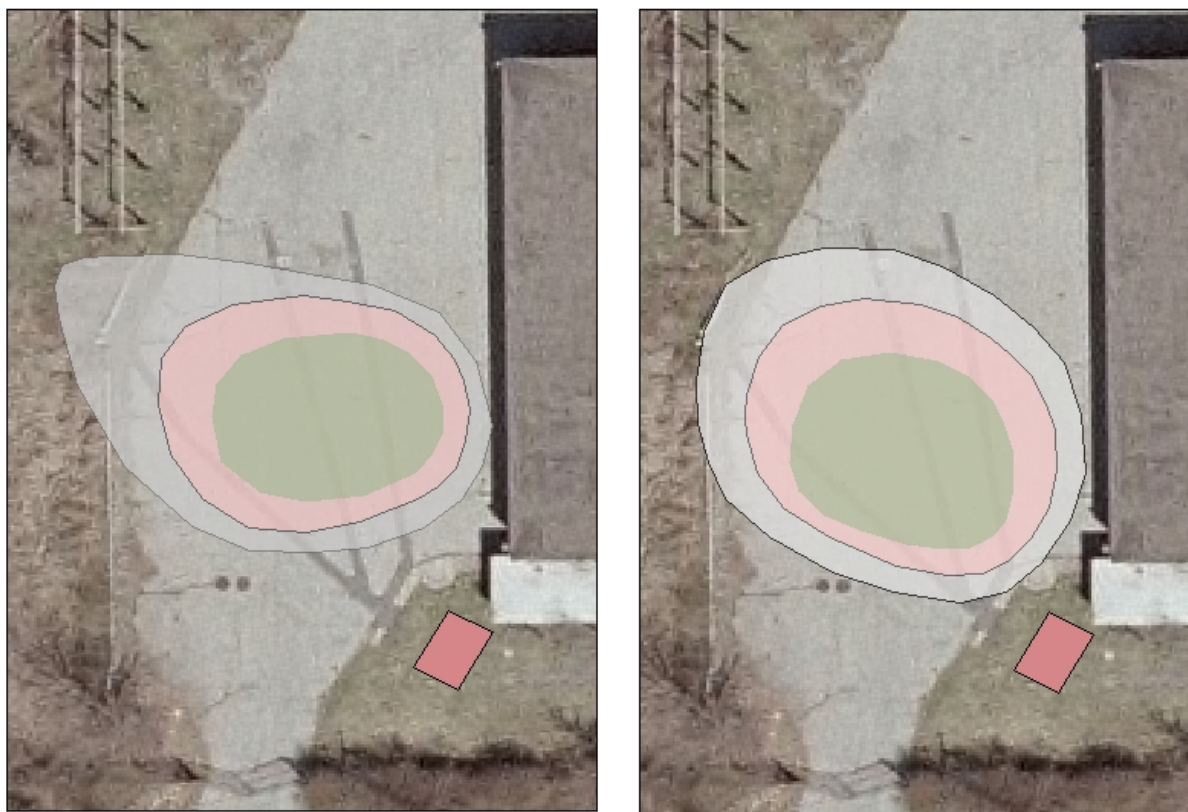


FIGURE-3



**NYSDOT HARRISON SUBRESIDENCY, WESTCHESTER CO.
Bio-Indicators in groundwater (July 2007).**

FIGURE-4



October 2005 / March 2006

July 2007

10 5 0 10 Meters

Legend

- > 25 ppb BTEX & MTBE
- > 50 ppb BTEX & MTBE
- > 100 ppb BTEX & MTBE (<500ppb)
- Former UST location (apprx.)

NOTE: BTEX stands for benzene, toluene ethyl-benzene, and xylenes. No MTBE has been detected since September 2003

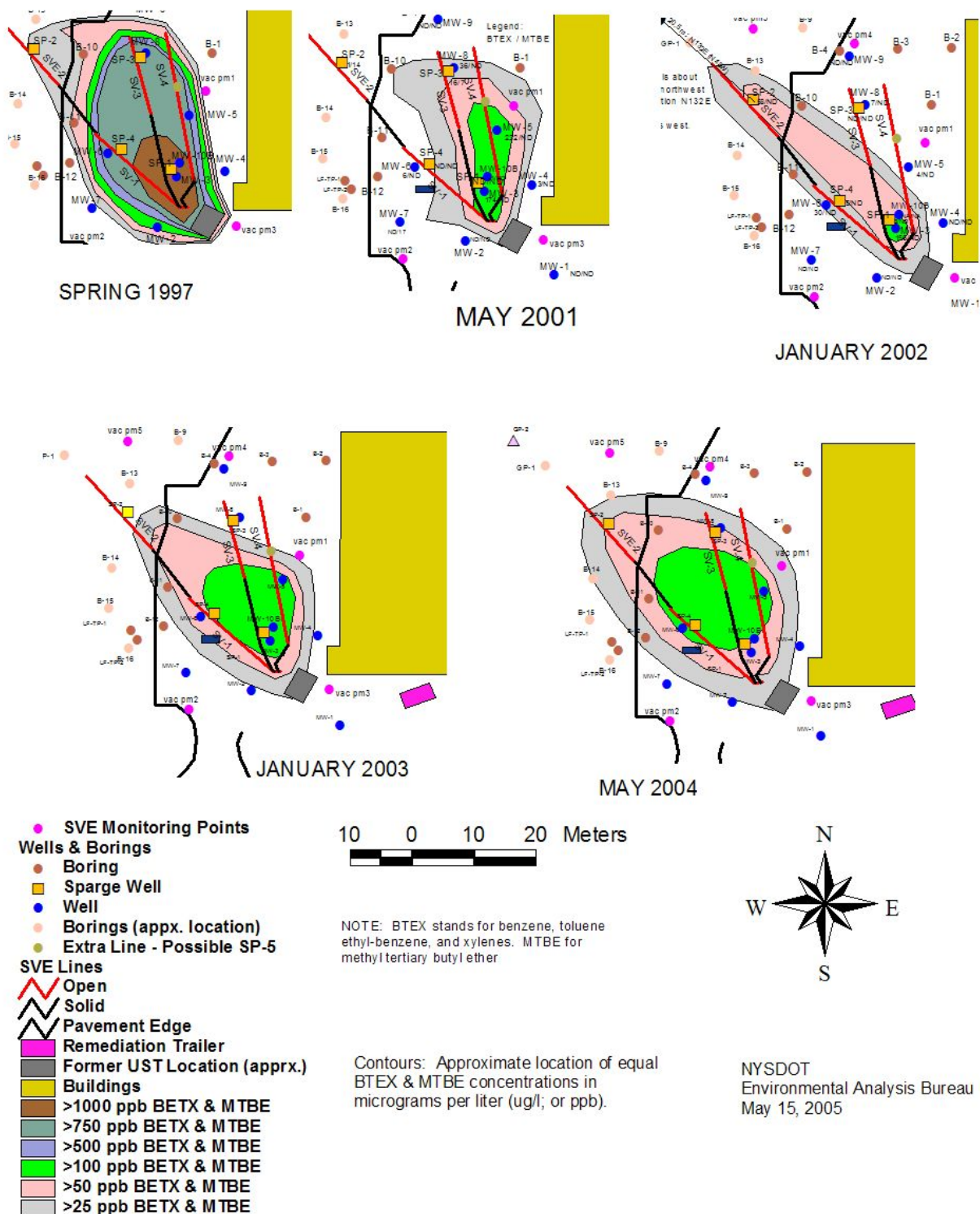
Plume Contours: Approximate location of equal BTEX concentrations in micrograms per liter (ug/l or ppb)



NYSDOT
Office of Environment
M.Roma, November 13, 2007

**NYSDOT HARRISON SUBRESIDENCY, WESTCHESTER CO.
Petroleum (BTEX) Contaminant Plume at
the Water Table (Oct. 2005/March 2006 & July 2007).**

FIGURE-5



Harrison Subresidency, Westchester County. Petroleum (BTEX & MTBE) Contaminant Plume at the Water Table Wells, Borings, and Soil Vapor Extraction Lines

ATTACHMENT A
MONITORING WELL DATA SUMMARY
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Harrison Subresidency Spill Site

WELL ID: MW 1	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	ND	54	ND	ND	ND	ND	ND	ND	ND	50
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
m,p-Xylene	ND	ND	-	-	ND	ND	ND	ND	ND	-
O-Xylene	ND	ND	-	-	ND	ND	ND	ND	ND	-
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
TOTAL BTEX	ND	ND	ND	ND	ND	ND	ND	ND	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	-	-	♦	25
Metals (ug/L)										
Chloride	7,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	27,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	ND	♦	207	3,760	264	♦	♦	5810	4840	300
Iron (dissolved)	ND	♦	ND	298	35	85.1 B	56.5 B	58 B	96.1 B	300
Lead	ND	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	4,100	♦	11,000	3,000	7,700	6,200	6,800	6,200	6,900	10,000
Sulfate (ug/L)	15,000	♦	13,000	17,000	15,000	17,000	14,000	17,000	13,000	250,000
TOC (ug/L)	4,000	♦	9,000	8,000	ND	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	97,400	♦	59,000	42,000	30,000	16,000	45,000 H	56,000	73,000	N/A
Dissolved Oxygen (mg/L)	3.6	1.97	6.42	8.3	2.5	3.89	4.2	5.9	7.36	N/A

WELL ID: MW 2	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	5.5	15	ND	ND	ND	ND	ND	ND	ND	50
Benzene	2.1	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	8.0	2	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	2.7	ND	ND	ND	ND	ND	ND	ND	ND	-
m,p-Xylene	ND	-	-	-	ND	ND	ND	ND	ND	-
O-Xylene	3.8	-	-	-	ND	ND	ND	ND	ND	-
Xylenes (total)	3.8	2	ND	ND	ND	ND	ND	ND	ND	-
TOTAL BTEX	16.6	4	ND	ND	ND	ND	ND	ND	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	10,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	22,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	6,330	75,600	10,400	♦	♦	3780	12,800	300
Iron (dissolved)	♦	♦	646	4,240	2,770	5,860	6,780	187	1,310	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND	ND *	81	58	70	230	87	10,000
Sulfate (ug/L)	♦	♦	14,000	150,000	25,000	15,000	15,000	26,000	9,700	250,000
TOC (ug/L)	♦	♦	17,000	18,000	ND	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	49,000	40,000	23,000	33,000	43,000 H	46,000	51,000	N/A
Dissolved Oxygen (mg/L)	2.6	3.08	4.23	3.6	1.5	1.07	1.3	1.7	3.03	N/A

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WELL ID: MW 3	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	50	21	ND	ND	ND	ND	ND	ND	ND	50
Benzene	64	ND	2	3	ND	ND	ND	ND	ND	-
Toluene	21	ND	2	3	ND	ND	ND	ND	1J	-
Ethylbenzene	350	ND	ND	40	82	120	61	ND	82	-
m,p-Xylene	460	-	-	-	44	56	15	20	10	-
O-Xylene	65	-	-	-	6	5	1J	2J	ND	-
Xylenes (total)	525	2	170	110	50	61	16	22	10	-
TOTAL BTEX	960.0	2	174	156	132	181	77	22	93	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene	♦		ND	♦	♦	♦	♦	♦	♦	50
Napthalene	160		4 J	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	24,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	43,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	18,000	♦	8,880	35,100	14,400	♦	♦	20,800	17,200	300
Iron (dissolved)	ND	♦	2,410	4,000	7,250	6,870	7,030	5,260	4,610	300
Lead	8	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	ND	♦	ND	ND *	ND	ND	ND	32	ND	10,000
Sulfate (ug/L)	ND	♦	18,000	24,000	27,000	6,500	7,300	14,000	ND	250,000
TOC (ug/L)	10,000	♦	27,000	70,000	6,300	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	9,200	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	105,000	♦	48,000	70,000	45,000	84,000	51,000 H	61,000	65,000	N/A
Dissolved Oxygen (mg/L)	2.1	2.93	1.89	3.0	1.1	1.36	1.04	1.26	1.33	N/A

WELL ID: MW 4	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	13	3	ND	ND	ND	ND	ND	ND	ND	50
Benzene	4.4	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	22	2	2	ND	16	ND	1 J	2J	ND	-
m,p-Xylene	♦	-	-	-	1	ND	ND	ND	ND	-
O-Xylene	♦	-	-	-	ND	ND	ND	ND	ND	-
Xylenes (total)	13	ND	1	ND	1	ND	ND	ND	ND	-
TOTAL BTEX	39.4	2	3	ND	17	ND	1	2	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	8,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	22,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	1,360	1,330	3,480	♦	♦	307	14,600	300
Iron (dissolved)	♦	♦	1,010	ND	2,740	61.0 B	635	55.1 B	199B	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND	3,200	ND	2400	530	450	960	10,000
Sulfate (ug/L)	♦	♦	15,000	22,000	21,000	18,000	13,000	13,000	13,000	250,000
TOC (ug/L)	♦	♦	14,000	13,000	44,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	55,000	40,000	55,000	21,000	65,000 H	98,000	91,000	N/A
Dissolved Oxygen (mg/L)	3.5	2.35	4.29	3.9	0.82	1.42	2	1.6	2.97	N/A

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WELL ID: MW 5	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	150	ND	ND	ND	ND	ND	ND	ND	ND	50
Benzene	14	ND	1	ND	ND	ND	ND	ND	ND	-
Toluene	32	2	2	ND	2	ND	ND	1J	ND	-
Ethylbenzene	410	ND	ND	ND	150	ND	99	140	75	-
m,p-Xylene	♦	-	-	-	93	ND	42	46	12	-
O-Xylene	♦	-	-	-	5	ND	2J	3J	ND	-
Xylenes (total)	460	43	230	4	98	ND	44	49	12	-
TOTAL BTEX	916	45	233	4	250	ND	143	190	87	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			10	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	60,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	32,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	9,630	3,910	4,500	♦	♦	9770	9,830	300
Iron (dissolved)	♦	♦	2,930	1,820	1,240	7,070	4,560	6,100	4,690	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND	620	210	ND	ND	220	29	10,000
Sulfate (ug/L)	♦	♦	17,000	12,000	16,000	42,000	8,500	ND	ND	250,000
TOC (ug/L)	♦	♦	23,000	14,000	12,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	68,000	12,000	28,000	100,000	73,000 H	74,000	ND	N/A
Dissolved Oxygen (mg/L)	3.4	3.09	6.12	9.0	1.6	1.19	1.73	1.23	1.52	N/A

WELL ID: MW 6	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	73	20	ND	ND	ND	ND	ND	ND	ND	50
Benzene	7.9	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	7	ND	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	98	ND	ND	3	61	ND	88	16	100	-
m,p-Xylene	♦	-	-	-	30	14	37	27	28	-
O-Xylene	♦	-	-	-	2	1	3J	4J	3J	-
Xylenes (total)	112	21	6	27	33	16	40	31	31	-
TOTAL BTEX	224.9	21	6	30	94	16	128	47	131	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	40,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	33,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	1,720	2,410	2,750	♦	♦	4610	5,630	300
Iron (dissolved)	♦	♦	475	2,060	874	1,080	1,620	1,270	593	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND	ND *	ND	ND	ND	ND	ND	10,000
Sulfate (ug/L)	♦	♦	17,000	19,000	22,000	10,000	7,400	7,200	ND	250,000
TOC (ug/L)	♦	♦	17,000	25,000	ND	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	60,000	32,000	27,000	33,000	48,000	45,000	49,000	N/A
Dissolved Oxygen (mg/L)	3.1	6.05	4.1	3.5	0.89	1.41	2.9	3.3	1.57	N/A

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WELL ID: MW 7	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	16	38	17	ND	ND	ND	ND	ND	ND	50
Benzene	3.4	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	4	ND	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	5.7	ND	ND	ND	ND	ND	ND	ND	ND	-
m,p-Xylene	♦	-	-	-	ND	ND	ND	ND	ND	-
O-Xylene	♦	-	-	-	ND	ND	ND	ND	ND	-
Xylenes (total)	4.8	ND	ND	ND	ND	ND	ND	ND	ND	-
TOTAL BTEX	17.9	ND	ND	ND	ND	ND	ND	ND	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	40,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	35,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	2,700	30,000	3,080	♦	♦	3960	18,000	300
Iron (dissolved)	♦	♦	1,880	4,020	2,380	2,190	2,640	1,600	165B	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND	ND*	150	ND	160	330	ND	10,000
Sulfate (ug/L)	♦	♦	15,000	38,000	20,000	8,200	13,000	11,000	7,400	250,000
TOC (ug/L)	♦	♦	16,000	21,000	11,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	78,000	35,000	37,000	27,000	42,000	63,000	41,000	N/A
Dissolved Oxygen (mg/L)	3.2	3.12	4.43	3.4	1.0	2.2	1.8	2.0	2.66	N/A

WELL ID: MW 8	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	68	6	ND	ND	ND	ND	ND	ND	ND	50
Benzene	110	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	26	ND	2	ND	ND	ND	2 J	ND	ND	-
Ethylbenzene	60	ND	ND	ND	2	1	41	2J	27	-
m,p-Xylene	160	-	-	-	1	ND	12	7	5	-
O-Xylene	40	-	-	-	ND	ND	2 J	2J	2J	-
Xylenes (total)	200	ND	34	7	1	ND	14	9	7	-
TOTAL BTEX	396	ND	36	7	3	1	57	11	34	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene	♦		ND	♦	♦	♦	♦	♦	♦	50
Napthalene	34		ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	5,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	63,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	8,600	♦	545	4,370	3,320	♦	♦	7160	4,070	300
Iron (dissolved)	230	♦	ND	48.7 B	ND	1,890	3,310	3,160	282	300
Lead	ND	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	33	♦	ND	ND *	190	ND	ND	120	28	10,000
Sulfate (ug/L)	ND	♦	31,000	ND	ND	ND	3,800	ND	ND	250,000
TOC (ug/L)	12,000	♦	21,000	25,000	ND	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	7,600	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	264,000	♦	37,000	22,000	19,000	30,000	56,000	55,000	42,000	N/A
Dissolved Oxygen (mg/L)	1.5	6.3	4.6	4.5	0.89	0.88	2.18	3.13	1.96	N/A

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WELL ID: MW 9	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
m,p-Xylene	♦	-	-	-	ND	ND	ND	ND	ND	-
O-Xylene	♦	-	-	-	ND	ND	ND	ND	ND	-
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
TOTAL BTEX	ND	ND	ND	ND	ND	ND	ND	ND	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			2 J	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	260,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	160,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	4,570	7,870	12,600	♦	♦	232	16,000	300
Iron (dissolved)	♦	♦	ND	ND	ND	32.2 B	ND	44.9 B	450	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND	690	340	730	870	770	1,100	10,000
Sulfate (ug/L)	♦	♦	21,000	23,000	19,000	12,000	12,000	17,000	19,000	250,000
TOC (ug/L)	♦	♦	18,000	15,000	9,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	ND	ND *	ND	ND	ND	ND	ND	N/A
Dissolved Oxygen (mg/L)	3.3	7.5	5.49	12.3	6.30	3.65	7.60	8.20	6.65	N/A

WELL ID: MW 11								(Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE								ND	ND	50
Benzene								ND	ND	-
Toluene								1 J	ND	-
Ethylbenzene								10	3J	-
m,p-Xylene								7	ND	-
O-Xylene								ND	ND	-
Xylenes (total)								7	ND	-
TOTAL BTEX								18	3	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene								♦	♦	50
Napthalene								♦	♦	25
Metals (ug/L)										
Chloride								♦	♦	250,000
Sodium								♦	♦	20,000
Iron (total)								174,000	23,400	300
Iron (dissolved)								1370	307	300
Lead								♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)								0.98	240	10,000
Sulfate (ug/L)								57,000	15,000	250,000
TOC (ug/L)								♦	♦	N/A
Petroleum Hydrocarbons (ug/L)								♦	♦	N/A
Carbon Dioxide (ug/L)								230,000	140,000	N/A
Dissolved Oxygen (mg/L)								3.70	5.45	N/A

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WELL ID: SP 1	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	3.2	31	ND	ND	ND	♦	♦	♦	♦	50
Benzene	1.4	ND	ND	ND	ND	♦	♦	♦	♦	-
Toluene	3.7	ND	ND	ND	60	♦	♦	♦	♦	-
Ethylbenzene	4.0	ND	ND	2	22	♦	♦	♦	♦	-
m,p-Xylene	8.1	-	-	-	100	♦	♦	♦	♦	-
O-Xylene	2.9	-	-	-	42	♦	♦	♦	♦	-
Xylenes (total)	11.0	ND	ND	1	140	♦	♦	♦	♦	-
TOTAL BTEX	20.1	ND	ND	3	222	♦	♦	♦	♦	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	16,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	45,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	3,940	3,720	NA	♦	♦	♦	♦	300
Iron (dissolved)	♦	♦	52.1 B	68.0 B	NA	♦	♦	♦	♦	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND*	160	NA	♦	♦	♦	♦	10,000
Sulfate (ug/L)	♦	♦	48,000	46,000	NA	♦	♦	♦	♦	250,000
TOC (ug/L)	♦	♦	25,000	17,000	ND	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	NA	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	18,000	19,000	NA	♦	♦	♦	♦	N/A
Dissolved Oxygen (mg/L)	4.6	9.66	4.6	2.3	NA	♦	♦	♦	♦	N/A

WELL ID: MW 10 B	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	4.9	♦	ND	NA	ND	ND	ND	ND	ND	50
Benzene	2.1	♦	ND	NA	ND	ND	ND	ND	ND	-
Toluene	ND	♦	ND	NA	ND	ND	ND	ND	ND	-
Ethylbenzene	ND	♦	1	NA	9	23	8	ND	9	-
m,p-Xylene	3.5	♦	-	NA	2	15	2 J	ND	2J	-
O-Xylene	5.6	♦	-	NA	ND	ND	ND	ND	ND	-
Xylenes (total)	9.1	♦	ND	NA	2	15	2 J	ND	2	-
TOTAL BTEX	11.2	♦	1	NA	11	38	10	ND	11	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	NA	♦	♦	♦	♦	♦	50
Napthalene			ND	NA	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	34,000	♦	♦	NA	♦	♦	♦	♦	♦	250,000
Sodium	27,000	♦	♦	NA	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	1,080	NA	1,190	♦	♦	1460	1,880	300
Iron (dissolved)	♦	♦	32.8 B	NA	462	644	592	456	343	300
Lead	♦	♦	♦	NA	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND*	NA	ND	ND	120	ND	120	10,000
Sulfate (ug/L)	♦	♦	27,000	NA	19,000	9,000	12,000	12,000	8,100	250,000
TOC (ug/L)	♦	♦	14,000	NA	9,400	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	NA	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	39,000	NA	39,000	25,000	32,000	25,000	14,000	N/A
Dissolved Oxygen (mg/L)	4.7		4.91	NA	2.0	2.9	2.4	1.1	5.35	N/A

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WELL ID: SP 2	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	18	♦	14	ND	ND	ND	ND	♦	♦	50
Benzene	19	♦	ND	7	7	5	2 J	♦	♦	-
Toluene	25	♦	ND	6	2	2	4 J	♦	♦	-
Ethylbenzene	110	♦	1	42	ND	5	42	♦	♦	-
m,p-Xylene	52	♦	-	-	4	1	13	♦	♦	-
O-Xylene	11	♦	-	-	2	ND	ND	♦	♦	-
Xylenes (total)	63	♦	ND	3	6	1	13	♦	♦	-
TOTAL BTEX	217.0	♦	1	58	15	13	61	♦	♦	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	36,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	75,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	9,750	7,590	2,700	♦	♦	♦	♦	300
Iron (dissolved)	♦	♦	ND	126 B	ND	166 B	2,120	♦	♦	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND*	100	ND	37	ND	♦	♦	10,000
Sulfate (ug/L)	♦	♦	26,000	64,000	18,000	7,900	7,200	♦	♦	250,000
TOC (ug/L)	♦	♦	17,000	29,000	14,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	36,000	42,000	38,000	37,000	58,000	♦	♦	N/A
Dissolved Oxygen (mg/L)	2.5	♦	3.1	4.0	1.0	1.47	1.7	♦	♦	N/A

WELL ID: SP 3	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	38	♦	7	ND	ND	ND	ND	ND	ND	50
Benzene	110	♦	ND	ND	ND	ND	ND	ND	ND	-
Toluene	39	♦	1	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	200	♦	ND	ND	ND	ND	ND	ND	31	-
m,p-Xylene	180	♦	-	-	ND	ND	ND	ND	4J	-
O-Xylene	57	♦	-	-	ND	ND	ND	ND	3J	-
Xylenes (total)	237	♦	15	ND	ND	ND	ND	ND	7	-
TOTAL BTEX	586.0	♦	16	ND	ND	ND	ND	ND	38	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene			ND	♦	♦	♦	♦	♦	♦	50
Napthalene			ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	6,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	38,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	2,970	1,060	133 B	♦	♦	3380	3,170	300
Iron (dissolved)	♦	♦	ND	ND	ND	116 B	384	891	572	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND*	100	ND	25	66	ND	ND	10,000
Sulfate (ug/L)	♦	♦	56,000	16,000	19,000	5,900	22,000	ND	ND	250,000
TOC (ug/L)	♦	♦	11,000	18,000	41,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	11,000	11,000	20,000	19,000	26,000	57,000	32,000	N/A
Dissolved Oxygen (mg/L)	3.4	♦	4.21	5.7	1.1	1.7	2.2	1.05	3.27	N/A

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WELL ID: SP 4	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	24	♦	ND	ND	ND	ND	ND	ND	ND	50
Benzene	24	♦	ND	ND	ND	ND	ND	ND	ND	-
Toluene	3.8	♦	ND	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	35	♦	ND	3	26	ND	ND	ND	ND	-
m,p-Xylene	9.5	♦	-	-	8	ND	ND	ND	ND	-
O-Xylene	2.4	♦	-	-	ND	ND	ND	ND	ND	-
Xylenes (total)	11.9	♦	ND	2	8	ND	ND	ND	ND	-
TOTAL BTEX	74.7	♦	ND	5	34	ND	ND	ND	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene		♦	ND	♦	♦	♦	♦	♦	♦	50
Napthalene		♦	ND	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	16,000	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	24,000	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	3,790	5,350	2,490	♦	♦	10,400	25,400	300
Iron (dissolved)	♦	♦	602	1,810	1,810	2,460	44.5	953	326	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	ND*	ND*	ND	ND	150	200	ND	10,000
Sulfate (ug/L)	♦	♦	34,000	22,000	37,000	26,000	8,400	24,000	13,000	250,000
TOC (ug/L)	♦	♦	14,000	24,000	11,000	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	39,000	24,000	31,000	26,000	23,000	39,000	ND	N/A
Dissolved Oxygen (mg/L)	4.2	♦	6.89	4.2	2.4	6.2	3.4	3.8	5.6	N/A

WELL ID: GP 2	BASELINE (May 2000)	(Jan 2001)	(May 2001)	(Jan 2002)	(Jan 2003)	(Sept 2003)	(May 2004)	(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	♦	♦	♦	♦	3	ND	ND	♦	♦	50
Benzene	♦	♦	♦	♦	ND	ND	ND	♦	♦	-
Toluene	♦	♦	♦	♦	ND	ND	ND	♦	♦	-
Ethylbenzene	♦	♦	♦	♦	ND	ND	ND	♦	♦	-
m,p-Xylene	♦	♦	♦	♦	ND	ND	ND	♦	♦	-
O-Xylene	♦	♦	♦	♦	ND	ND	ND	♦	♦	-
Xylenes (total)	♦	♦	♦	♦	ND	ND	ND	♦	♦	-
TOTAL BTEX	♦	♦	♦	♦	3	ND	ND	♦	♦	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene	♦	♦	♦	♦	♦	♦	♦	♦	♦	50
Napthalene	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	♦	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	♦	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	♦	♦	♦	♦	♦	♦	♦	300
Iron (dissolved)	♦	♦	♦	♦	♦	♦	♦	♦	♦	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	10,000
Sulfate (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	250,000
TOC (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Dissolved Oxygen (mg/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A

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WELL ID: PC-1								(Oct 2005)/ (Mar 2006)	(July 2007)	TARGET EFFLUENT CRITERIA
Volatile Organics (ug/L)										
MTBE	♦	♦	♦	♦	♦	♦	♦	ND	ND	50
Benzene	♦	♦	♦	♦	♦	♦	♦	ND	ND	-
Toluene	♦	♦	♦	♦	♦	♦	♦	ND	ND	-
Ethylbenzene	♦	♦	♦	♦	♦	♦	♦	ND	ND	-
m,p-Xylene	♦	♦	♦	♦	♦	♦	♦	ND	ND	-
O-Xylene	♦	♦	♦	♦	♦	♦	♦	ND	ND	-
Xylenes (total)	♦	♦	♦	♦	♦	♦	♦	ND	ND	-
TOTAL BTEX	♦	♦	♦	♦	♦	♦	♦	ND	ND	100
Semi-volatile Org.(ug/L)										
2-Methylnaphthalene	♦	♦	♦	♦	♦	♦	♦	♦	♦	50
Napthalene	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Metals (ug/L)										
Chloride	♦	♦	♦	♦	♦	♦	♦	♦	♦	250,000
Sodium	♦	♦	♦	♦	♦	♦	♦	♦	♦	20,000
Iron (total)	♦	♦	♦	♦	♦	♦	♦	599	952	300
Iron (dissolved)	♦	♦	♦	♦	♦	♦	♦	28.6 B	425	300
Lead	♦	♦	♦	♦	♦	♦	♦	♦	♦	25
Other										
Nitrogen, Nitrate (ug/L)	♦	♦	♦	♦	♦	♦	♦	50	ND*	10,000
Sulfate (ug/L)	♦	♦	♦	♦	♦	♦	♦	5000	37,000	250,000
TOC (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Petroleum Hydrocarbons (ug/L)	♦	♦	♦	♦	♦	♦	♦	♦	♦	N/A
Carbon Dioxide (ug/L)	♦	♦	♦	♦	♦	♦	♦	10,000	35,000	N/A
Dissolved Oxygen (mg/L)	♦	♦	♦	♦	♦	♦	♦	2.72	3.02	N/A
Notes: ND = Non Detect B = Concentration below the reporting limit equal to or above the detection limit. J = Concentration below the reporting limit. H = Analyzed outside of the holding time. * Nitrogen, Nitrate was analyzed outside the recommended holding time for this sample and therefore the analytical results may be biased low.										

LMS

Well ID No.: MW-1

Sample Analyses: See COC

Comments:

** Note: Measurements not in-line.

Well Sampling Log

Well ID No.: MW-2

Well Casing Type: 4" PVC

Start SWL: 6.11

Project: NYSDOT Harrison Spill Site

Well Depth:** 10.82'

Water Column Ht.: 4.71

Date: 7/10/2007

Screened Interval: N/A

Well Casing Volume (gallons): 4.2

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 6.3

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1640

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

Well Sampling Log

Well ID No.: MW-3

Well Casing Type: 4" PVC

Start SWL: 6.20

Project: NYSDOT Harrison Spill Site

Well Depth:** 10.72'

Water Column Ht.: 4.52

Date: 7/10/2007

Screened Interval: N/A

Well Casing Volume (gallons): 4.1

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 6.5

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1650

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

LMS Well Sampling Log

Well ID No.: MW-4

Well Casing Type: 4" PVC

Start SWL: 6.00

Project: NYSDOT Harrison Spill Site

Well Depth:** 11.9'

Water Column Ht.: 5.9

Date: 7/10/2007

Screened Interval: N/A

Well Casing Volume (gallons): 5.3

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 6.53

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1700

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

LMS Well Sampling Log

Well ID No.: MW-5

Well Casing Type: 4" PVC

Start SWL: 6.20

Project: NYSDOT Harrison Spill Site

Well Depth:** 10.95'

Water Column Ht.: 4.75

Date: 7/10/2007

Screened Interval: N/A

Well Casing Volume (gallons): 4.3

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 6.3

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1710

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

Well Sampling Log

Well ID No.: MW-6

Well Casing Type: 4" PVC

Start SWL: 7.44

Project: NYSDOT Harrison Spill Site

Well Depth:** 14.65'

Water Column Ht.: 7.21

Date: 7/11/2007

Screened Interval: N/A

Well Casing Volume (gallons): 6.50

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 7.36

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1210

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

Well Sampling Log

Well ID No.: MW-7

Well Casing Type: 4" PVC

Start SWL: 6.36

Project: NYSDOT Harrison Spill Site

Well Depth:** 14.6'

Water Column Ht.: 8.24

Date: 7/11/2007

Screened Interval: N/A

Well Casing Volume (gallons): 7.4

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 6.52

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1220

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

Well Sampling Log

Well ID No.: MW-8

Well Casing Type: 4" PVC

Start SWL: 8.35

Project: NYSDOT Harrison Spill Site

Well Depth:** 14.5'

Water Column Ht.: 6.15

Date: 7/11/2007

Screened Interval: N/A

Well Casing Volume (gallons): 5.5

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 8.8

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1240

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good+

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

+Note: Well cover bolts are missing.

LMS Well Sampling Log

Well ID No.: MW-9

Well Casing Type: 2" PVC

Start SWL: 4.82

Project: NYSDOT Harrison Spill Site**Well Depth**:** 13.86'**Water Column Ht.: 9.04**

Date: 7/11/2007

Screened Interval: N/A

Well Casing Volume (gallons): 8.1

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 5.73

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1420

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

LMS Well Sampling Log

Well ID No.: MW-11

Well Casing Type: 2" PVC

Start SWL: 11.35

Project: NYSDOT Harrison Spill Site

Well Depth:** 15.0'

Water Column Ht.: 3.65

Date: 7/11/2007

Screened Interval: 5 to 15 ft.

Well Casing Volume (gallons): 3.3

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 11.52

Purge Method: Whale Pump

Ground Elevation: N/A

Sample Time: 1500

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Dedicated Bailer**

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

** Note: Measurements not in-line.

LMS Well Sampling Log

Well ID No.: PC-1

Well Casing Type: 2" PVC Piezometer

Start SWL: 8.90

Project: NYSDOT Harrison Spill Site

Well Depth:** 16.93'

Water Column Ht.: 8.03

Date: 7/12/2007

Screened Interval: N/A

Well Casing Volume (gallons): 7.2

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 9.1

Purge Method: Peristaltic Pump

Ground Elevation: N/A

Sample Time: 1100

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Peri Pump

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

Well Sampling Log

Well ID No.: SP-3

Well Casing Type: 1.5" PVC

Start SWL: 8.15

Project: NYSDOT Harrison Spill Site

Well Depth:** 19.3'

Water Column Ht.: 11.15

Date: 7/11/2007

Screened Interval: N/A

Well Casing Volume (gallons): 5.4

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 8.15

Purge Method: Peristaltic Pump

Ground Elevation: N/A

Sample Time: 1300

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Peri Pump

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

LMS Well Sampling Log

Well ID No.: SP-4

Well Casing Type: 1.5" PVC

Start SWL: 6.6

Project: NYSDOT Harrison Spill Site

Well Depth:** 21'

Water Column Ht.: 14.4

Date: 7/11/2007

Screened Interval: N/A

Well Casing Volume (gallons): 7.2

Crew: TMS/BG

Well Elevation:** N/A

SWL During Sampling: 7.34

Purge Method: Peristaltic Pump

Ground Elevation: N/A

Sample Time: 1440

Meters Used: YSI Multi-Meter (low flow in-line measurements)

Well Condition: Good

Sample Method: Peri Pump

PID Head Space (ppm): Background

Weather Conditions: Fair/Warm

Sample Analyses: See COC

[illegible]

Comments:

Notes: Volume is measured in Gallons

* - Measurement taken from top of well casing

**ATTACHMENT-C: HARRISON SUBRESIDENCY, WESTCHESTER COUNTY. STATUS REPORT.
November 2007**

Current Situation

The Harrison DOT Subresidency, formerly a seasonal highway maintenance / salt storage facility, and now a Town composting facility, has two environmental concerns: 1) a 2.6 acre landfill, that was investigated, regraded and capped in accordance to New York State Department of Environmental Conservation (DEC) requirements, and 2) a petroleum spill which is being remediated (Figure-1). Extensive testing (surface water, groundwater, sediment, landfill gas, petroleum-remediation gas emissions) results indicate that these areas do not represent a significant threat to the environment, including the nearby Kensico Reservoir.

Background

This facility was built in 1967 to support the construction and operation of Interstate 684. Roadside and highway construction debris were disposed in a landfill between 1967 to approximately 1976. The area was fenced in 1972. In April 1993 a 55-gallon drum of road striping paint was removed from the landfill during a test pit excavation. Because the paint contained toluene (a solvent), the site was placed on the New York State Registry of Inactive Hazardous Waste Sites.

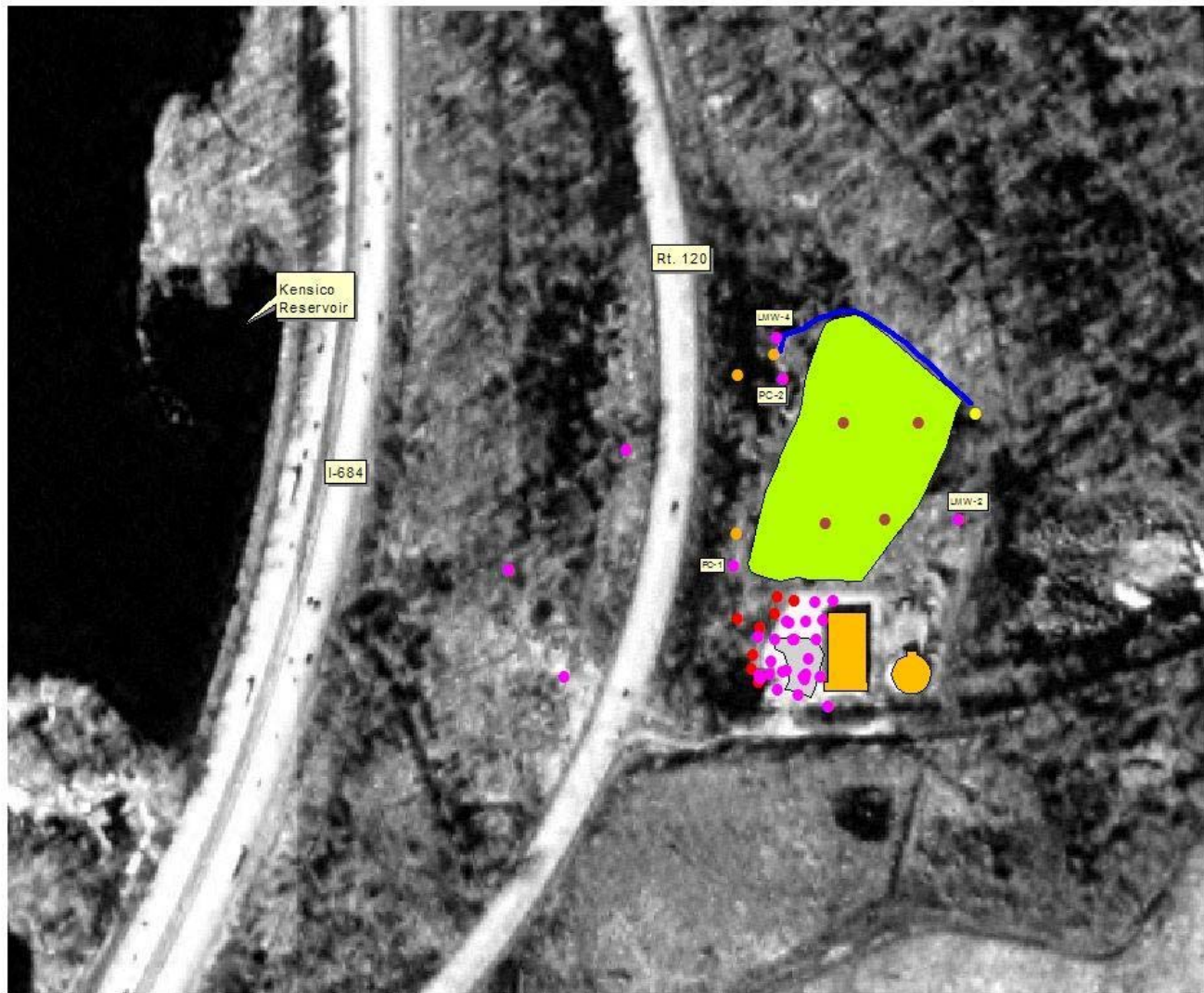
The DOT consulted with the DEC and the New York State Department of Health (DOH) and performed an expedited, comprehensive investigation (Preliminary Site Assessment; PSA) of the landfill and its vicinity in 1995. Several drums containing hazardous or suspected hazardous waste, mostly paint products, were encountered and removed from the landfill. The DOT also identified a petroleum spill at the vicinity of the fuel tank area. Based on investigation results, the DEC, DOH and DOT indicated that the landfill was not a significant threat to the reservoir. Petroleum spill monitoring results also suggested that the spill had not migrated off-site and was not a significant threat to the reservoir either. Figure-C1 shows the location of monitoring points.

After consulting with the DEC, DOH, and the New York City Department of Environmental Protection (DEP), the landfill was capped as per stringent DEC landfill closure requirements on August 31, 1999. The cap includes a durable polyethylene liner to prevent the infiltration of water and subsequent leaching of contaminants into the environment. A small stream that drains into the reservoir has been rerouted around the landfill (Figure-C1) so that it can not act as a collector trench for contaminants. The plastic liner extends beneath the repositioned stream, so that any leachate generated within the fill cannot discharge into surface water. Environmental monitoring results show no evidence of toxic contaminants from the landfill with the potential of reaching the reservoir.

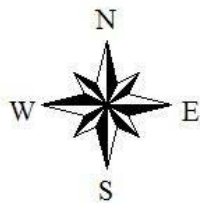
The petroleum spill has affected groundwater and, with DEC approval, we removed three underground petroleum storage tanks, contaminated soil and water in August 1994. Using GIS, we (DOT & DEC) designed the remedial system. On October 31, 2000 we started operating air sparging wells and soil gas vapor extraction lines. Our system achieved about a 90% overall reduction of contaminants in less than a year due to volatilization and bioremediation of the petroleum product (Figure 5). Mapping of the well locations, using 2-3 ft. positional accuracy GPS, resulted in adequate mapping of the contaminant plume. This was critical for the successful design of the remedial system. We closed the system in October 2002. The spill is currently being degraded by bio-chemical processes (Figures 2-5).

The DOT periodically submits status reports to the DEC, DOH and DEP, and expects to do so for some years.

FIGURE-C1



NYSDOT
Environmental Analysis Bureau



- Landfill Gas Monitoring
- Sediment-, Surface Water- Monitoring
- Wells and Borings
- Borings (Approximate Location)
- Relocated Stream
- Buildings
- Petroleum Spill
- Landfill

90 0 90 Meters

HARRISON SUBRESIDENCY, WESTCHESTER CO. ENVIRONMENTAL MONITORING POINTS