2011 FOURTH QUARTER AND ANNUAL REPORT

Old Bethpage
Solid Waste Disposal Complex
Groundwater Treatment Facility

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK 11791

September 2012

LOCKWOOD
KESSLER &
BARTLETT, INC.
SYOSSET, NEW YORK 11791

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

A. Figures 1 through 3 from “Quarterly Monitoring Report, Fourth Quarter 2011 Results, Old Bethpage Landfill, Old Bethpage, New York”, Gannett Fleming, August 2012; and Figures 1 through 3 and Appendix B from “2011 Annual Monitoring Report, January Through December 2011, Old Bethpage Landfill, Old Bethpage, New York”, Gannett Fleming, August 2012

B. Figures 2.1 and 2.3, and Appendices A through C (Tables 4.1, 4.2 and 5.1, respectively) from “Town of Oyster Bay, Old Bethpage Solid Waste Disposal Complex, Evaluation of Volatile Organic Compounds in Ambient Air, Soil Gas and Soil Gas Pressure Readings, 2011 Annual Summary Report”, RTP Environmental Associates, Inc., June 2012

1.0 INTRODUCTION

This document is the Old Bethpage Landfill (Landfill) Remedial Action Plan (RAP) Report for the fourth calendar quarter of 2011 and calendar year 2011. This RAP Report was prepared on behalf of the Town of Oyster Bay (Town) by Lockwood, Kessler & Bartlett, Inc. (LKB). It is submitted to the New York State Department of Environmental Conservation (NYSDEC) pursuant to Consent Decree 83 Civ. 5357. The RAP is Appendix A of the Consent Decree.

Section D.1.b (Reporting, Quarterly Reports, Operating Period) of the RAP requires the Town to submit the following information on a quarterly basis:

- Pumpage records
- Treatment system air and water discharge data
- Treatment system performance records
- Data analysis (trends, position of plume, etc.)
- Modifications to system, including method and dates of approval
- Ground water-quality monitoring data
- Water-level data
- Potentiometric surface maps, as revised
- Records of all system downtime

Section D.2 (Reporting, Annual Operating Report) of the RAP requires the Town to also submit an annual operating report containing a summary and analysis of the information in the quarterly reports; and allows the Town to combine the fourth quarter report for each year and the annual report into this single RAP Report.

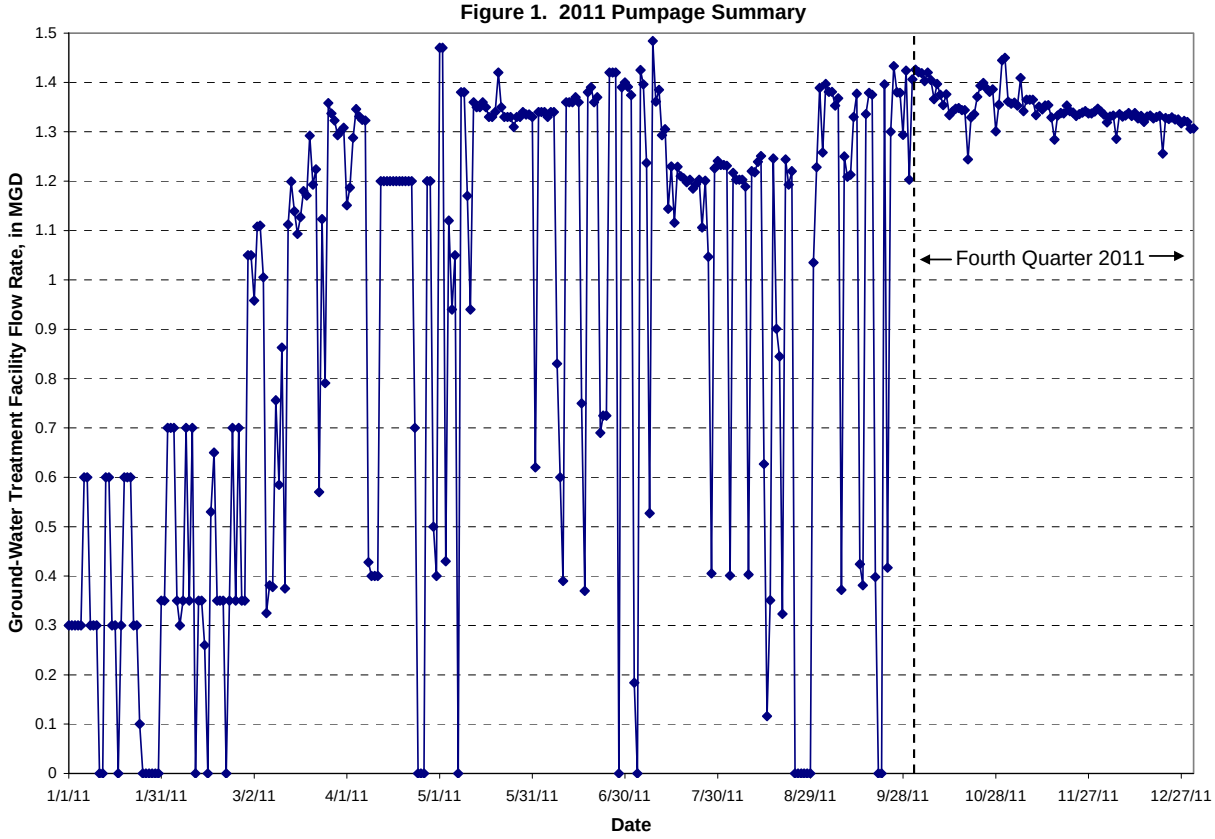
This information is summarized and evaluated in the Sections 2.0 and 3.0 below, first for the fourth quarter and then for all of 2011, and is supported by figures and/or tables, as appropriate. Conclusions and recommendations based on the findings are provided in Section 4.0. The actual data, records and monitoring consultants' reports are maintained by the Town per Consent Decree requirements, and can be provided upon request. Copies of selected figures and tables from the monitoring consultants' fourth quarter and/or annual summary reports are included in Appendices A and B, respectively, and are referred to below as appropriate.

2.0 STATUS OF GROUND-WATER REMEDIATION

2.1 Ground Water-Treatment Facility Operation

The facility was fully operational during the fourth quarter of 2011, with no significant downtime. During this period, the facility maintained an average flow rate of 1.35 MGD (Million Gallons per Day). The average flow rate for all of 2011 was 1.01 MGD. The daily facility pumpage during 2011, based on the flow totalizer readings, is summarized in Figure 1 on the following page.

Figure 1. 2011 Pumpage Summary



As shown in Figure 1, during the first three quarters of 2011, daily facility pumpage was often lower and/or intermittent. The key reasons for this are summarized below:

- During January and February, the facility was operated manually one to two shifts per day, depending on availability of personnel, because the new control system and backup control system were not yet operational. Moreover, Recovery Well RW-3 was off-line until February 17th due to pump failure and the time required to order, ship and install the new pump, as well as weather-related access delays. During this period, the facility pumpage ranged from approximately 0.3 MGD to 0.7 MGD depending on the number of shifts operated
- During the spring and summer months, the facility was shut-down in the afternoons (at the end of the day shift) on days when evening and/or overnight thunderstorms were forecast as a precaution against further lightning strike damage to the unprotected older control system components located throughout Bethpage State Park, which is an area prone to frequent lightning strikes. The facility is no longer staffed overnight, so it could not be restarted until the following morning. On these days, the facility pumpage ranged from approximately 0.4 to 0.6 MGD.

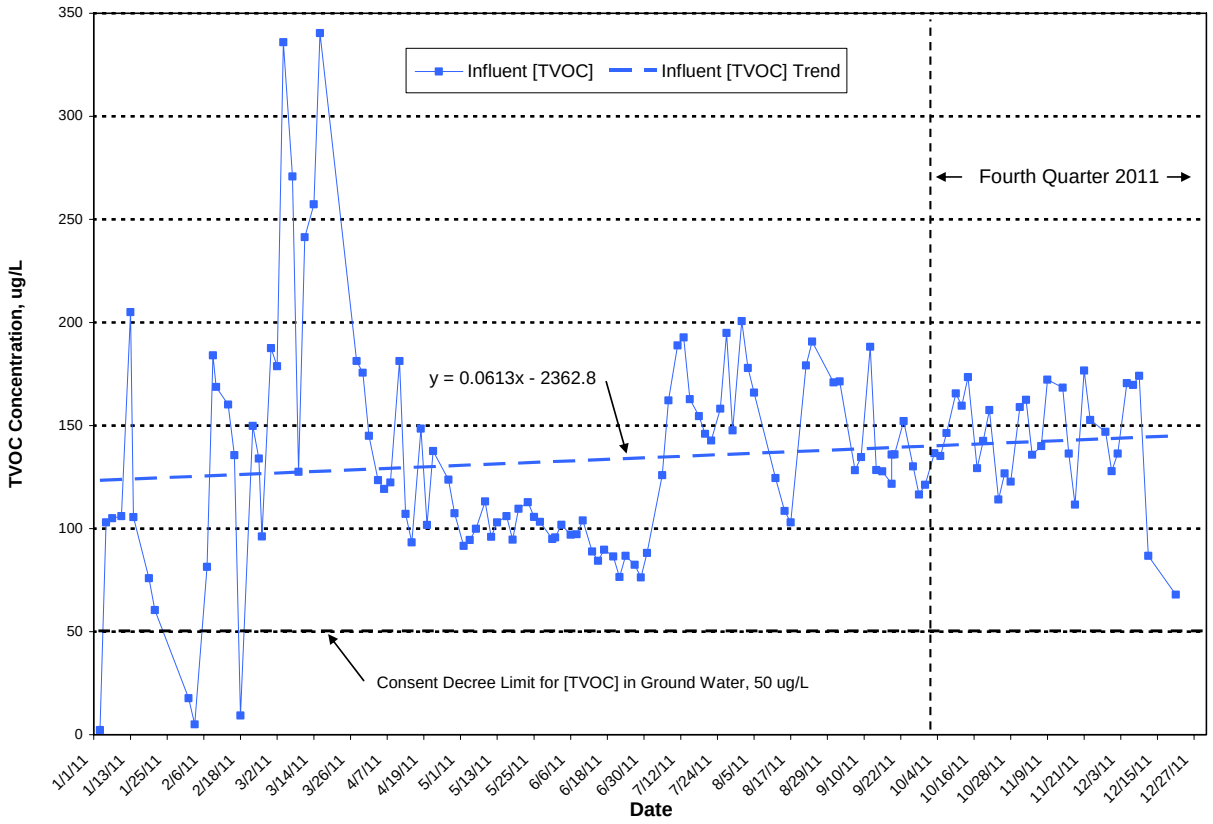
- Recovery Well RW-5 was off-line from July 14th – August 23rd due to pump failure and the time required to order, ship and install the new pump. During this period, the facility's flow fate was typically approximately 1.2 MGD. A new pump was installed in Recovery Well RW-5 on August 24th.
- The facility was off-line from August 25th – 29th as a precaution against damage during the passing of Hurricane Irene, and as a result of the post-storm power failure.
- The facility was off-line from September 19th – 21st for a truck-mounted acid-rinse of the air-stripper internals.

2.2 Ground Water-Treatment Facility Monitoring

In accordance with the O&M Manual (Operation and Maintenance Manual) for the facility, samples of the facility influent and effluent were collected approximately three times per week (except when the facility was off-line) and analyzed for VOCs (Volatile Organic Compounds) at the on-site laboratory. The facility influent and effluent were also tested weekly on-site for pH, iron, manganese, dissolved oxygen, ammonia and chloride. Monthly samples of influent and effluent were also sent to an outside laboratory for VOC (influent and effluent) and inorganic/leachate parameter (effluent only) analyses, per SPDES-equivalency requirements.

The influent [TVOC] (Total VOC Concentration(s)) results for 2011 are plotted in Figure 2 below:

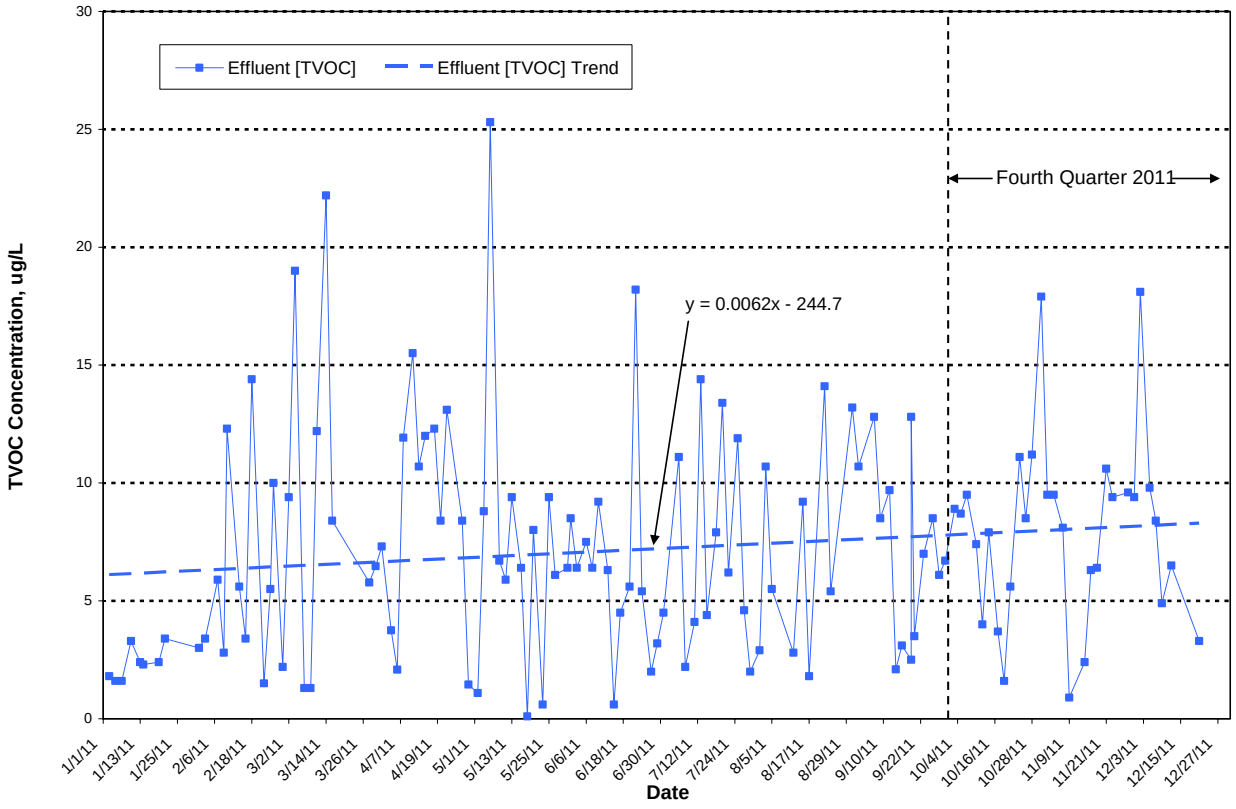
Figure 2. 2011 Facility Influent [TVOC] and Trend



As shown in Figure 2, during the fourth quarter of 2011, influent [TVOC] remained relatively consistent except for a noticeable decrease at the end of the quarter, and ranged from approximately 125 to 175 ug/L (micrograms per Liter). Influent [TVOC] showed a similar pattern during the third quarter but exhibited more variability, presumably due to the somewhat intermittent operation of the facility. Influent [TVOC] during the first half of the year reflects the operation of the facility. Specifically, the high degree of variability early in the year is attributed to the intermittent manual operation of the facility during January and February. The temporary spike in influent [TVOC] in March is attributed to the facility's return to basically full-time operation. Influent [TVOC] was generally higher than the 50-ug/L Consent Decree limit for ground water. The slope of the trend line in Figure 2 indicates that the influent [TVOC] exhibited a slightly increasing trend during 2011; however, this trend may be an artifact of the operational issues early in the year.

The effluent [TVOC] results for 2011 are plotted in Figure 3 below:

Figure 3. 2011 Facility Effluent [TVOC] and Trend

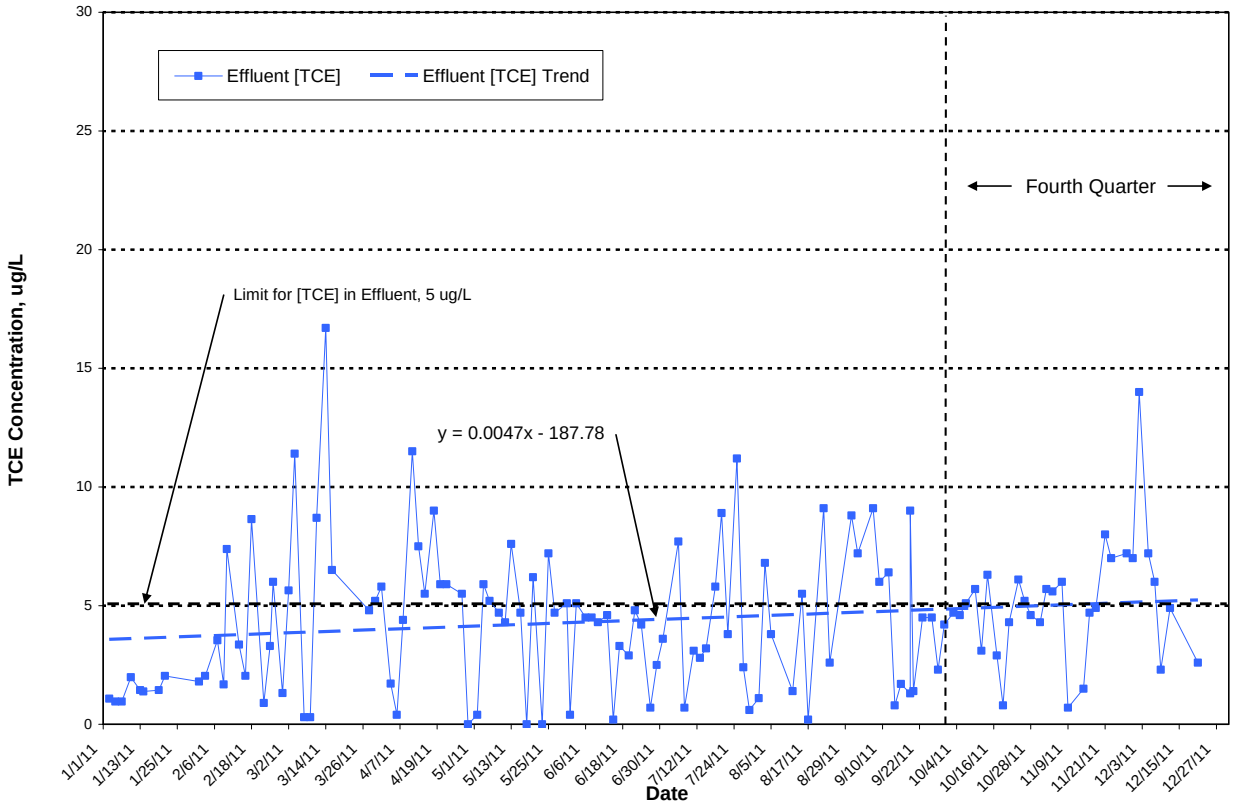


As shown in Figure 3, during the fourth quarter effluent [TVOC] exhibited variability, but was generally lower and less variable than during the middle part of the year. This is attributed to improved removal efficiency following the truck-mounted acid-rinse of the air-stripper performed in late September. The basically flat slope of the trend line in Figure 2 indicates that effluent [TVOC] was relatively consistent during 2011, despite the operational variability. The Consent

Decree limit for [TVOC] in the facility discharge is 100-ug/L. The effluent [TVOC] was much lower than this limit. This limit is not shown in Figure 3 to allow better resolution of the y-axis.

The concentrations of individual VOCs in the facility effluent were lower than their discharge limit except for [TCE] (trichloroethene concentration(s)). Effluent [TCE] often exceeded the 5-ug/L limit, especially prior to the truck-mounted acid-rinse. The effluent [TCE] results for 2011 are plotted in Figure 4 below, at the same vertical scale utilized for effluent [TVOC] in Figure 3.

Figure 4. 2011 Facility Effluent [TCE] and Trend



As shown in Figure 4, during the fourth quarter effluent [TCE] was generally lower and less variable than during the preceding quarters. This is also attributed to improved removal efficiency following the truck-mounted acid-rinse. The average effluent [TCE] during the fourth quarter was 5.1 ug/L. The average for the preceding three quarters was 4.3 ug/L, but may be biased low due to the operational issues early in the year. The basically flat slope of the trend line in Figure 4 indicates that, overall, effluent [TCE] was relatively consistent during 2011.

The effluent inorganic/leachate indicator parameter self-monitoring results for the fourth quarter are summarized in Table 1, which follows this page. As shown in Table 1, except for occasional slight exceedances for manganese, the concentrations of these parameters in the effluent were less than their discharge limits. The average concentration of manganese in the effluent this quarter was equal to the discharge limit. The concentrations of each parameter remained

TABLE 1
FOURTH QUARTER 2011
EFFLUENT INORGANIC PARAMETER SELF-MONITORING RESULTS

Parameter	Limit	Avg. Conc.	10/5/2011	10/12/2011	10/19/2011	10/26/2011	11/2/2011	11/9/2011	11/16/2011	11/23/2011	11/30/2011	12/7/2011	12/14/2011	12/21/2011	12/28/2011
pH	6.5 - 8.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.1	7.0	7.1	7.0
Iron	0.6	0.07	0.12	0.22	0.01	0.18	0.11	0.03	0.05	0.02	0.02	0.03	0.06	0.05	0.01
Manganese	0.6	0.6	0.6	0.5	0.5	**0.7**	0.6	**0.9**	**0.8**	**0.7**	0.6	0.4	0.6	0.5	**0.9**
Iron and Manganese	1.0	0.71	0.72	0.72	0.51	0.88	0.71	0.93	0.85	0.72	0.62	0.43	0.66	0.55	0.91
Dissolved Oxygen	No Std.	13.3	14	12.6	11.8	12.9	14.9	12.8	14.2	12.4	13.4	14.9	13.1	13.5	12.7
Ammonia	No Std.	5.53	5.20	5.52	5.52	5.04	5.12	5.36	5.76	5.20	5.52	6.08	5.60	6.08	5.84
Chloride	500	128	117	109	108	116	117	125	124	127	125	148	136	171	136

Notes: Limits are ground water discharge limits in NYSDEC TOGS 1.1.1.
Bold results exceed limits.

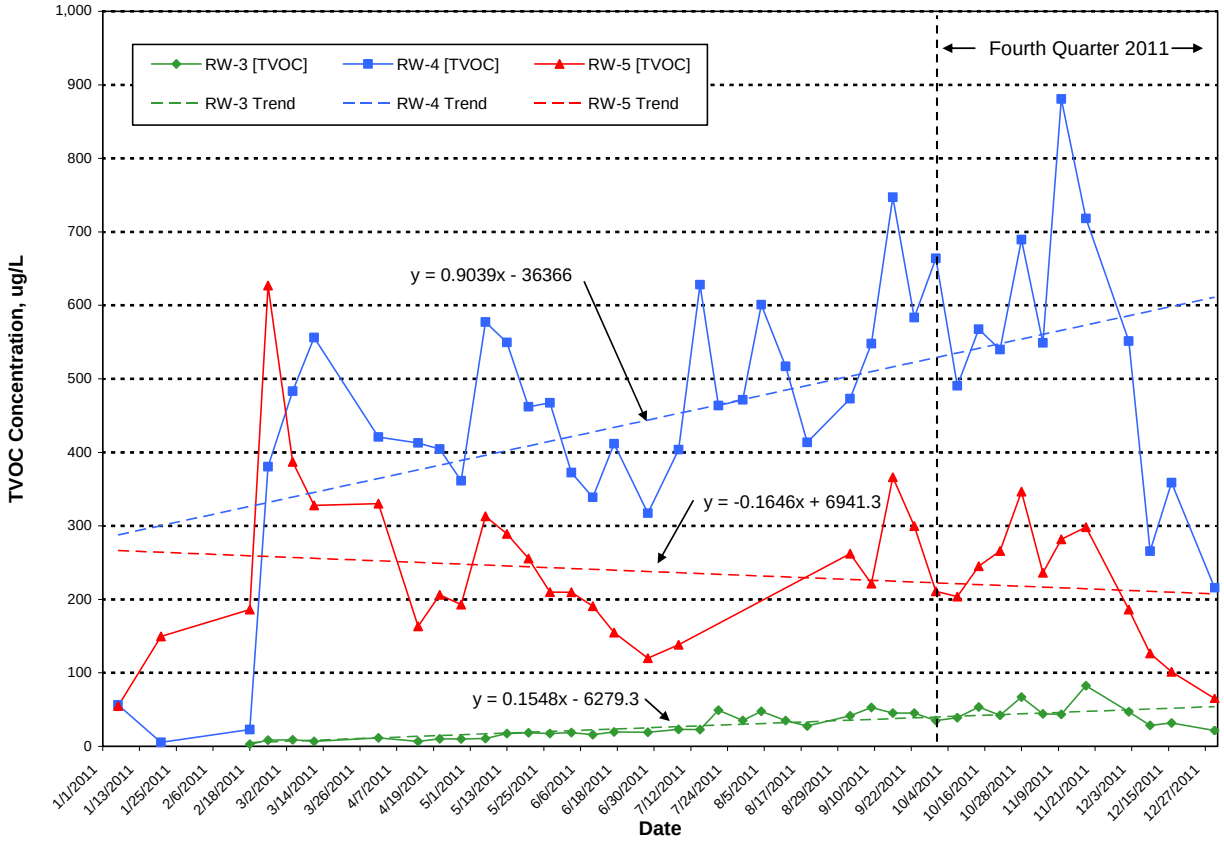
relatively consistent during the quarter. These findings are consistent with the previous three quarters' monitoring results.

Also in accordance with the O&M Plan for the facility, samples from each of the five recovery wells (Recovery Wells RW-1 through RW-5) were collected on an approximately weekly basis (except when the well or facility was off-line) and analyzed for VOCs at the on-site laboratory. The results of this monitoring are summarized below. [TVOC] in Recovery Wells RW-1 and RW-2 continued to be low and stable this quarter, specifically:

- [TVOC] in Recovery Well RW-1 ranged from 0.0 to 2.5 ug/L, and averaged 1.1 ug/L
- [TVOC] in Recovery Well RW-2 ranged from 0.0 to 8.0 ug/L, and averaged 2.0 ug/L
- [TVOC] in both recovery wells continued to exhibit flat trends this quarter
- Individual VOC concentrations in both recovery wells continued to be lower than their Class GA ground water-quality standard or guidance value

These results are consistent with the previous three quarter's results for these wells. Therefore, plots of their [TVOC] are not provided in this RAP Report. In contrast, [TVOC] in Recovery Wells RW-3, RW-4 and RW-5 continued to be much higher and more variable. The 2011 [TVOC] results and trends for these three recovery wells are plotted in Figure 5 below.

Figure 5. 2011 [TVOC] and Trends in RW-3, RW-4 and RW-5

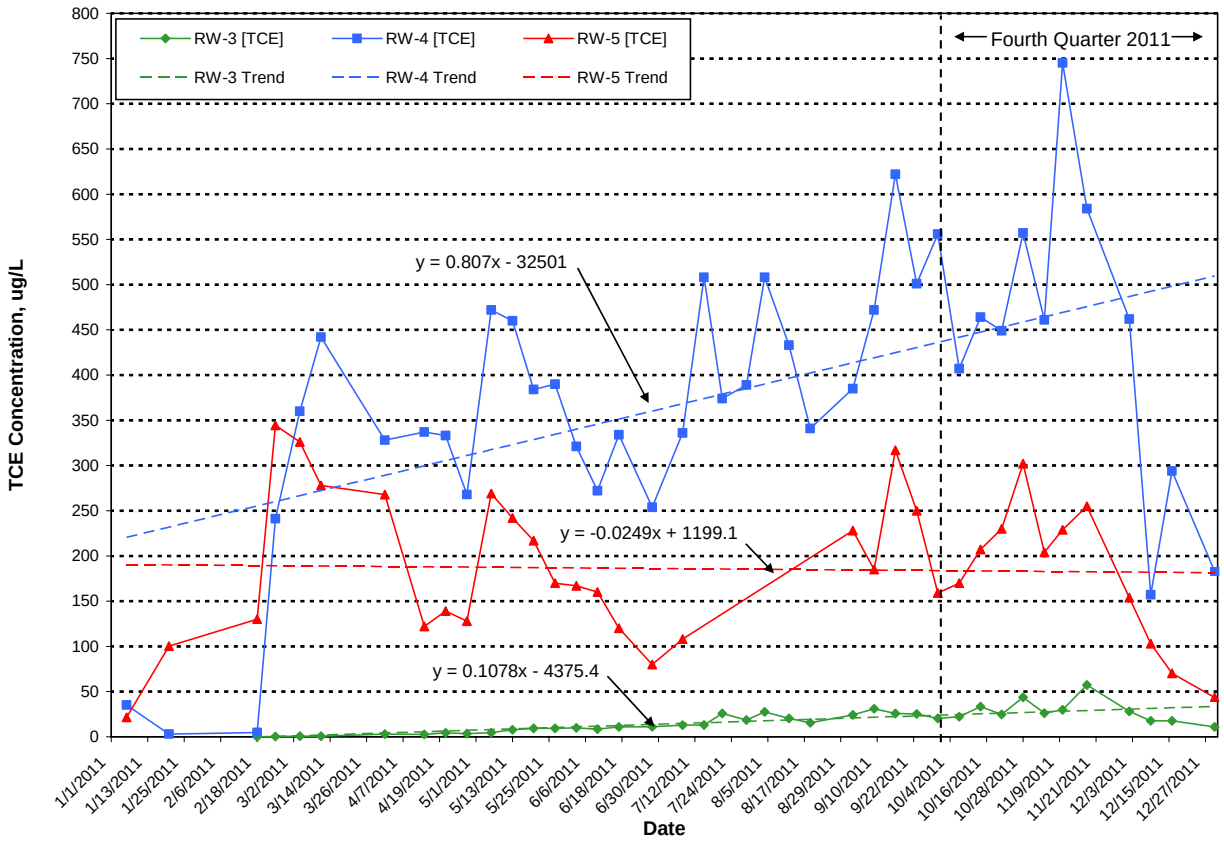


As shown in Figure 5, during the fourth quarter, [TVOC] was highest in Recovery Well RW-4, followed by Recovery Wells RW-5 and RW-3, respectively. [TVOC] in Recovery Wells RW-3 and RW-4 exhibited increasing trends during October and November, whereas [TVOC] in Recovery Well RW-5 remained relatively consistent during this two-month period. [TVOC] in all three recovery wells exhibited decreasing trends during December.

Based on the slopes of the trend lines in Figure 5, [TVOC] in Recovery Wells RW-3 and RW-4 exhibited increasing trends during 2011, whereas [TVOC] in Recovery Well RW-5 exhibited a decreasing trend. The decreasing trend in Recovery Well RW-5 may reflect this well's location at the end of the wellfield, and the facility's operation during 2011.

This quarter, the concentrations of three VOCs: TCE, PCE (tetrachloroethene) and cis-1,2-DCE (cis-1,2-dichloroethene) continued to exceed their 5-ug/L Class GA water-quality standard in Recovery Wells RW-3, RW-4 and RW-5. Also, in Recovery Well RW-5, the concentrations of 1,1-DCE (1,1-dichloroethene) and 1,1,1-TCA (1,1,1-trichloroethene) continued to exceed their 5-ug/L Class GA water-quality standard. The 2011 results for these VOCs in these recovery wells are plotted in Figures 6 through 9, respectively, and discussed, below:

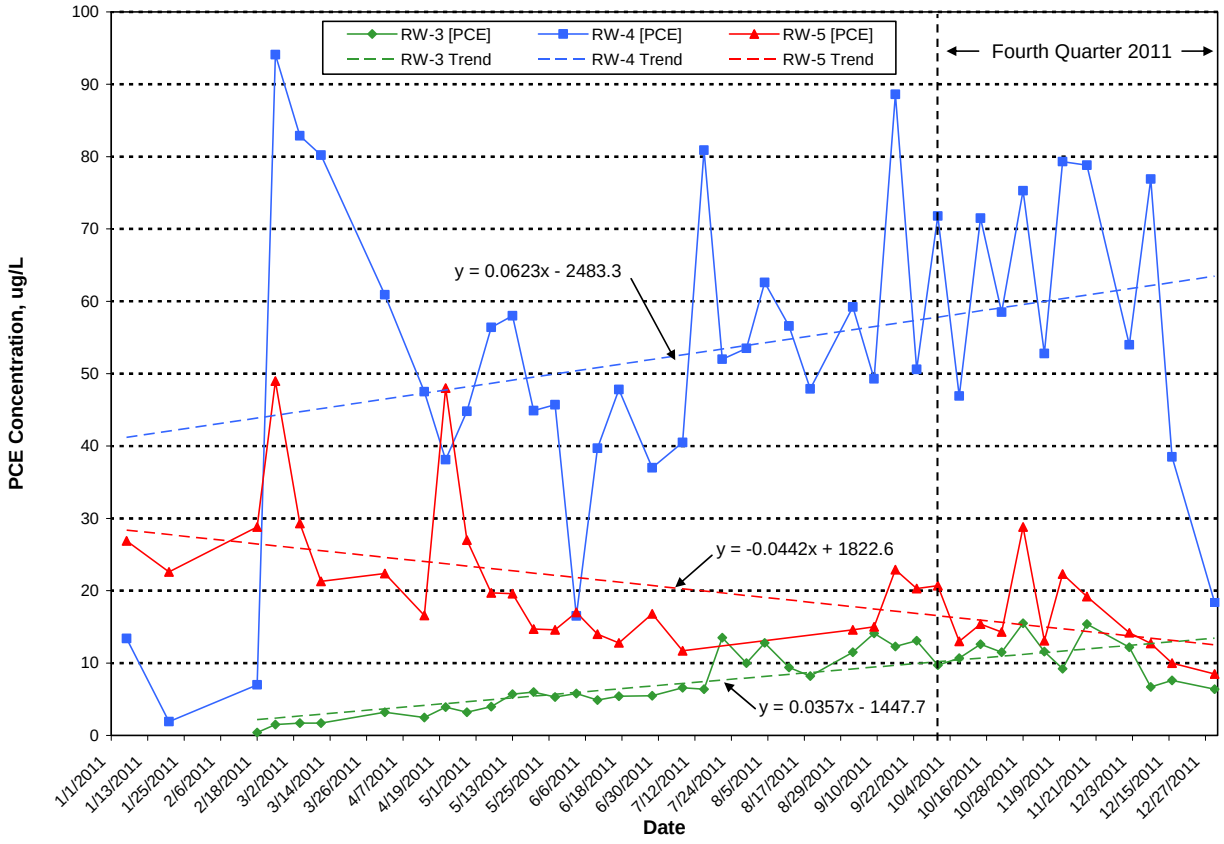
Figure 6. 2011 [TCE] and Trends in RW-3, RW-4 and RW-5



Overall, the [TCE] results shown in Figure 6 are similar to the [TVOC] results shown in Figure 5, reflecting the fact that TCE accounts for majority of the [TVOC] in these three recovery wells, particularly Recovery Wells RW-4 and RW-5. [TCE] was also highest in Recovery Well RW-4, followed by Recovery Wells RW-5 and RW-3, respectively. Moreover, during the fourth quarter of 2011, [TCE} in all three recovery wells also exhibited increasing trends during October and November, followed by decreasing trends during December.

Based on the slopes of the trend lines in Figure 6, [TCE] exhibited increasing trends in Recovery Wells RW-3 and RW-4, and a slight decreasing trend in Recovery Well RW-5. As noted above for [TVOC], the decreasing trend for [TCE] in Recovery Well RW-5 may reflect this well's position at the end of the wellfield, and the operation of the facility during 2011.

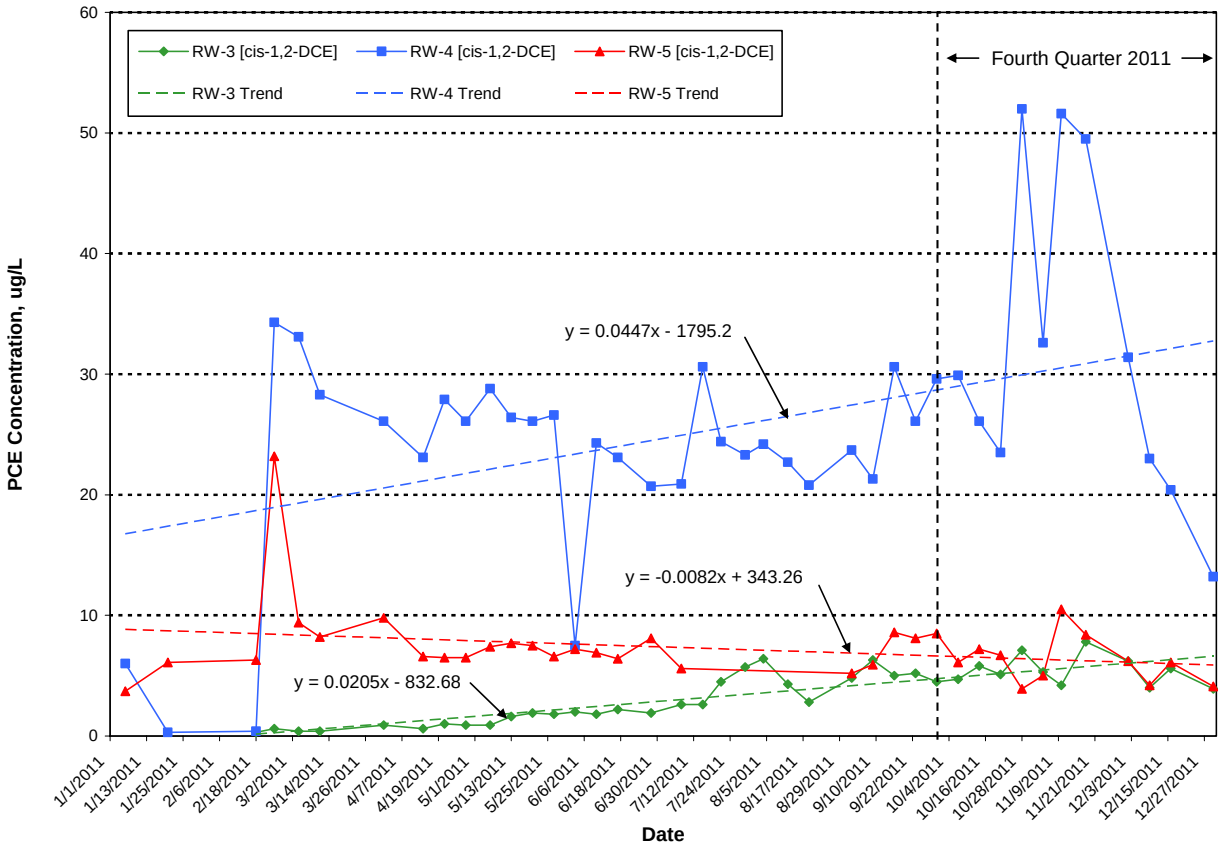
Figure 7. 2011 [PCE] and Trends in RW-3, RW-4 and RW-5



As shown in Figure 7 above, during the fourth quarter of 2011, [PCE] in all three recovery wells was relatively consistent during October and November, and began to decrease in December. [PCE] was highest in Recovery Well RW-4, and much lower in Recovery Wells RW-3 and RW-5. Based on the slopes of the trend lines in Figure 7, [PCE] exhibited increasing trends in Recovery Wells RW-3 and RW-4, and a decreasing trend in Recovery Well RW-5, during 2011.

Review of Figure 8 below indicates that during the fourth quarter of 2011, [cis-1,2-DCE] in Recovery Well RW-4 spiked during November, but then decreased during December. In contrast, the [cis-1,2-DCE] in Recovery Wells RW-3 and RW-5 were much lower, similar in magnitude, and remained relatively consistent.

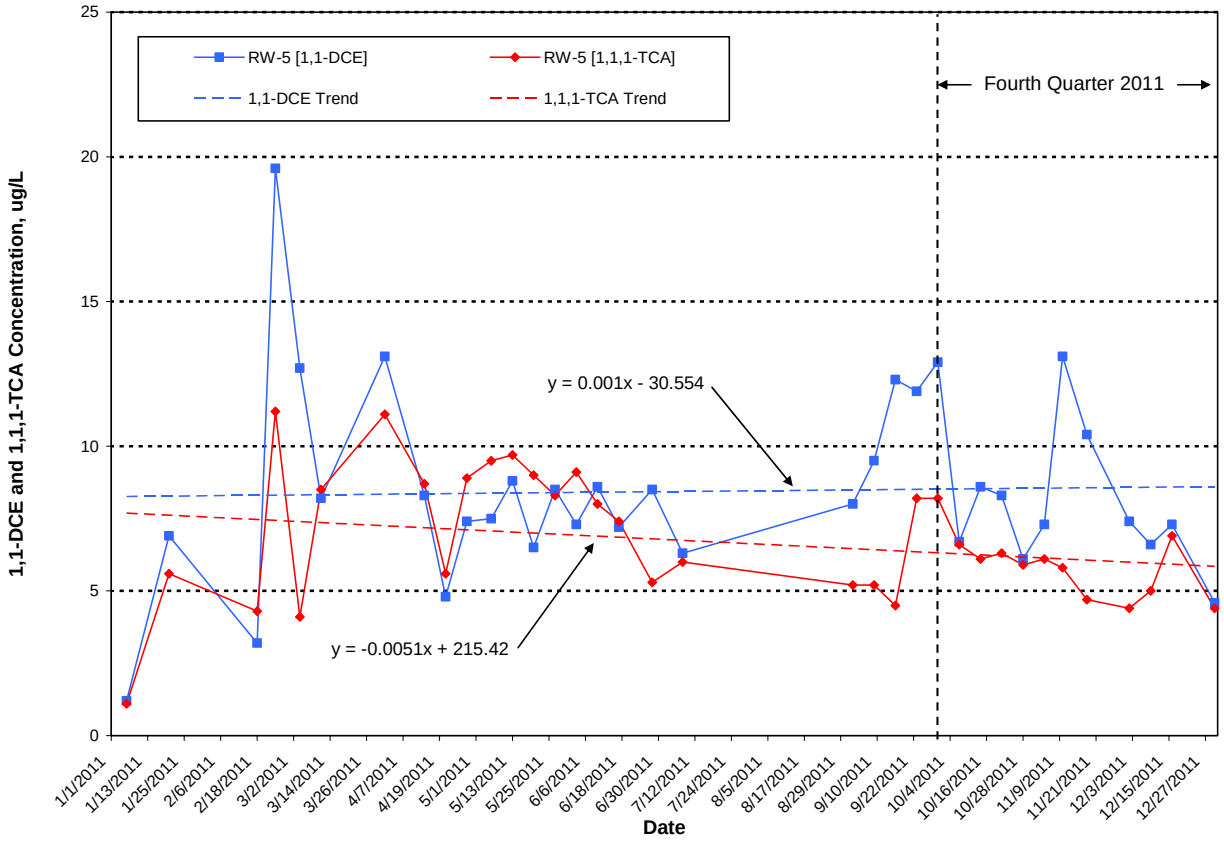
Figure 8. 2011 [cis-1,2-DCE] and Trends in RW-3, RW-4 and RW-5



Based on the slopes of the trend lines in Figure 8, [cis-1,2-DCE] in Recovery Wells RW-3 and RW-4 exhibited increasing trends during 2011, whereas the [cis-1,2-DCE] in Recovery Well RW-5 exhibited a slight decreasing trend. The increasing trend in Recovery Well RW-4 appears to be artificial, reflecting the low values early in the year and the spike in [cis-1,2-DCE] during November.

Figure 9 on the following page depicts [1,1-DCE], [1,1,1-TCA] and trends in Recovery Well RW-5 during 2011. Review of Figure 9 indicates that during the fourth quarter, the concentrations of these two VOCs exhibited fluctuating but decreasing trends, but were generally higher than their 5-ug/L water-quality standard. Based on the essentially flat slopes of the trend lines in Figure 9, the concentrations of these two VOCs in Recovery Well RW-5 were relatively consistent during 2011.

Figure 9. 2011 [1,1-DCE], [1,1,1-TCA] and Trends in RW-5



To assess emissions from the air stripper stack, the average stack emission concentration of each VOC detected on a regular basis in the facility influent was calculated utilizing the data from the on-site laboratory and the pumpage data maintained by the Town. In Table 2, which follows this page, the results are compared to the stack emissions limits in Appendix A, Table 1 of the Consent Decree. As shown in Table 2, except for TCE, the average concentration of each VOC was lower than its stack discharge limit this quarter. This finding is consistent with the previous three quarters of 2011. Specifically, during the first quarter vinyl chloride emissions were slightly higher than the stack discharge limit, and during the third quarter TCE emissions were slightly higher than the stack discharge limit.

Previous dispersion modeling of similar TCE concentrations has indicated that concentrations at the downwind property line are lower than applicable air quality guidelines, which is consistent with the results of the ambient air monitoring performed this quarter, which did not detect elevated levels of TCE in ambient air (see Section 3.1 below).

TABLE 2
FOURTH QUARTER 2011
COMPARISON OF AVERAGE STACK CONCENTRATIONS
TO STACK DISCHARGE REQUIREMENTS

Parameter	Average Stack Concentration* (ug/m^3)	Stack Discharge Requirements** (ug/m^3)
Benzene	ND	100
Bromodichloromethane	ND	0.03
Bromoform	ND	16.7
Carbon Tetrachloride	ND	100
Chlorobenzene	ND	1,170
Chloroethane	ND	52,000
Chloroform	ND	167
Dibromochloromethane	ND	0.03
1,2-Dichlorobenzene (o)	ND	1,000
1,3-Dichlorobenzene (m)	ND	0.03
1,4-Dichlorobenzene (p)	ND	1,500
1,1-Dichloroethane	ND	2,700
1,2-Dichloroethane	ND	20
1,1-Dichloroethene	37.4	66.7
1,2-Dichloroethene	109	2,630***
1,2-Dichloropropane	ND	1,170
Ethylbenzene	ND	1,450
Methylene Chloride	ND	1,170
Tetrachloroethene	196	1,120
Toluene	ND	7,500
1,1,1-Trichloroethane	21.1	38,000
Trichloroethene	1,527	900
Vinyl Chloride	ND	0.4
Xylenes (Total)	ND	1,450

FOOTNOTES:

* mass-balance calculation, based on average influent/effluent concentrations and flow rates.

** per Table 1 of Consent Decree.

*** total for cis- and trans- isomers.

ND = not detectable.

NA = not analyzed for this quarter, but historically not detected in influent.

ug/m^3 = micrograms per cubic meter.

Shaded values are higher than their respective stack discharge limit.

2.3 Ground Water-Quality Monitoring

The fourth quarter monitoring round was performed on November 9-11, 2011, and entailed collecting samples from each of the 16 wells required to be monitored. The samples were analyzed for VOCs and the required Part 360 leachate indicator and inorganic parameters. In addition, split-samples from selected Claremont Site monitoring wells, collected on October 31, 2011 by the Department's contractor and provided to the Town, were analyzed for VOCs.

The fourth quarter VOC results for the Town's monitoring wells are summarized below:

Well Number	[TVOC]	[Total VHO]*	[Total Aromatics]	[PCE] / [TCE]
Limits:	50	N/A	N/A	5 / 5
LF-1	1.1	ND	1.1	ND / ND
M-30B-R	ND	ND	ND	ND / ND
MW-5B	ND	ND	ND	ND / ND
MW-6A	ND	ND	ND	ND / ND
MW-6B	7.7	ND	7.7	ND / ND
MW-6C	9.0	ND	9.0	ND / ND
MW-6E	2.2	0.8	ND	ND / 1.4
MW-6F	ND	ND	ND	ND / ND
MW-7B-R	**2,022**	262	14.1	**76.4** / **1,670**
MW-8A	5.0	ND	ND	5.0 / ND
MW-8B	ND	ND	ND	ND / ND
MW-9B	15.4	2.8	12.0	ND / 0.6
MW-9C	ND	ND	ND	ND /ND
MW-11A	8.9	4.4	2.2	1.0 / 1.3
MW-11B	ND	ND	ND	ND / ND
OBS-1	7.2	1.7	4.0	0.5 / 1.0

Notes: Results are in micrograms per Liter (ug/L); bold font indicates exceedance of Limit.
VHO = Volatile Halogenated Organics.
*Excluding PCE and TCE.
[PCE] / [TCE] = Tetrachloroethene concentration / Trichloroethene concentration.
N/A = Not Applicable, these standards are compound-specific.
ND = Not Detected.

Review of the above table indicates that [TVOC] are currently at non-detectable or very low levels (i.e., < 5 ug/L) in 9 of the 16 Town monitoring wells, and that [TVOC] in six of the seven other Town monitoring wells are lower than the 50-ug/L Consent Decree limit for ground water. [TVOC] in Monitoring Well MW-7B-R is approximately two to three orders of magnitude higher, and is primarily due to TCE. In contrast, [TVOC] in Wells MW-6B and MW-6C are primarily due to aromatic hydrocarbons, and [TVOC] in Well MW-8A is primarily due to PCE. [TVOC] in Well MW-9B is due to a variety of VOCs.

Moreover, in addition to the above-noted (see bold-font) exceedances for TVOC, PCE and TCE in Well MW-7B-R, exceedances of the Class GA standards for individual VOCs occurred for 1,1-DCE, cis-1,2-DCE and 1,1,1-TCA in Well MW-7B-R this quarter.

The VOC results for the split-samples from the Claremont Site wells are summarized below:

Well Number	[TVOC]	[Total VHO]*	[Total Aromatics]	[PCE] / [TCE]
Limits:	50	N/A	N/A	5 / 5
EW-1A	19.3	3.7	ND	**12.8** / 2.8
EW-1B	17.3	2.8	12.3	1.0 / 1.2
EW-1C	ND	ND	ND	ND / ND
EW-2A	1.3	0.5	ND	ND / 0.8
EW-2B	ND	ND	ND	ND / ND
EW-2C	1.4	ND	ND	ND / 1.4
EW-3A	0.8	0.8	ND	ND / ND
EW-3B	ND	ND	ND	ND / ND
EW-3C	3.4	ND	2.0	ND / 1.4
MW-10B	1.9	0.3	ND	0.8 / 0.8
MW-10C	6.9	ND	ND	2.5 / 4.4
MW-10D	30.8	7.2	ND	**6.7** / **16.9**

Notes: Results are in micrograms per Liter (ug/L) , bold font indicates exceedance of Limit.
VHO = Volatile Halogenated Organics.
*Excluding PCE and TCE.
[PCE] / [TCE] = Tetrachloroethene concentration / Trichloroethene concentration.
N/A = Not Applicable, these standards are compound-specific.
ND = Not Detected.

Review of the above table indicates that [TVOC] in eight of these 12 wells are also currently at non-detectable or very low levels (i.e., < 5 ug/L), and that [TVOC] in the four other wells are lower than the 50-ug/L Consent Decree limit for ground water. Therefore, overall, the results for the Claremont Site wells are consistent with the results for the Town's monitoring wells. Exceedances of the Class GA limits for PCE and/or TCE occurred in Wells EW-1A and MW-10D. Split-samples for County Well Cluster BP-3 were not provided to the Town this quarter.

Additional observations regarding the fourth quarter split-sample results are summarized below:

- At Well Cluster EW-1, VOCs are primarily limited to PCE in the water-table zone of the aquifer, which is consistent with this well cluster's proximity to the former source area at the Claremont Site.
- At Well Clusters EW-2 and EW-3, VOCs are at non-detectable or very low levels, which is consistent with these well clusters being located further away from the former source area at the Claremont Site.
- At Well Cluster MW-10 (a Town well cluster that is not required to be monitored by the Town under the Consent Decree), the highest total VOC concentration occurs in the deepest well (MW-10D). Therefore, it appears that the vertical extent of VOCs at this location has not been fully delineated. Moreover, based on available information the VOCs at this location are not Landfill-related.

Overall, the fourth quarter split-sample VOC results are similar to the preceding three quarters' results for these wells. In addition, previous results for County Well Cluster BP-3 indicated that the highest [TVOC] was also detected in the deepest well sampled at this location. Therefore, the vertical extent of VOCs at this location has also not been fully delineated.

Review of the leachate indicator and inorganic parameter results for this quarter indicates that most of these parameters were not detected, or only detected sporadically at low concentrations below their respective Class GA standard or guidance value. The highest concentration(s) of each detected parameter, as well as the majority of the exceedances, occurred in wells located directly downgradient of the Landfill and within the capture zone of the Town's recovery wellfield (e.g., Well MW-6C). The specific exceedances that occurred this quarter are listed below:

- Well LF-1 – Ammonia
- Well M-30B-R – Sodium
- Well MW-5B – Manganese and sodium
- Well MW-6B – Ammonia, iron and sodium
- Well MW-6C – Ammonia, chloride, iron, phenols, sodium and total dissolved solids (TDS)
- Well MW-6E – Ammonia, iron and sodium
- Well MW-6F – Chloride, sodium and TDS
- Well MW-8B – Manganese (slight) and sodium
- Well MW-9B – Manganese (slight) and sodium
- Well MW-9C – Ammonia (slight) and sodium
- Well OBS-1 – Ammonia, manganese and sodium

No exceedances of the Class GA inorganic/leachate indicator parameter standards occurred in Wells MW-6A, MW-7B-R, MW-8A, MW-11A or MW-11B this quarter. Wells MW-6A and MW-8A are screened in the water-table zone of the aquifer, downgradient of the Landfill and upgradient of the Town's recovery wellfield. Wells MW-7B-R and MW-11B are screened in the deep potentiometric zone of the aquifer, downgradient of the Town's recovery wellfield. Well MW-11A is screened just above the deep potentiometric zone of the aquifer. The fact that elevated levels of inorganic/leachate parameters are not detected in these three downgradient wells indicates that the inorganic portion of the Landfill plume is also being captured by the Town's recovery wellfield.

The 15 figures in Appendix A depict 1) the ground water-flow patterns and TVOC plume boundaries within each of the three aquifer zones based on the fourth quarter 2011 monitoring results, 2) the approximate extent and distribution of the three VOC groups based on the first quarter and fourth quarter monitoring results, and 3) 2011 trends for the key VOCs detected. Review of the first three figures, which are from the ground water-monitoring consultant's fourth quarter report, indicates the following key findings:

1. Ground water-flow directions in the water-table zone of the aquifer continue to be from northwest to southeast, consistent with the regional ground water-flow direction reported by the U.S. Geological Survey in Scientific Investigations Map 3066 (Water-Table and Potentiometric-Surface Altitudes of the Upper Glacial, Magothy, and Lloyd Aquifers beneath Long Island, New York, March-April 2006, Water-Table – SHEET 1 of 4).
2. Ground water-flow directions in the shallow and deep potentiometric zones of the aquifer also continue to be generally from northwest to southeast, except in the vicinity of the capture zone of the Town's recovery wellfield, where radial flow occurs. As noted previously, the recovery wells were fully operational during the fourth quarter. Therefore, the water-level contours in these figures reflect the full extent of the capture zone that is typically present.

3. In the water-table zone of the aquifer, the areal extent of VOC detections in ground water is limited to the area immediately downgradient of the Claremont Site (Wells MW-8A, EW-1A and EW-2A).
4. In the shallow and deep potentiometric zones of the aquifer, VOC detections are more widespread and occur in the area downgradient of the Landfill and the Claremont Site that are within the capture zone of the Town's recovery wellfield. As noted in previous RAP Reports, based on available data, a portion of the VOC plume from the Claremont Site is too far to the north and east to be captured by the Town's recovery wellfield. The NYSDEC has also previously indicated that there appears to be at least one other upgradient source of VOCs besides the Claremont Site. Moreover, it should be noted that although the figures in Appendix A show the VOC plume boundary extending downgradient to Well Cluster MW-11, [TVOC] in these wells are in fact very low (8.9 ug/L and not detected in Wells MW-11A and MW-11B, respectively) and are not attributed to the Landfill.

Overall, the ground water-monitoring results for this quarter are consistent with the monitoring results for the first three quarters of 2011, and indicate that ground-water quality related to the Landfill is continuing to improve in response to the ongoing remediation. Review of the other 12 figures in Appendix A, which are from the ground water-monitoring consultant's annual summary report, and the text of that report, indicates the following additional findings:

- Water-level elevations in the various monitoring wells decreased by an average of 0.73 feet between the first and fourth quarter monitoring rounds. This pattern is attributed to natural variations in recharge to the aquifer from precipitation, as well as restored operation of the Town's recovery wellfield during the second half of the year.
- Vertical hydraulic gradients tended to be downward, which is the natural gradient pattern, at monitoring well clusters located outside the influence of the Town's, the County's, or the Claremont Site's recovery well fields (e.g., Well Cluster MW-10). Vertical hydraulic gradients tend to be upward at well clusters located within the area of influence of one of these well fields (e.g., Well Cluster MW-6). The depth(s) of the upward gradient(s) depends on the screen interval(s) of the recovery wellfield.
- The fourth through sixth figures in Appendix A show the first quarter total volatile halogenated organics (VHOs), total aromatic hydrocarbons and PCE results, respectively, overlain with the fourth quarter results. As shown in these figures, the approximate extents and distributions of total VHOs and PCE are similar for the first and fourth quarters of 2011. In contrast, the extent and distribution of aromatic hydrocarbons are greater during the first quarter.
- VHO concentrations were non-detectable or very low in the majority of the monitoring wells sampled during 2011. The highest concentrations of VHOs, primarily consisting of TCE, were detected in Well MW-7B-R, and several VHOs in this well typically exceeded their ground water-quality standard. VHOs had the greatest areal extent and highest concentrations of the three parameter groups. In the monitoring wells in which VHOs were detected, concentrations were relatively stable except for Wells MW-9B, MW-11A and MW-7B-R, which exhibited increasing trends during 2011.
- Aromatic hydrocarbon concentrations were also non-detectable or very low in the majority of the monitoring wells sampled during 2011. The highest concentrations were detected in Wells MW-6B and MW-6C, and several compounds in one or both of these wells typically exceeded their ground water-quality standard. Aromatic hydrocarbons had the smallest areal extent and lowest concentrations of the three parameter groups. In the monitoring

wells in which aromatic hydrocarbons were detected, concentrations were also relatively stable except for Well OBS-1, which exhibited fluctuation, and Well MW-9B, which exhibited an increasing trend.

- [PCE] were also non-detectable or very low in the majority of the monitoring wells sampled during 2011. The highest concentrations of PCE were detected in Wells MW-7B-R and MW-8A. In the monitoring wells in which PCE was detected, concentrations were also relatively stable except for Well MW-7B-R, which exhibited an increasing trend, and Well MW-8A, which exhibited a slight decreasing trend.

3.0 RESULTS OF AMBIENT-AIR AND SOIL-GAS MONITORING

3.1 Ambient Air-Monitoring Results

The scope of this monitoring, which was developed based on the general requirements in the Consent Decree and accepted by the Department, entails sorbent-tube sampling for VOCs at one upwind and two downwind locations over a 24-hour period during a low/falling barometer, laboratory analysis of the samples, and comparison of the results to the NYSDEC DAR-1 short-term (8-hour) and long-term (annual) guideline concentrations (SGCs and AGCs, respectively). Sample locations are pre-selected based on National Weather Service forecast. Meteorological conditions were monitored during sampling for comparison to forecasted conditions.

The fourth quarter monitoring round was performed on December 13-14, 2011. The upwind sample was collected at the north end of the Landfill near the ground water-treatment facility building. The downwind samples were collected along the south boundary of the Landfill. The downwind samplers were downwind of the Landfill for the entire the test period. The barometer fell by 0.07 inches of mercury during the first part of the test, remained steady during the middle of the test, and rose slightly at the end of the test, for a total drop of 0.02 inches of mercury.

A number of VOCs were detected at similar, low concentrations in both the upwind and downwind samples. All VOC detections were much lower than the DAR-1 SGCs. The detections of six VOCs (benzaldehyde, benzene, carbon tetrachloride, chloroform, 1,2-dichloroethane and 2/4-ethyltoluene) were slightly higher than the DAR-1 AGCs. However, their concentrations in the upwind and downwind samplers were similar. TCE was only detected sporadically at low concentrations, in one upwind and one downwind sample. Based on these results, VOC detections in ambient air this quarter are attributed to background ambient air quality.

These findings are consistent with the monitoring results for the first three quarters of 2011. Copies of Figure 2.1 and Table 4.1 from the air-monitoring consultant's annual summary report, which depict the ambient-air monitoring locations and the quarterly results, respectively, are provided in Appendix B.

3.2 Soil-Gas Quality Monitoring Results

The scope of this monitoring entails sorbent-tube grab-sampling (approximately 10-minute sampling interval) for VOCs at 15 perimeter gas monitoring well locations, including multiple-depth sampling at one location (Well M9), and comparison of the results to the NYSDEC DAR-1 SGCs and AGCs (Note: This comparison is made for informational purposes only, there are no New York State standards for VOCs in soil gas.)

The fourth quarter monitoring round was performed on December 13, 2011. All wells were sampled except Well M21, which is no longer accessible due to construction of a concrete wall along this area of the site. A number of VOCs were detected at generally low concentrations, in a majority of the soil-gas samples. However, all VOC detections were much lower than the DAR-1 SGCs, and only a few were detected at concentrations higher than the DAR-1 AGCs. Most of these "exceedances" were sporadic and relatively low in magnitude. [PCE] increased with depth in Well M9. This trend is attributed to shallow ground-water contamination originating offsite. TCE was only detected in two soil-gas samples.

Based on the results, overall, VOC concentrations in soil gas are low and consistent with an old MSW landfill with a perimeter gas collection system, and are not a concern for construction-related excavation should it be required. Accordingly, the only recommendation is for the Town to assess the feasibility of restoring access to Well M21, or replacing/substituting this soil-gas monitoring well with another soil-gas monitoring well.

These findings are consistent with the results from the previous three quarterly monitoring rounds. Copies of Figure 2.3 and Table 4.2 from the air-monitoring consultant's annual summary report, which depict the soil-gas monitoring locations and the quarterly results, respectively, are provided in Appendix B.

3.3 Soil-Gas Pressure Monitoring Results

The scope of this monitoring entails field measurement of pressure in 12 gas monitoring wells at three locations around the Landfill utilizing an inclined manometer to verify zero or negative (vacuum) pressure readings in the vicinity of the perimeter landfill gas collection system. The fourth quarter monitoring round was performed on December 14, 2011. Zero to slightly negative pressure readings were measured in all 12 gas wells. Based on these results, the perimeter land gas collection system is functioning properly and is preventing off-site migration.

This determination is consistent with the results of three prior quarterly monitoring rounds performed in 2011; as well as the results of the 2011 annual zero percent gas migration survey, which did not detect off-site migration of landfill gas. Copies of Figure 2.3 and Table 5.1 from the air-monitoring consultant's annual summary report, which depict soil gas-pressure monitoring locations and the quarterly results, respectively, are provided in Appendix B.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this RAP Report, based on the above information, are:

1. The facility was operated and monitored as fully as possible during 2011 given the need to: 1) operate the facility part-time in manual mode early in the year until the new control system was installed and functional, 2) shut the facility down temporarily during the spring and summer when thunderstorms were forecast, replace the submersible pumps in Recovery Wells RW-3 and RW-5, and 4) perform a truck-mounted acid-rinse of the air-stripper.
2. The facility was fully operational during the fourth quarter and maintained an average pumpage rate of 1.35 MGD. The average pumpage rate for all of 2011 was 1.01 MGD.

3. The average [TVOC] of the facility influent continued to exceed the 50-ug/L limit for ground water listed in Appendix A, Table 2 of the Consent Decree; and the concentrations of individual VOCs in certain monitoring and recovery wells continued to exceed their respective Class GA standards. Therefore, continued operation of the facility is warranted. It is recognized, however, that the majority of the VOC loading to the facility is associated with the Claremont Site, and possibly other nearby sources of ground-water contamination that are not related to the Landfill.
4. The average [TVOC] of the facility effluent continues to be well below the 100-ug/L limit for discharge listed in Appendix A, Table 2 of the Consent Decree. However, the effluent [TCE] often exceeded the 5-ug/L limit for this VOC. Under normal operation, the air stripper should be capable of removing more of the TCE from the effluent. The lower than expected removal efficiency during 2011 is attributed to the need for another acid-wash of the air stripper.
5. Except for occasional slight exceedances for manganese, the concentrations of the inorganic parameters monitored in the effluent during 2011 were less than their discharge limits. The average concentration of manganese in the facility effluent was less than or equal to the 0.6-ug/L discharge limit.
6. Except for vinyl chloride during the first quarter, and TCE during the third and fourth quarters, individual VOC concentrations in the air stripper stack exhaust were much lower than the limits in Appendix A, Table 1 of the Consent Decree. Based on previous dispersion modeling of the stack discharge, the current emissions should not result in an exceedance of the NYSDEC DAR-1 guideline concentrations at the downwind property line. This determination is consistent with ambient air monitoring results, which did not detect elevated Landfill-related levels of vinyl chloride or TCE in ambient air during 2011.
7. Elevated VOC concentrations continued to be present in Recovery Wells RW-3, RW-4 and RW-5 during 2011. VOC concentrations in Recovery Wells RW-1 and RW-2 were lower than Consent Decree and Class GA standards. However, a portion of the ground water collected by each recovery well is from its downgradient side. Moreover, the third quarter results for Well MW-9D continue to indicate the presence of VOCs downgradient of the Landfill and upgradient of the recovery wellfield. Therefore, continued operation of Recovery Wells RW-1 and RW-2 is also warranted.
8. The VOC results for the Town monitoring well samples and Claremont Site split-samples indicate that ground-water quality at most locations is continuing to improve. However, the current results for Town Well Cluster MW-10 and previous results for County Well Cluster BP-3 indicate that the vertical extent of VOCs at these locations has not been fully delineated. These VOCs are not associated with the Landfill; therefore their delineation is not the responsibility of the Town under the Consent Decree.
9. Elevated concentrations of certain inorganic/leachate indicator parameters continued to be present to certain wells located downgradient of the Landfill and upgradient of the Town's recovery wellfield during 2011. Elevated concentrations of these parameters were not detected at Well Cluster MW-11, located downgradient of the Town's recovery wellfield.
10. The results of the ambient-air and soil-gas monitoring performed during 2011 continue to indicate that the Landfill is not a significant source of VOCs in ambient air or soil gas, and that the perimeter gas collection system is preventing off-site migration of landfill gas.

Accordingly, this RAP Report recommends the following for the upcoming calendar quarter:

1. Perform an additional truck-mounted acid-rinse of the facility air stripper internals, if necessary, to maintain/restore the treatment efficiency at/to required levels.
2. Repair/replace air-stripper acid-rinse and air flow-sensing equipment, and capabilities. (Note: The contract for this work was put out to public bid on August 27, 2012 by the Town.)
3. Restore access to Soil-Gas Monitoring Well M21, or replace/substitute it with another well, if feasible. (Note: This 30-inch-deep soil-gas monitoring well was replaced in-kind at an adjacent location on September 6, 2012 by LKB.)
4. Investigate feasibility of protecting/replacing the susceptible control system equipment in Bethpage Park from lightning strike damage as an alternative to shutting system down when thunderstorms are forecast.
5. Inventory the replacement parts and equipment onsite, and order items not onsite that have long lead times and are likely to be required for facility and/or recovery well repairs, so that systems can be returned to service as soon as possible following a malfunction.
6. Continue to analyze split-samples from selected Claremont Site monitoring wells for VOCs to provide current ground-water VOC data for these locations.
7. Continue to incorporate water-level data from selected County monitoring wells for the Fireman's Training Center to augment the Town's water-level data for the area.

Additionally, it is recommended that the NYSDEC delineate the vertical extent of VOCs at the locations of Well Clusters MW-10 and BP-3, and evaluate the results with respect to the existing recovery wellfields to determine if additional recovery wells are required to capture these VOCs.

APPENDIX A

Figures 1 through 3
from
“Quarterly Monitoring Report, Fourth Quarter 2011 Results, Old Bethpage Landfill, Old Bethpage, New York”

Gannett Fleming, August 2012

and

Figures 1 through 3 and Appendix B
from
“2011 Annual Monitoring Report, January Through December 2011, Old Bethpage Landfill, Old Bethpage, New York”

Gannett Fleming, August 2012

Gannett Fleming

FIGURE 1

N

LEGEND

- MW-5A (67.28) — OLD BETHPAGE LANDFILL MONITORING WELL LOCATION AND DESIGNATION WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- EW-3A — CLAREMONT POLYCHEMICAL SITE MONITORING WELL
- TW-2 — PHASE II EXTENSION WELL
- BP-1A — NASSAU COUNTY MONITORING WELL
- M-29B — UPGRADIENT WELL
- GROUNDWATER FLOW DIRECTION
- 64 — LINE OF EQUAL ELEVATION OF THE WATER TABLE IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- APPROXIMATE EXTENT OF THE VOC PLUME IN WATER TABLE WELLS - FOURTH QUARTER 2011
- RECHARGE BASIN
- (NM) — NOT MEASURED

MELVILLE ROAD
WINDING ROAD
BETHPAGE SPAGNOLI ROAD
ROUND SWAMP ROAD
LANDFILL
N.C. FIREMANS TRAINING CENTER

MW-10A (63.91)
EW-3A (62.76)
MW-7A (60.85)
N-9980 (57.05)
BP-3A (62.42)
EW-2A (64.05)
MW-8A (64.44)
MW-6A (63.94)
MW-9A (62.18)
EW-1A (66.43)
BP-4A (61.26)
MW-5A (64.52)
BP-1A (64.45)
BP-5A (61.89)
BP-8A (63.72)
TW-3-R (66.20)
MW-29AR (69.11)
MW-30A (69.45)
TW-2 (66.37)
MW-30B-R (69.04)
MW-29B (69.50)
TW-1 (68.51)
BP-6A (64.30)
BP-7A (66.69)

58 60 62 64 66 68

0 500 1500

SCALE: 1" = 600'

WATER TABLE FLOW MAP
FOURTH QUARTER 2011

OLD BETHPAGE LANDFILL

TOWN OF OYSTER BAY, NEW YORK

08/07/12 1:53pm FILE= K:\PROJECTS\53000\53085\002\2011\3rd QUARTER 2011\F-1 4th QTR 2011.dwg by Ikamornik XREFs=site base,

Gannett Fleming

FIGURE 2

N

MELVILLE ROAD

WINDING ROAD

BETHPAGE SPAGNOLI ROAD

ROUND SWAMP ROAD

LANDFILL

MW-10B (64.00)

EW-3C (62.63)

RW-4 (50.62)

RW-5 (55.82)

MW-11A (56.78)

RW-3 (52.86)

RW-2 (51.79)

EW-2C (64.88)

MW-9B (61.09)

MW-8B (64.19)

MW-6B (64.07)

EW-1C (65.71)

LF-2 (65.77)

LF-3 (68.87)

MW-5B (64.47)

RW-1 (67.39)

BP-11 (60.14)

BP-9I (59.60)

BP-4I (61.22)

BP-12A (59.26)

LF-1 (65.74)

BP-1B (64.40)

LF-4 (71.49)

N.C. FIREMANS TRAINING CENTER

54 56 58 60 62 64 66 68 70

0 500 1500

SCALE: 1" = 600'

LEGEND

MW-5B (64.30) ●	OLD BETHPAGE LANDFILL MONITORING WELL LOCATION AND DESIGNATION WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL
BP-4I ⊗	NASSAU COUNTY MONITORING WELL
EW-1C ⬡	CLAREMONT POLYCHEMICAL SITE MONITORING WELL
RW-2 ⊙	RECOVERY WELL
LF-2 ▧	PHASE III WELL
→	GROUNDWATER FLOW DIRECTION
64	LINE OF EQUAL ELEVATION OF THE WATER TABLE IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
	APPROXIMATE EXTENT OF THE VOC PLUME IN SHALLOW POTENTIOMETRIC ZONE WELLS - FOURTH QUARTER 2011
	RECHARGE BASIN
(NM)	NOT MEASURED

SHALLOW POTENTIOMETRIC FLOW MAP FOURTH QUARTER 2011

OLD BETHPAGE LANDFILL

TOWN OF OYSTER BAY, NEW YORK

07/23/11 1:54pm FILE= K:\PROJECTS\53000\53085\002\2011\4th QUARTER 2011\F-2 4TH QTR 2011.dwg by LKAMORNIK XREFs=site base,

Gannett Fleming

FIGURE 3

N

LEGEND

- MW-8C (65.49) — OLD BETHPAGE LANDFILL MONITORING WELL LOCATION AND DESIGNATION WATER LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- RW-2 — RECOVERY WELL
- BP-4I — NASSAU COUNTY MONITORING WELL
- OBS-1 — PHASE II EXTENSION WELL
- GROUNDWATER FLOW DIRECTION
- 64 — LINE OF EQUAL ELEVATION OF THE WATER TABLE IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)
- APPROXIMATE EXTENT OF THE VOC PLUME IN DEEP POTENTIOMETRIC ZONE WELLS - FOURTH QUARTER 2011
- RECHARGE BASIN

MELVILLE ROAD

BETHPAGE SPAGNOLI ROAD

WINDING ROAD

WINDING ROAD

LANDFILL

N.C. FIREMANS TRAINING CENTER

ROUND SWAMP ROAD

ROUND SWAMP ROAD

MW-10C (63.92)

MW-8C (65.15)

MW-6E (64.07)

MW-9C (60.25)

MW-7B-R (59.71)

RW-5 (55.82)

RW-4 (50.62)

RW-3 (52.86)

RW-2 (51.79)

RW-1 (67.39)

OBS-1 (60.49)

MW-11B (56.70)

BP-3B (59.64)

BP-15B (60.08)

BP-9B (59.57)

BP-14B (59.79)

BP-4B (61.21)

BP-12B (59.12)

BP-5B (61.70)

BP-6B (63.86)

BP-7B (66.64)

64 62 60 58 56 54 52 50 66

0 500 1500

SCALE: 1" = 600'

DEEP POTENTIOMETRIC FLOW MAP FOURTH QUARTER 2011

OLD BETHPAGE LANDFILL

TOWN OF OYSTER BAY, NEW YORK

08/07/12 1:15pm FILE= K:\PROJECTS\53000\53085\002\2011\4th QUARTER 2011\F-3 4TH QTR 2011.dwg by LKAMORNIK XREFs=site base,

Gannett Fleming

FIGURE 1

N

LEGEND

MW-11A (1.1) ●	OLD BETHPAGE LANDFILL MONITORING WELL LOCATION AND TOTAL VOLATILE HALOGENATED ORGANICS CONCENTRATION, PPB
EW-1C ⬡	CLAREMONT POLYCHEMICAL SITE MONITORING WELL
M-30B-R ⊞	UPGRADIENT WELL
RW-2 ⊙	RECOVERY WELL
LF-2 ▨	PHASE III WELL
OBS-1 ▲	PHASE II EXTENSION WELL
	FIRST QUARTER 2011 (APRIL) APPROXIMATE AREAL EXTENT OF THE VOLATILE HALOGENATED ORGANICS PLUME
	FOURTH QUARTER 2011 (NOVEMBER) APPROXIMATE AREAL EXTENT OF THE VOLATILE HALOGENATED ORGANICS PLUME
	OVERLAP OF APPROXIMATE AREAL EXTENT OF THE VOLATILE HALOGENATED ORGANICS FOR FIRST & FOURTH QUARTERS OF 2011
(NS)	NOT SAMPLED
(ND)	NOT DETECTED

NOTE:

1. PLUME CONTOUR IS BASED ON TOTAL VOLATILE HALOGENATED ORGANICS CONCENTRATIONS IN THE MONITORING AND RECOVERY WELLS. PLUME LIMITS BASED ON MOST RECENT AVAILABLE DATA AS NOTED.

EW-3A,B,C
APR(21.1) NOV(2.2)

MW-10A,B,C,D
APR(78.8) NOV(29.6)

RW-4
APR(420.8) NOV(804.1)

MW-7B-R
APR(335.9) NOV(1945.8)

RW-5
APR(327.0) NOV(259.4)

MW-11A,B
APR(4.1) NOV(7.9)

RW-3
APR(7.2) NOV(39.5)

EW-2A,B,C
APR(3.6) NOV(2.7)

MW-9B,C
APR(ND) NOV(4.6)

RW-2
APR(2.1) NOV(0.8)

MW-8A,B,C
APR(10.5) NOV(ND)

MW-6A,B,C,D,E,F
APR(5.6) NOV(2.2)

EW-1A,B,C
APR(19.5) NOV(12.5)

RW-1
APR(0.8) NOV(1.1)

OBS-1
APR(2.1) NOV(2.7)

MW-5B
APR(ND) NOV(ND)

LF-1
APR(ND) NOV(ND)

M-30B-R
APR(3.9) NOV(ND)

MELVILLE ROAD

BETHPAGE SPAGNOLI ROAD

WINDING ROAD

WINDING ROAD

LANDFILL

N.C. FIREMANS TRAINING CENTER

RECHARGE BASIN

RECHARGE BASIN

PHASE II PIT

ROUND SWAMP ROAD

ROUND SWAMP ROAD

0 500 1500

SCALE: 1" = 600'

APPROXIMATE EXTENT AND DISTRIBUTION OF TOTAL VOLATILE HALOGENATED ORGANICS ANNUAL 2011

OLD BETHPAGE LANDFILL

TOWN OF OYSTER BAY, NEW YORK

08/13/12 11:25am FILE= K:\PROJECTS\53000\53085\004\Annual 2011\F-1 Annual 2011.dwg by LKAMORNIK XREFs=site base,

Gannett Fleming

FIGURE 2

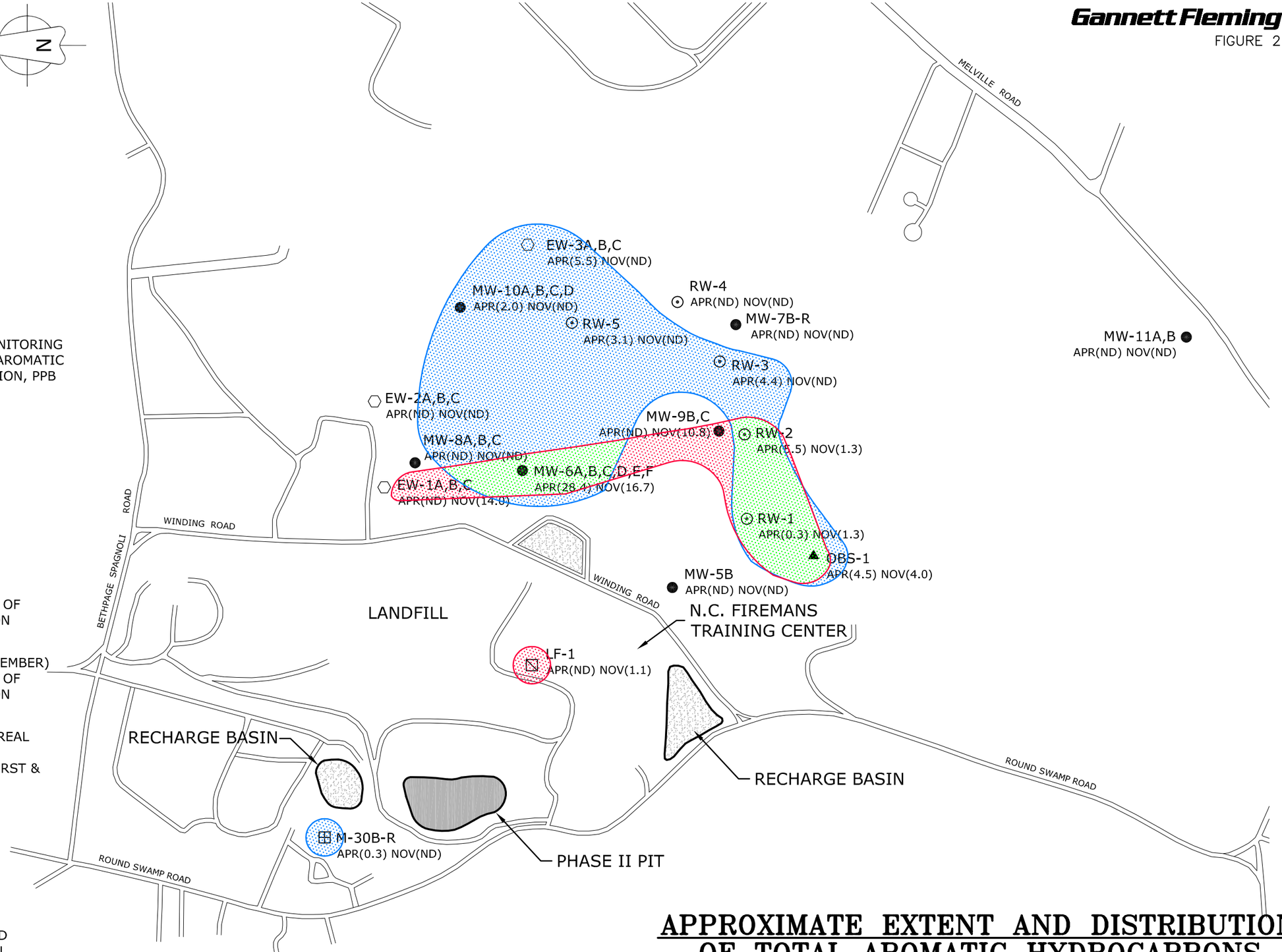
N

LEGEND

MW-7B (2.0) ●	OLD BETHPAGE LANDFILL MONITORING WELL LOCATION AND TOTAL AROMATIC HYDROCARBON CONCENTRATION, PPB
EW-1C ⬡	CLAREMONT POLYCHEMICAL SITE MONITORING WELL
M-30B-R ⊞	UPGRADIENT WELL
RW-2 ⊙	RECOVERY WELL
LF-2 ▨	PHASE III WELL
OBS-1 ▲	PHASE II EXTENSION WELL
	FIRST QUARTER 2011 (APRIL) APPROXIMATE AREAL EXTENT OF THE AROMATIC HYDROCARBON PLUME
	FOURTH QUARTER 2011 (NOVEMBER) APPROXIMATE AREAL EXTENT OF THE AROMATIC HYDROCARBON PLUME
	OVERLAP OF APPROXIMATE AREAL EXTENT OF THE AROMATIC HYDROCARBON PLUME FOR FIRST & FOURTH QUARTERS OF 2011
(NS)	NOT SAMPLED
(ND)	NOT DETECTED

NOTE:

1. PLUME CONTOUR IS BASED ON TOTAL AROMATIC HYDROCARBON CONCENTRATIONS IN THE MONITORING AND RECOVERY WELLS. PLUME LIMITS BASED ON MOST RECENT AVAILABLE DATA AS NOTED.



0 500 1500

SCALE: 1" = 600'

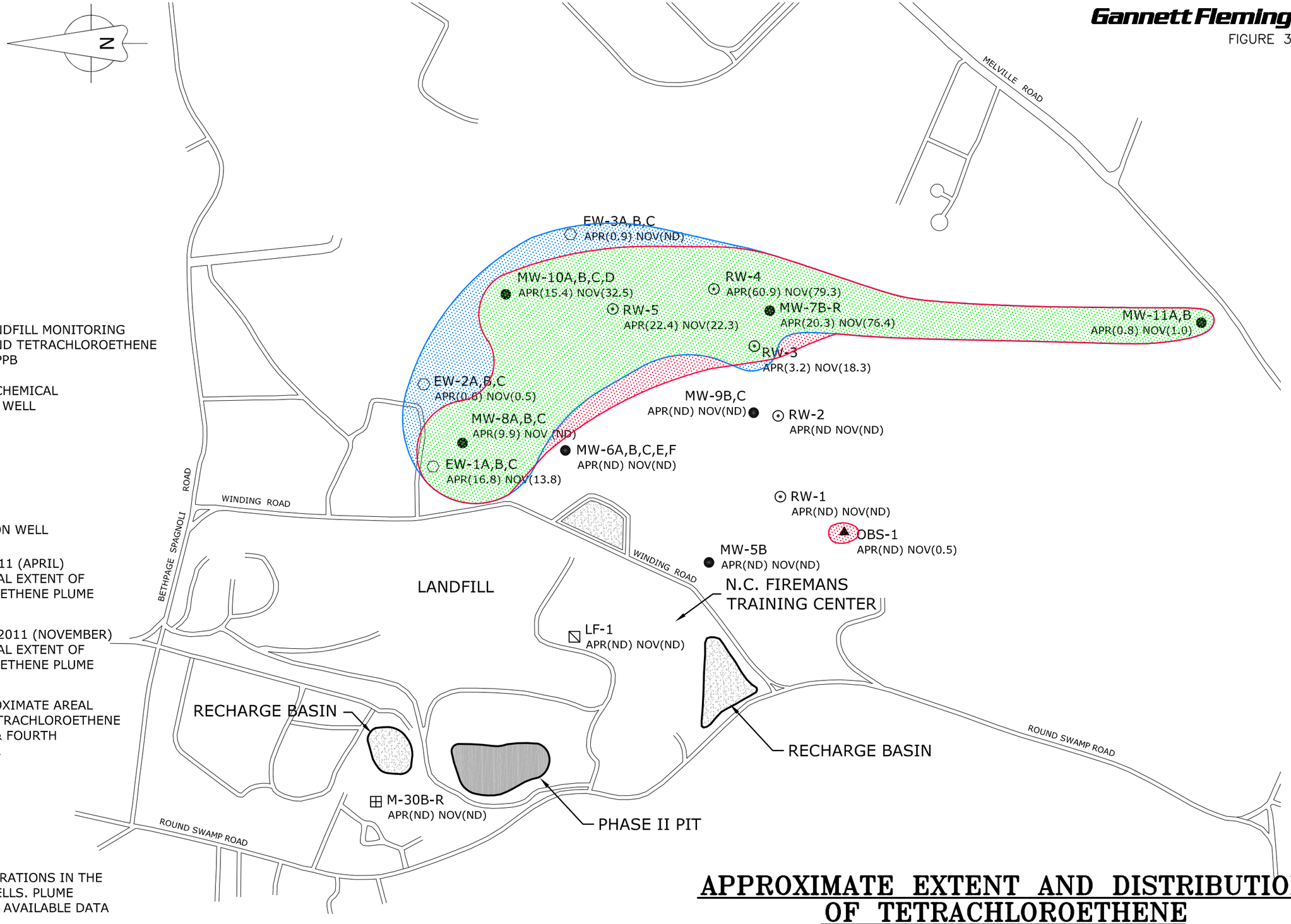
APPROXIMATE EXTENT AND DISTRIBUTION OF TOTAL AROMATIC HYDROCARBONS ANNUAL 2011

OLD BETHPAGE LANDFILL

TOWN OF OYSTER BAY, NEW YORK

Gannett Fleming

FIGURE 3



LEGEND

MW-5B (ND) ●	OLD BETHPAGE LANDFILL MONITORING WELL LOCATION AND TETRACHLOROETHENE CONCENTRATION, PPB
EW-1C ⬡	CLAREMONT POLYCHEMICAL SITE MONITORING WELL
M-30B-R ⊞	UPGRADIENT WELL
RW-2 ⊙	RECOVERY WELL
LF-2 ▨	PHASE III WELL
OBS-1 ▲	PHASE II EXTENSION WELL
	FIRST QUARTER 2011 (APRIL) APPROXIMATE AREAL EXTENT OF THE TETRACHLOROETHENE PLUME
	FOURTH QUARTER 2011 (NOVEMBER) APPROXIMATE AREAL EXTENT OF THE TETRACHLOROETHENE PLUME
	OVERLAP OF APPROXIMATE AREAL EXTENT OF THE TETRACHLOROETHENE PLUME FOR FIRST & FOURTH QUARTERS OF 2011
(NS)	NOT SAMPLED
(ND)	NOT DETECTED

NOTE:

1. PLUME CONTOUR IS BASED ON TETRACHLOROETHENE CONCENTRATIONS IN THE MONITORING AND RECOVERY WELLS. PLUME LIMITS BASED ON MOST RECENT AVAILABLE DATA AS NOTED.

APPROXIMATE EXTENT AND DISTRIBUTION OF TETRACHLOROETHENE ANNUAL 2011

OLD BETHPAGE LANDFILL

TOWN OF OYSTER BAY, NEW YORK

Figure 1. Total Volatile Halogenated Organics - Water Table

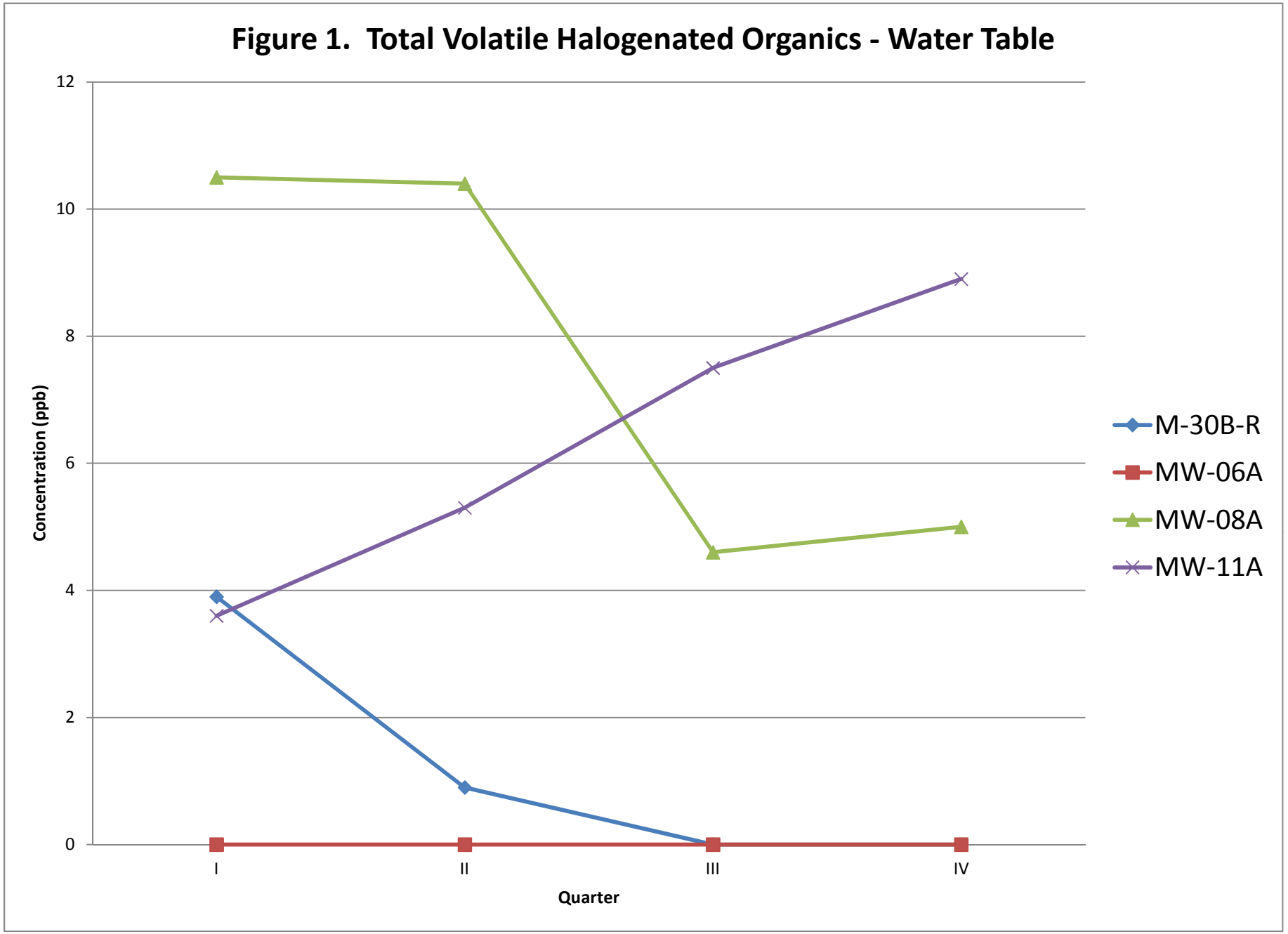


Figure 2. Total Volatile Halogenated Organics - Shallow Potentiometric Zone

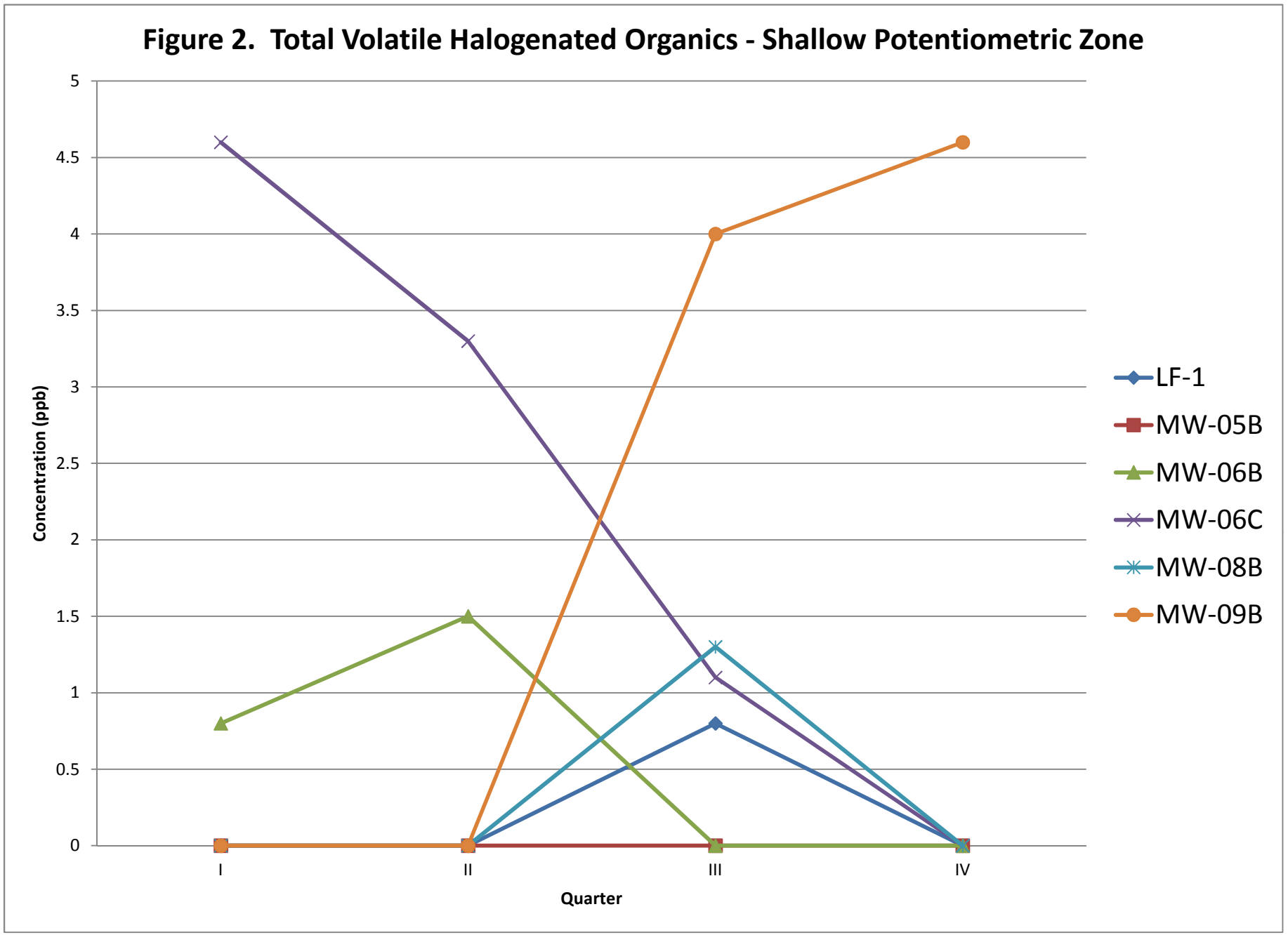


Figure 3. Total Volatile Halogenated Organics - Deep Potentiometric Zone

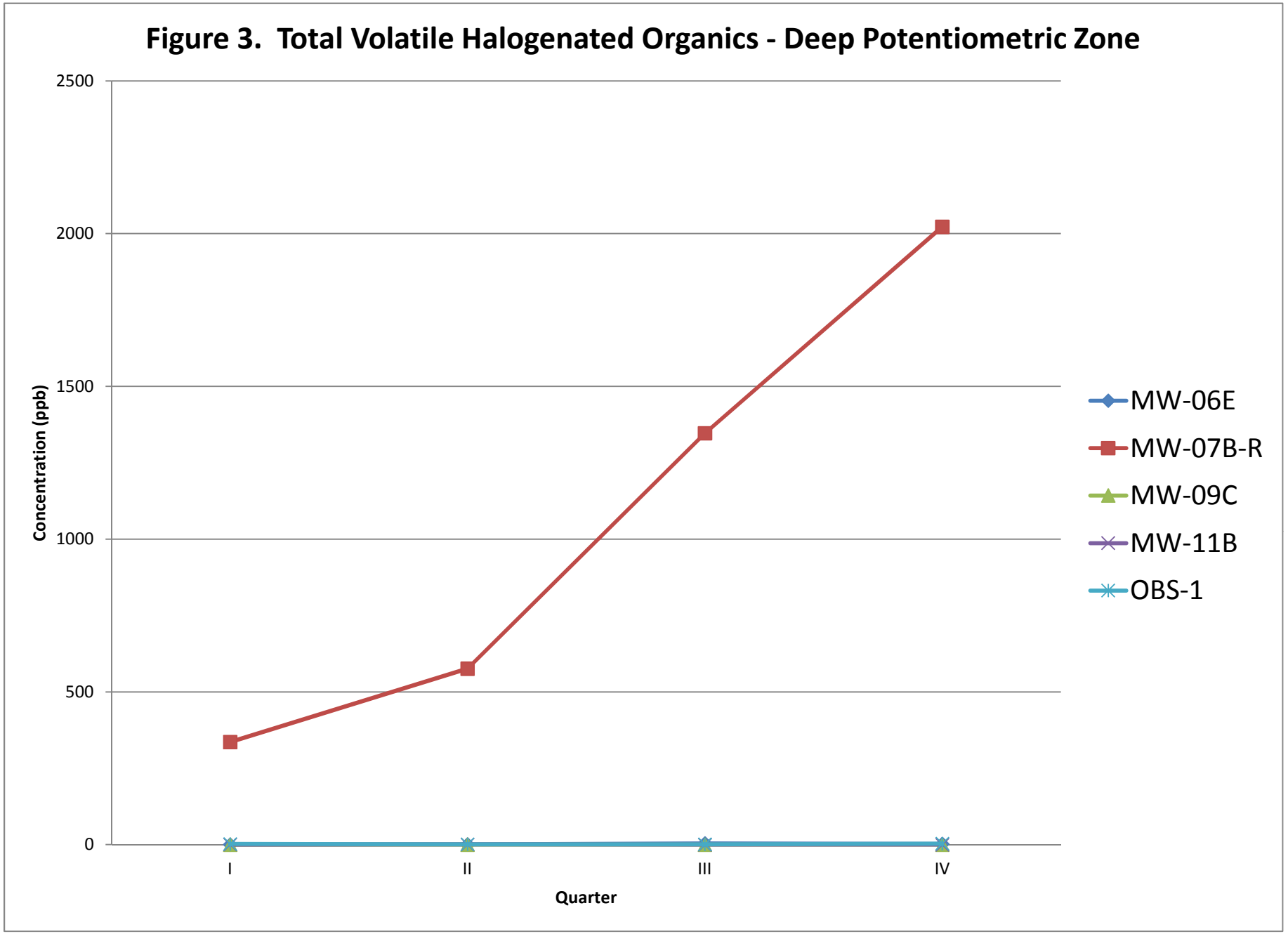


Figure 4. Total Aromatic Hydrocarbons - Water Table

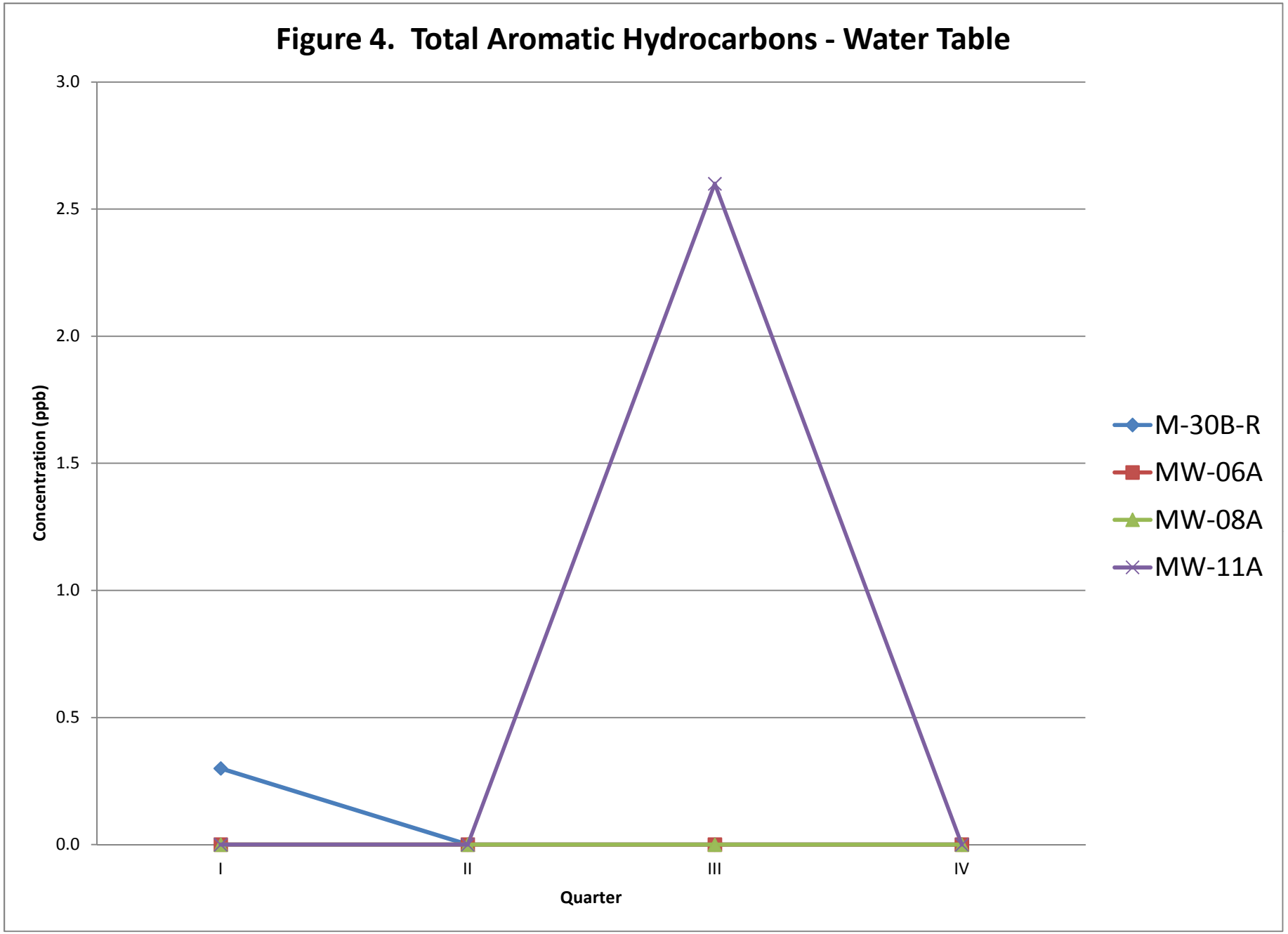


Figure 5. Total Aromatic Hydrocarbons - Shallow Potentiometric Zone

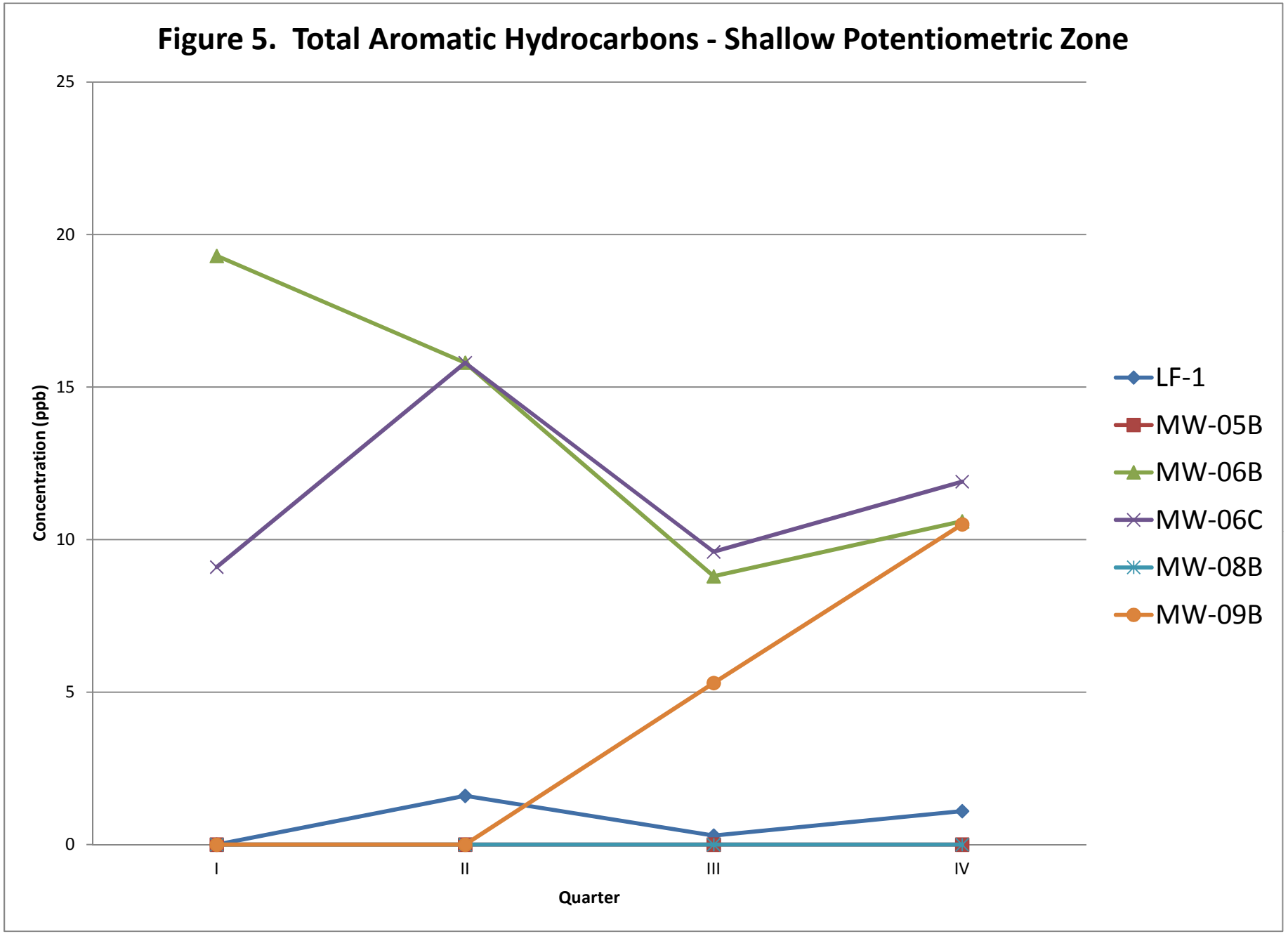


Figure 6. Total Aromatic Hydrocarbons - Deep Potentiometric Zone

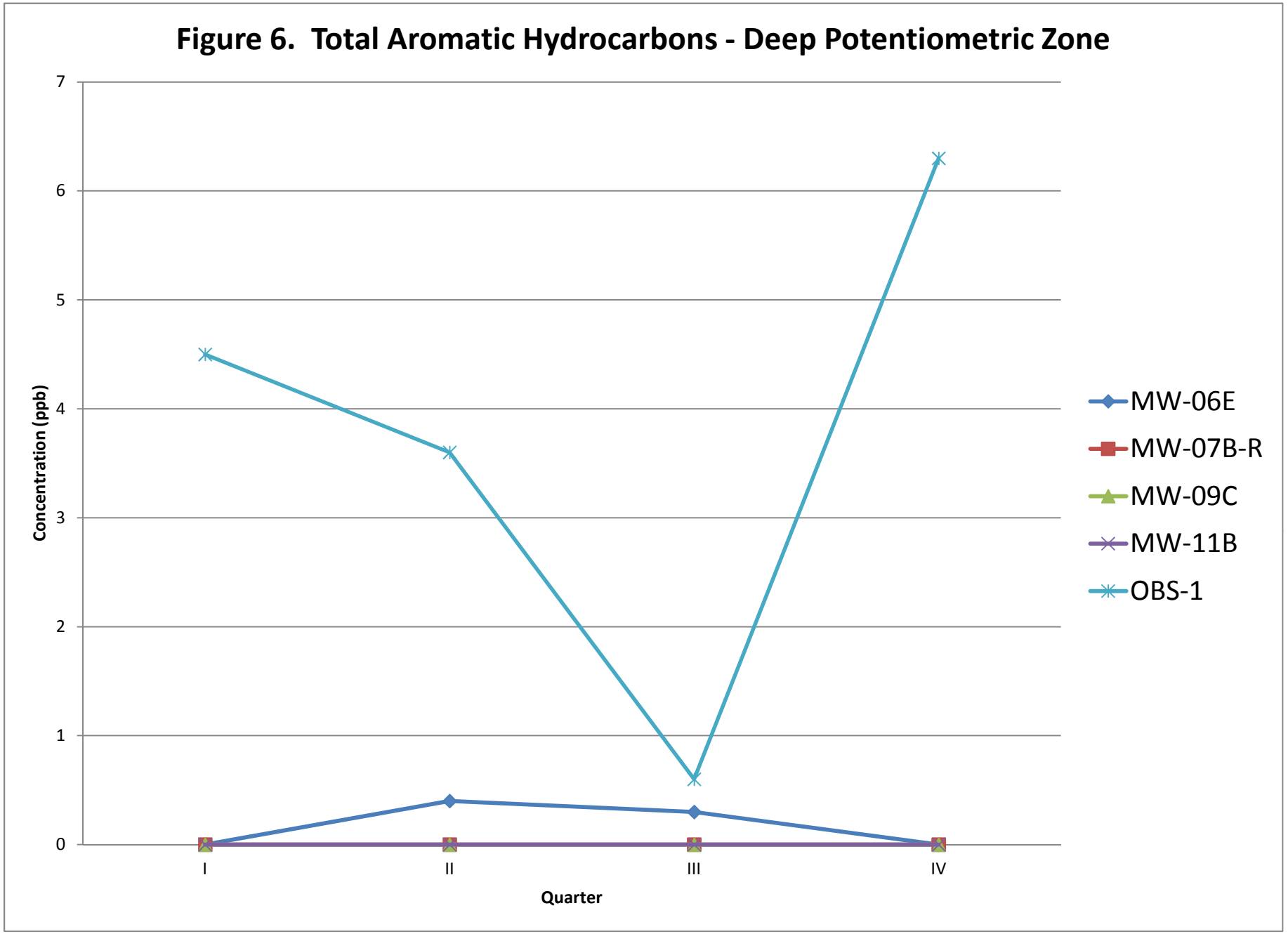


Figure 7. Tetrachloroethylene - Water Table

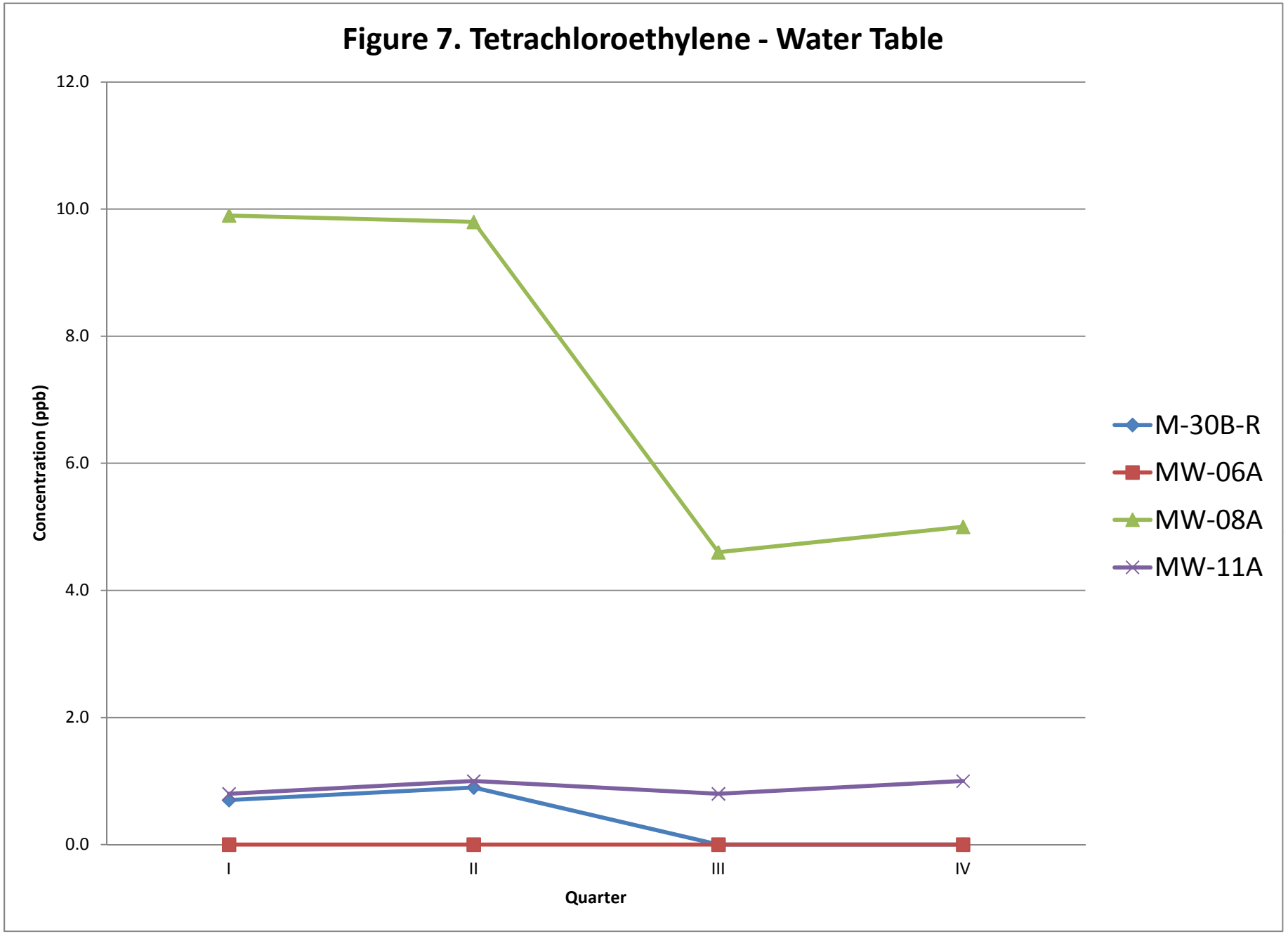


Figure 8. Tetrachloroethylene - Shallow Potentiometric Zone

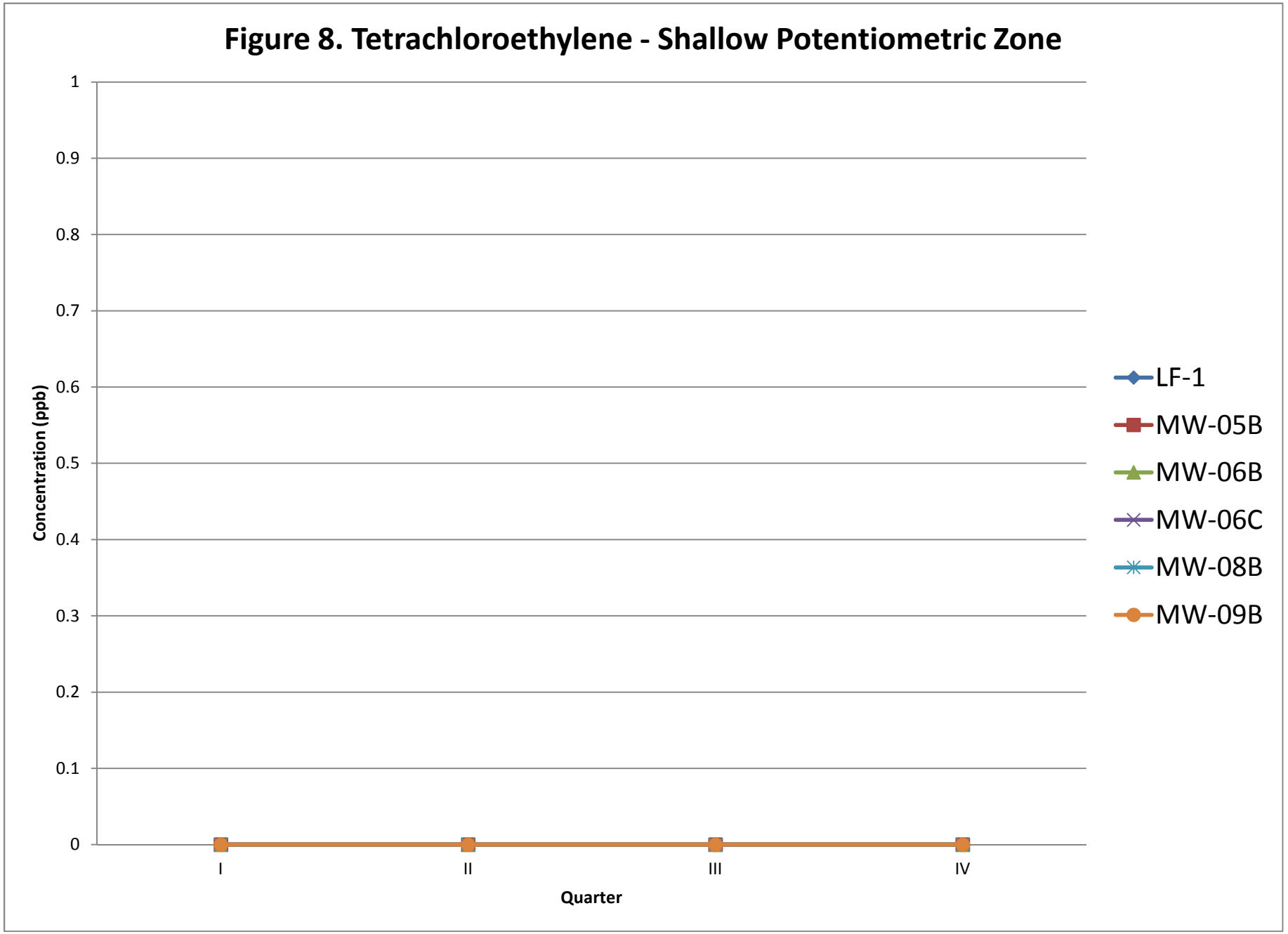
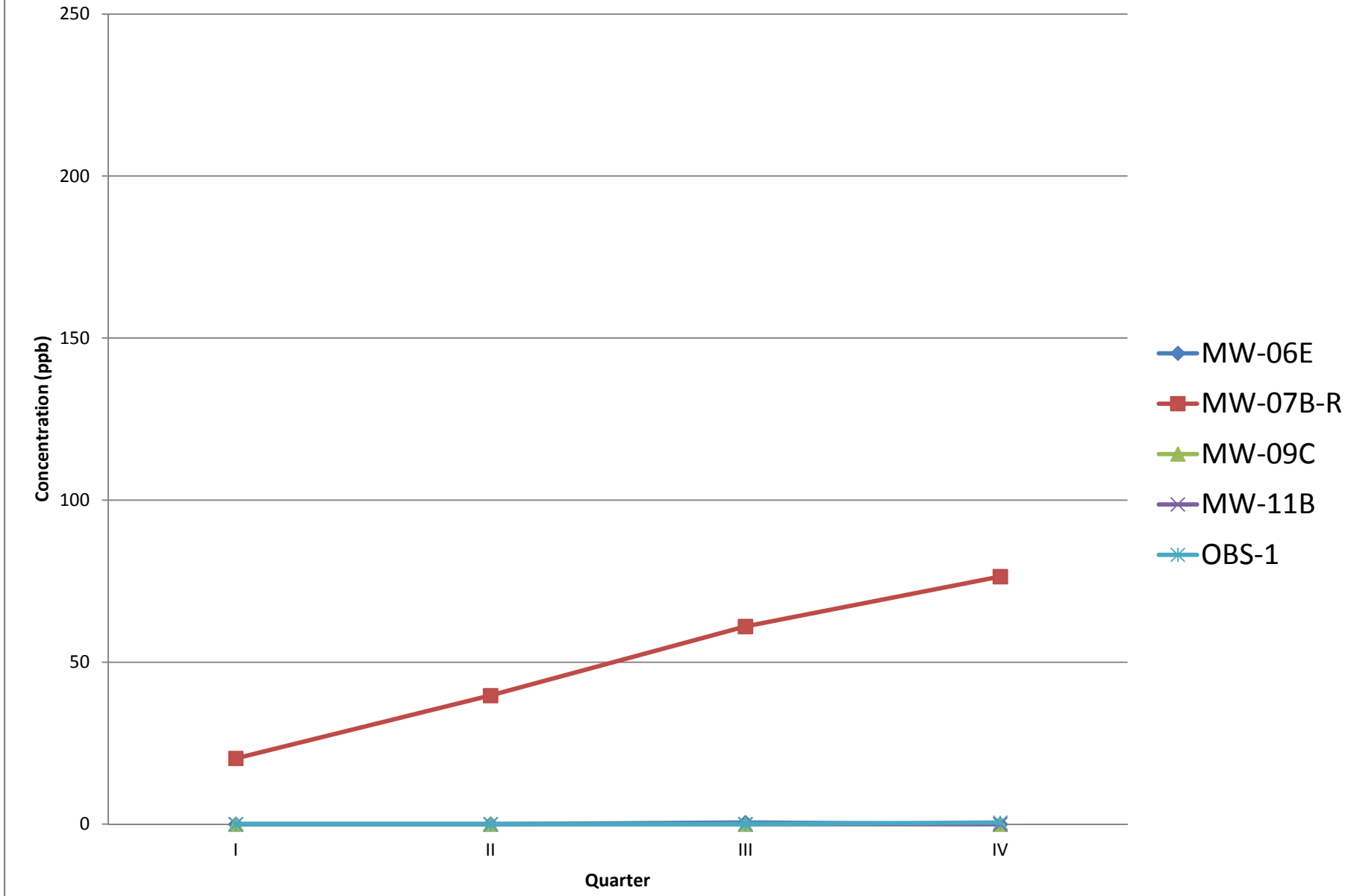


Figure 9. Tetrachloroethylene - Deep Potentiometric Zone

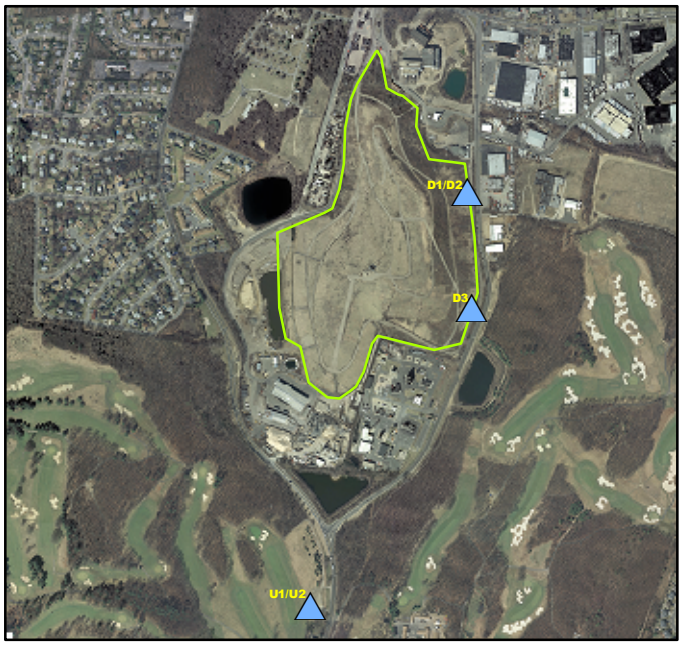


APPENDIX B

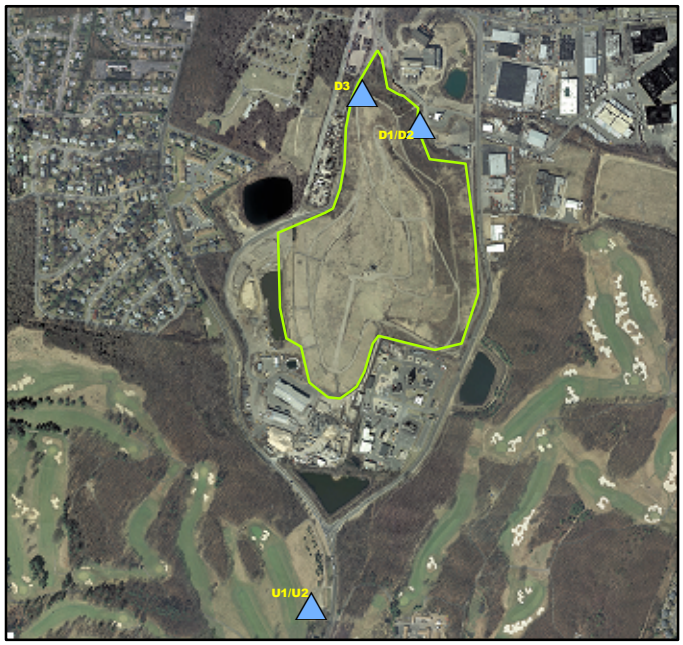
Figures 2.1 and 2.3 and
Appendices A through C (Tables 4.1, 4.2 and 5.1, respectively)
from
"Town of Oyster Bay, Old Bethpage Solid Waste Disposal Complex, Evaluation of Volatile Organic Compounds in Ambient Air, Soil Gas and Soil Gas Pressure Readings, 2011 Annual Summary Report"

RTP Environmental Associates, Inc., June 2012

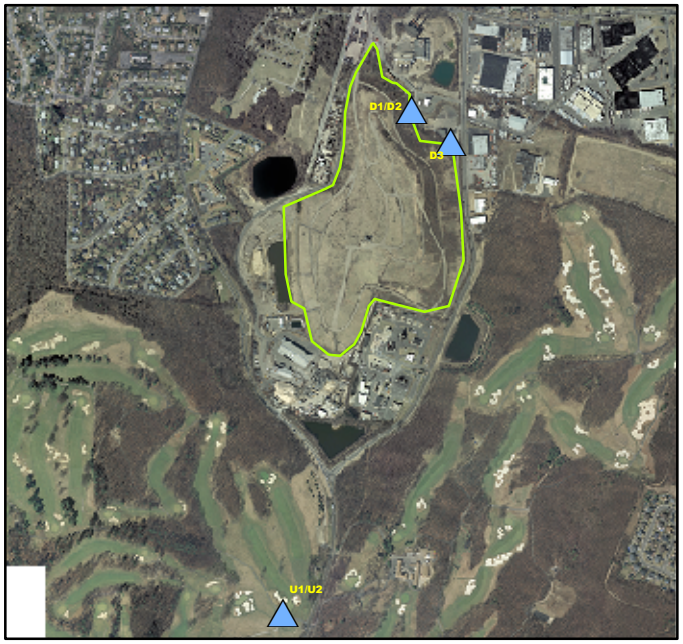
1st Quarter



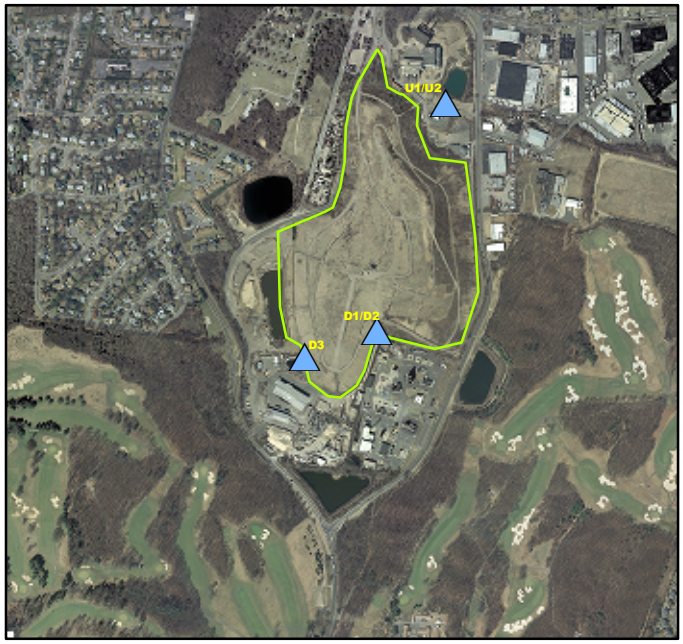
2nd Quarter



3rd Quarter



4th Quarter



Legend

- Ambient Sample
- Landfill Boundary

N

0 750 1,500 3,000 Feet

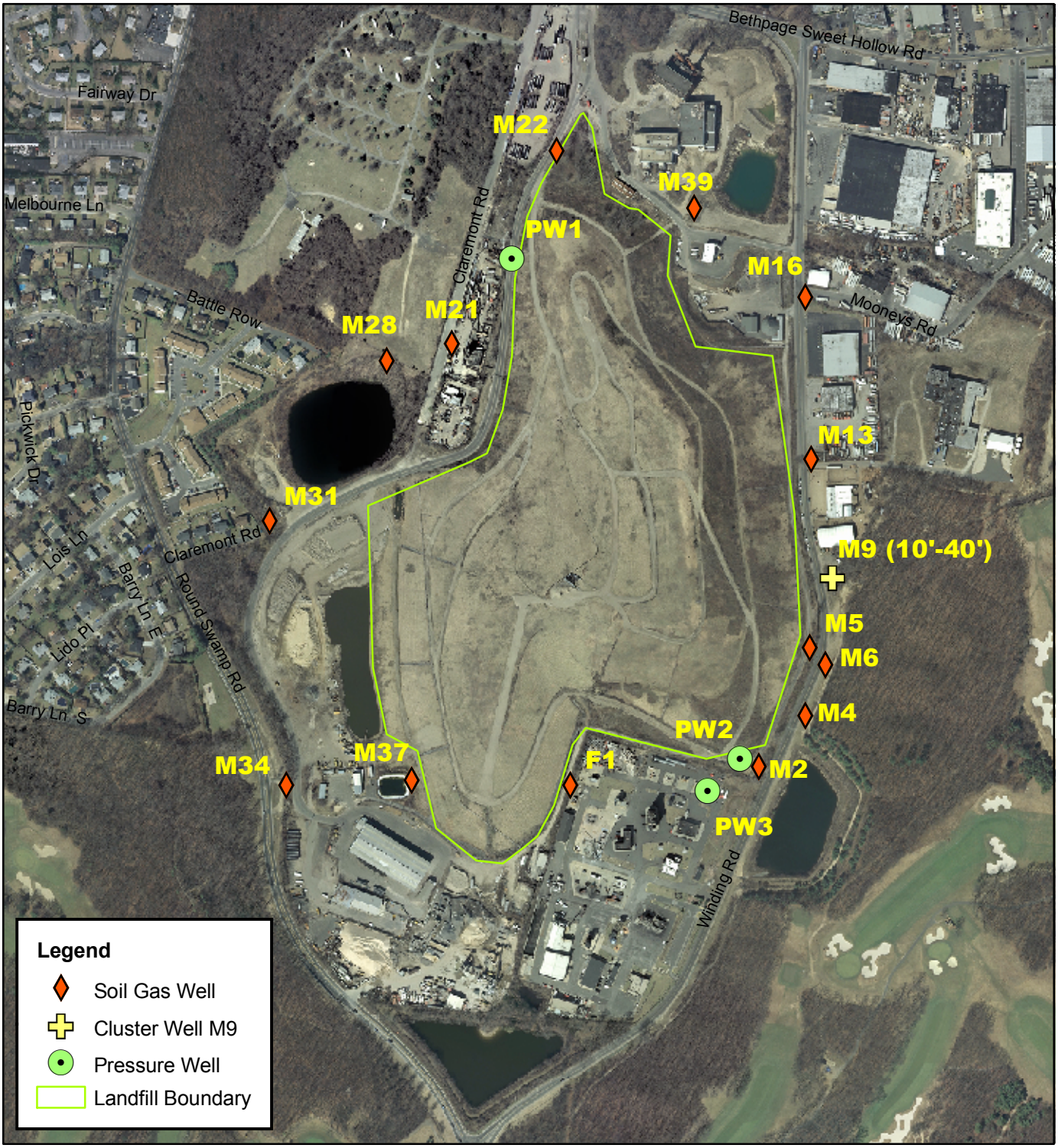
FIGURE 2.1

AMBIENT AIR SAMPLING LOCATIONS FOR 2011 EFFORTS

TOWN OF OYSTER BAY LANDFILL
BETHPAGE, NEW YORK

ORTHOIMAGERY SOURCE:
NYSGIS Clearinghouse 2007

RTP Environmental Associates, Inc.
Westbury, New York



N

0 250 500 1,000 Feet

FIGURE 2.3

SOIL GAS AND PRESSURE WELLS FOR 2011 EFFORTS

TOWN OF OYSTER BAY LANDFILL
BETHPAGE, NEW YORK

ORTHOIMAGERY SOURCE:
NYSGIS Clearinghouse 2007

RTP Environmental Associates, Inc.
Westbury, New York

TABLE 4.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

FIRST QUARTER 2011

	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION[1]	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
LOWER QUANTITATION LIMIT (LQL)	0.0123	0.0488	0.0126	0.0236	0.0245	5	5		
PRACTICAL QUANTITATION LIMIT (PQL)	0.0197	0.0780	0.0202	0.0377	0.0392	8	8		
TARGETED TIC LQL	0.0616	0.2439	0.0630	0.1179	0.123	25	25		
VOC COMPOUND NAME	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	(ng)	(ng)	($\mu g/m^3$)	($\mu g/m^3$)
Acetone[2]	0.32	0.99	0.25	0.48	0.43	11		30,000	180,000
Benzaldehyde[3]	**2.96**	**< 4.05**	**3.53**	**2.08**	**2.82**			0.10	----
Benzene	**0.96**	**< 1.29**	**0.91**	**0.92**	**< 0.94**			0.13	1,300
Bromodichloromethane								70.0	---
Bromoform[2]								0.91	---
Bromomethane		< 0.05	0.02	< 0.03	< 0.03			5.00	3,900
2-Butanone[2]	0.30	< 0.43	0.30	0.31	< 0.29			5,000	13,000
Carbon Disulfide			0.02					700	6,200
Carbon Tetrachloride	**0.59**	**0.76**	**0.58**	**0.63**	**0.62**			0.170	1,900
Chlorobenzene								110	---
Chloroethane								10,000	---
Chloroethyl Vinyl Ether[3]								0.10	----
Chloroform	**0.09**	**< 0.14**	**0.09**	**0.09**	**< 0.09**			0.043	150
Chloromethane	0.08	< 0.16	0.07	< 0.08	< 0.07			90.0	22,000
Dibromochloromethane								0.10	---
1,2-Dichlorobenzene (o)								200	30,000
1,3-Dichlorobenzene (m)								10.0	---
1,4-Dichlorobenzene (p)	0.04	< 0.08	0.05	< 0.05	< 0.08			0.09	---
1,1-Dichloroethane								0.63	---
1,2-Dichloroethane	**0.09**	**< 0.12**	**0.08**	**< 0.09**	**< 0.09**			0.038	---
1,1-Dichloroethene								70.0	---
cis-1,2-Dichloroethene								63.0	---
trans-1,2-Dichloroethene								63.0	----
1,2-Dichloropropane	0.02	< 0.05	0.02	< 0.04	< 0.03			4.00	----
1,3-Dichloropropene, cis & trans isomers								0.25	---
Ethylbenzene	0.30	< 0.40	0.21	< 0.22	< 0.25			1,000	54,000
2/4-Ethyltoluene (total)	**0.15**	**< 0.24**	**0.14**	**< 0.13**	**< 0.15**			0.10	----
Freon 13[3]								5,000	9,000
2-Hexanone[2]					< 0.03	10		30.0	4,000
Methylene Chloride	0.32	0.91	0.33	0.36	0.40	15		2.10	14,000
4-Methyl-2-Pentanone[2]	0.06	< 0.12	0.06	< 0.08	< 0.08			3,000	31,000
Styrene								1,000	17,000
1,1,2,2-Tetrachloroethane								16.0	---
Tetrachloroethene	0.47	< 0.66	0.40	< 0.39	< 0.50			1.00	1,000
Toluene	1.75	< 2.51	1.39	< 1.36	< 1.46			5,000	37,000
1,1,1-Trichloroethane	0.10	0.16	0.05	0.05	0.06			5,000	9,000
1,1,2-Trichloroethane								1.40	---
Trichloroethene	**1.70**	**< 2.76**	**5.04**	**4.81**	**4.19**			0.50	14,000
Trichlorofluoromethane	0.76	1.46	0.83	0.90	0.87			5,000	9,000
Vinyl Chloride								0.11	180,000
Xylenes (Total)	1.21	< 1.73	0.96	< 0.88	< 1.02			100	4,300
Decane[3]	0.30	< 0.50	0.22	< 0.26	< 0.31			700	---

TABLE 4.1
Continued

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

FIRST QUARTER 2011

SAMPLE TYPE	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION (1)	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
ADDITIONAL TIC LQL	0.062	0.244	0.063	0.118	0.123	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-pentane	1.33	2.18	1.28	< 0.84	1.42			4,200	350,000
Pentane	1.06	3.76	1.59	< 1.31	1.76			---	4,200
Cyclic Alkane (DEL)		< 1.10		< 0.51	< 0.63			---	---
Branched Alkane (DEL) (3.6-5.76)				< 1.36				---	---
2-Methyl-butane	1.70	5.66	1.94	< 1.80	< 1.88			42,000	---
Hexane	1.45	< 2.07	1.36	< 1.31	< 1.43			700	---
Isobutane	2.02		1.81					57,000	---
Dichlorodifluoromethane	1.45	< 3.54	1.76	< 1.95	< 1.75			12,000	---
Unknown (RT: 1.19-12.72)				1.65		140		---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu		< 0.76		< 0.58	< 0.53			180,000	960,000
2-Methyl-Hexane		< 1.73			< 0.99			---	---
Butane	2.02	< 3.88	2.17	< 2.09	< 2.24			57,000	---
Propane		< 3.98		< 0.60	< 1.02			12,000	---

NOTES:

[1] See Figure 2.1 for ambient air sampling locations.

[2] An 8 (splitless) nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

[3] Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

[4] This 24-hour guideline concentration was calculated by multiplying the current SGC value (last revised October 2010 and still current as of June 2011) by 0.4 (EPA averaging time adjustment factor).

U1/U2: Ambient upwind samplers collocated on the 15th hole fairway of the Bethpage State Black Golf Course
D1/D2: Ambient downwind samplers collocated on the third footbridge on a landfill access road approximately 75 feet west of Winding Road.
D3: Ambient downwind sampler was located on the first footbridge on a landfill access road approximately 75 feet west of Winding Road.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3) except for the field blank and trip blank mass loading results which are reported in nanograms (ng).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of June 2011) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the analytical results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

SECOND QUARTER 2011

	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION[1]	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
LOWER QUANTITATION LIMIT (LQL)	0.0214	0.0309	0.0136	0.0274	0.0332	5	5		
PRACTICAL QUANTITATION LIMIT (PQL)	0.0342	0.0494	0.0218	0.0438	0.0532	8	8		
TARGETED TIC LQL	0.1068	0.1543	0.0681	0.1370	0.166	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
Acetone[2]	0.73	1.05		0.66	0.83	16		30,000	180,000
Benzaldehyde[3]	**2.52**	**< 1.73**		**< 1.49**	**< 2.14**			0.10	----
Benzene	**0.60**	**0.93**		**0.51**	**0.51**			0.13	1,300
Bromodichloromethane								70.0	---
Bromoform[2]	0.03			< 0.04	< 0.05			0.91	---
Bromomethane								5.00	3,900
2-Butanone[2]	0.28	0.44		0.38	0.42			5,000	13,000
Carbon Disulfide	0.03	< 0.04		< 0.03				700	6,200
Carbon Tetrachloride	**0.40**	**0.50**		**0.31**	**0.33**			0.170	1,900
Chlorobenzene								110	---
Chloroethane								10,000	---
Chloroethyl Vinyl Ether[3]								0.10	----
Chloroform	**0.12**	**0.18**		**0.10**	**0.10**			0.043	150
Chloromethane	0.10	< 0.08		< 0.07	< 0.10			90.0	22,000
Dibromochloromethane								0.10	---
1,2-Dichlorobenzene (o)								200	30,000
1,3-Dichlorobenzene (m)								10.0	---
1,4-Dichlorobenzene (p)	0.06	< 0.05		< 0.08	< 0.08			0.09	---
1,1-Dichloroethane								0.63	---
1,2-Dichloroethane	**0.04**	**< 0.07**		**< 0.05**	**< 0.05**			0.038	---
1,1-Dichloroethene								70.0	---
cis-1,2-Dichloroethene				< 0.03	< 0.05			63.0	---
trans-1,2-Dichloroethene								63.0	----
1,2-Dichloropropane								4.00	----
1,3-Dichloropropene, cis & trans isomers								0.25	---
Ethylbenzene	0.20	< 0.45		< 0.21	< 0.21			1,000	54,000
2/4-Ethyltoluene (total)	**0.12**	**< 0.19**		**< 0.12**	**< 0.13**			0.10	----
Freon 13[3]								5,000	9,000
2-Hexanone[2]								30.0	4,000
Methylene Chloride	0.42	0.33		0.39	0.40	25		2.10	14,000
4-Methyl-2-Pentanone[2]	0.04			< 0.09	< 0.10			3,000	31,000
Styrene								1,000	17,000
1,1,2,2-Tetrachloroethane								16.0	---
Tetrachloroethene	0.26	< 0.66		< 0.40	< 0.38			1.00	1,000
Toluene	1.32	< 3.41		< 1.47	< 1.48			5,000	37,000
1,1,1-Trichloroethane	0.03	< 0.05		< 0.04	< 0.05			5,000	9,000
1,1,2-Trichloroethane								1.40	---
Trichloroethene	0.09	< 0.19		**< 0.62**	**< 0.75**			0.50	14,000
Trichlorofluoromethane	0.56	0.56		0.70	0.59			5,000	9,000
Vinyl Chloride								0.11	180,000
Xylenes (Total)	0.98	< 2.02		< 0.92	< 0.95			100	4,300
Decane[3]	0.19	< 0.36		< 0.25	< 0.30			700	---

TABLE 4.1
Continued

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

SECOND QUARTER 2011

SAMPLE TYPE	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION (1)	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
ADDITIONAL TIC LQL	0.107	0.154	0.068	0.137	0.166	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-pentane	1.07	< 1.77		< 0.78	< 0.91			4,200	350,000
Pentane	0.98	1.98		1.70	1.73			---	4,200
Cyclic Alkane (DEL)		< 1.10		< 0.81				---	---
Branched Alkane (DEL) (5.76)		< 1.84			< 1.05			---	---
2-Methyl-butane	1.32	2.38		2.30	2.16			42,000	---
Hexane	1.24	< 2.30		< 1.16	< 1.21			700	---
Isobutane		< 0.63			< 0.81			57,000	---
Dichlorodifluoromethane	1.71	< 1.59		< 1.55	< 1.84			12,000	---
Unknown (RT: 1.22-12.72)	0.85	< 0.97			2.16	58		---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu				< 0.53	< 0.45			180,000	960,000
Unknown Alcohol (RT: 1.23)				< 1.27				---	---
2-Methyl-Hexane				< 0.97				---	---
Butane	0.77	< 0.76		< 1.38	< 0.95			57,000	---

NOTES:

[1] See Figure 2.1 for ambient air sampling locations.

[2] An 8 (splitless) nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

[3] Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

[4] This 24-hour guideline concentration was calculated by multiplying the current SGC value (last revised October 2010 and still current as of July 2011) by 0.4 (EPA averaging time adjustment factor).

U1/U2: Ambient upwind samplers collocated on the 15th hole fairway of the Bethpage State Black Golf Course
D1/D2: Ambient downwind samplers collocated approximately 75 feet southwest of the southwest corner of the RAP Building.
D3: Ambient downwind sampler was located at the northern tip of the landfill near the main entrance along a landfill access road.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3) except for the field blank and trip blank mass loading results which are reported in nanograms (ng).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of July 2011) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the analytical results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

THIRD QUARTER 2011

	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION[1]	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
LOWER QUANTITATION LIMIT (LQL)	0.0190	0.0286	0.0145	0.0307	0.0278	5	5		
PRACTICAL QUANTITATION LIMIT (PQL)	0.0304	0.0457	0.0233	0.0491	0.0444	8	8		
TARGETED TIC LQL	0.0951	0.1429	0.0727	0.1534	0.139	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
Acetone[2]	0.32	0.45	0.67	0.66	0.48	210		30,000	180,000
Benzaldehyde[3]	**0.38**	**< 0.60**	**0.73**	**< 0.69**	**< 0.65**	160		0.10	----
Benzene	**0.36**	**0.42**	**0.38**	**0.38**	**0.80**	9		0.13	1,300
Bromodichloromethane								70.0	---
Bromoform[2]	0.03	< 0.05	0.07	< 0.06	< 0.06			0.91	---
Bromomethane								5.00	3,900
2-Butanone[2]	0.23	0.36	0.52	0.58	0.48	38		5,000	13,000
Carbon Disulfide			0.02					700	6,200
Carbon Tetrachloride	**0.53**	**0.43**	**0.52**	**0.53**	**0.49**			0.170	1,900
Chlorobenzene								110	---
Chloroethane								10,000	---
Chloroethyl Vinyl Ether[3]								0.10	----
Chloroform	**0.08**	**0.11**	**0.11**	**0.10**	**0.11**			0.043	150
Chloromethane	0.05	< 0.05	0.03		< 0.05			90.0	22,000
Dibromochloromethane								0.10	---
1,2-Dichlorobenzene (o)								200	30,000
1,3-Dichlorobenzene (m)								10.0	---
1,4-Dichlorobenzene (p)	0.05	< 0.06	0.06	< 0.08	< 0.07			0.09	---
1,1-Dichloroethane								0.63	---
1,2-Dichloroethane	**0.04**	**< 0.05**	**0.05**	**< 0.06**	**< 0.05**			0.038	---
1,1-Dichloroethene								70.0	---
cis-1,2-Dichloroethene								63.0	---
trans-1,2-Dichloroethene								63.0	----
1,2-Dichloropropane								4.00	----
1,3-Dichloropropene, cis & trans isomers								0.25	---
Ethylbenzene	0.16	< 0.20	0.16	< 0.18	< 0.18			1,000	54,000
2/4-Ethyltoluene (total)	0.09	**< 0.13**	0.10	**< 0.12**	**< 0.12**			0.10	----
Freon 13[3]								5,000	9,000
2-Hexanone[2]			0.08					30.0	4,000
Methylene Chloride	0.08	0.19	0.20	0.21	0.19			2.10	14,000
4-Methyl-2-Pentanone[2]	0.04	< 0.07	0.14	< 0.07	< 0.08			3,000	31,000
Styrene								1,000	17,000
1,1,2,2-Tetrachloroethane			0.08					16.0	---
Tetrachloroethene	0.25	< 0.18	0.22	< 0.24	< 0.22			1.00	1,000
Toluene	0.80	< 0.96	0.84	< 0.94	< 0.99			5,000	37,000
1,1,1-Trichloroethane	0.03	< 0.04	0.04	< 0.05	0.04			5,000	9,000
1,1,2-Trichloroethane								1.40	---
Trichloroethene	0.03	< 0.03	0.03	< 0.04	< 0.04			0.50	14,000
Trichlorofluoromethane	0.76	0.56	0.84	0.78	0.63			5,000	9,000
Vinyl Chloride								0.11	180,000
Xylenes (Total)	0.72	< 0.90	0.70	< 0.75	< 0.76			100	4,300
Decane[3]	0.07	< 0.15	0.12	< 0.21	< 0.18			700	---

TABLE 4.1
Continued

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

THIRD QUARTER 2011

SAMPLE TYPE	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION (1)	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
ADDITIONAL TIC LQL	0.095	0.143	0.073	0.153	0.139	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-pentane		< 0.93	0.99	0.86	0.72			4,200	350,000
3-Methyl-pentane		< 0.53			< 0.33			4,200	350,000
Pentane			0.58	< 0.51				---	4,200
Cyclic Alkane (DEL)				< 0.54				---	---
Propane+Unknown	1.33	< 0.87						---	---
2-Methyl-butane	0.68	< 0.44	0.90	2.21	< 0.65			42,000	---
Hexane	0.84	< 1.36	1.10	< 0.94	< 0.93			700	---
Cyclopentane				< 4.06				---	---
Isobutane	1.25	< 0.76						57,000	---
Dichlorodifluoromethane	2.62	< 1.36	0.96	< 1.33	< 1.49			12,000	---
1, 3-Butadiene, 2-methyl-		< 0.39	0.93	< 0.60	< 0.46			---	---
Unknown (RT: 1.22-13.64)					< 0.79	166		---	---
1, 3-Butadiene, 2-methyl-+Unknown	0.76							---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu		< 0.39		< 0.48	< 0.46			180,000	960,000
Heptane		< 0.41			< 0.38			3,900	210,000
Cyclopentane, methyl-		< 0.53			< 0.33			700	---
2-Methyl-Hexane		< 0.84		< 0.72	< 0.93			---	---
Butane	0.91	< 0.90	1.13	< 2.32	< 1.18			57,000	---
Nonanal					< 0.40			---	---
Butane, 2,2-dimethyl				< 1.79				4,200	350,000

NOTES:

[1] See Figure 2.1 for ambient air sampling locations.

[2] An 8 (splitless) nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

[3] Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

[4] This 24-hour guideline concentration was calculated by multiplying the current SGC value (last revised October 2010 and still current as of December 2011) by 0.4 (EPA averaging time adjustment factor).

U1/U2: Ambient upwind samplers collocated 100 feet west of Green #16 on the Bethpage State Black Golf Course.
D1/D2: Ambient downwind samplers collocated approximately 75 feet southwest of the southwest corner of the RAP Building.
D3: Ambient downwind sampler was located at the first footbridge near the recycling center along Winding Road.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3) except for the field blank and trip blank mass loading results which are reported in nanograms (ng).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of December 2011) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the analytical results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

FOURTH QUARTER 2011

	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION[1]	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
LOWER QUANTITATION LIMIT (LQL)	0.0115	0.0253	0.0117	0.0474	0.0260	5	5		
PRACTICAL QUANTITATION LIMIT (PQL)	0.0185	0.0405	0.0187	0.0758	0.0416	8	8		
TARGETED TIC LQL	0.0577	0.1266	0.0584	0.2370	0.130	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
Acetone[2]	0.46	0.46	0.49	0.90	0.49	36	100	30,000	180,000
Benzaldehyde[3]	**2.77**	**1.39**	**2.80**	**5.02**	**1.53**		220	0.10	----
Benzene	**0.90**	**0.93**	**0.84**	**1.17**	**0.90**			0.13	1,300
Bromodichloromethane								70.0	---
Bromoform[2]	0.01		0.02					0.91	---
Bromomethane								5.00	3,900
2-Butanone[2]	1.02	0.84	1.19	1.73	0.90	85		5,000	13,000
Carbon Disulfide	0.02		0.02					700	6,200
Carbon Tetrachloride	**0.51**	**0.49**	**0.54**	**0.66**	**0.51**			0.170	1,900
Chlorobenzene								110	---
Chloroethane								10,000	---
Chloroethyl Vinyl Ether[3]								0.10	----
Chloroform	**0.13**	**0.14**	**0.13**	**0.19**	**0.10**			0.043	150
Chloromethane	0.05	< 0.06	0.04	< 0.13	< 0.07			90.0	22,000
Dibromochloromethane								0.10	---
1,2-Dichlorobenzene (o)								200	30,000
1,3-Dichlorobenzene (m)								10.0	---
1,4-Dichlorobenzene (p)	0.04	< 0.05	0.04	< 0.06	< 0.05			0.09	---
1,1-Dichloroethane								0.63	---
1,2-Dichloroethane	**0.09**	**< 0.08**	**0.09**	**< 0.11**	**< 0.09**			0.038	---
1,1-Dichloroethene								70.0	---
cis-1,2-Dichloroethene								63.0	---
trans-1,2-Dichloroethene								63.0	----
1,2-Dichloropropane	0.02	< 0.04	0.03	< 0.05	< 0.04			4.00	----
1,3-Dichloropropene, cis & trans isomers								0.25	---
Ethylbenzene	0.28	< 0.29	0.17	< 0.26	< 0.21			1,000	54,000
2/4-Ethyltoluene (total)	**0.21**	**< 0.24**	**0.11**	**< 0.15**	**< 0.12**			0.10	----
Freon 13[3]								5,000	9,000
2-Hexanone[2]						45		30.0	4,000
Methylene Chloride	0.32	0.37	0.42	0.57	0.49		20	2.10	14,000
4-Methyl-2-Pentanone[2]	0.10	< 0.11	0.11	< 0.15	< 0.10	34		3,000	31,000
Styrene	0.01				< 0.04			1,000	17,000
1,1,2,2-Tetrachloroethane								16.0	---
Tetrachloroethene	0.15	< 0.16	0.16	< 0.25	< 0.18			1.00	1,000
Toluene	1.20	< 1.28	1.03	1.36	< 1.18			5,000	37,000
1,1,1-Trichloroethane	0.06	0.06	0.04	< 0.06	< 0.04			5,000	9,000
1,1,2-Trichloroethane								1.40	---
Trichloroethene	0.39	< 0.42	0.18	< 0.34	< 0.10			0.50	14,000
Trichlorofluoromethane	1.34	1.10	1.14	1.40	1.11			5,000	9,000
Vinyl Chloride								0.11	180,000
Xylenes (Total)	1.27	< 1.30	0.72	< 0.97	< 0.87			100	4,300
Decane[3]	0.25	< 0.31	0.11	< 0.26	< 0.19			700	---

TABLE 4.1
Continued

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR VOST SAMPLE RESULTS

FOURTH QUARTER 2011

SAMPLE TYPE	24-HR AMBIENT AIR SAMPLE					BLANK		CURRENT	24-HOUR
SAMPLE IDENTIFICATION (1)	U1	U2	D1	D2	D3	FB3	TB1	AGC	SGC[4]
ADDITIONAL TIC LQL	0.058	0.127	0.058	0.237	0.130	25	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-pentane	1.29	1.34		< 1.07	< 1.10			4,200	350,000
3-Methyl-pentane		< 0.65		< 0.64	< 0.56			4,200	350,000
Pentane	1.71	1.95	1.38	1.94	1.69			---	4,200
Cyclic Alkane (DEL)				< 0.64				---	---
Propane	2.06	< 2.29	1.73	< 2.77	< 2.61			43,000	---
2-Methyl-butane	2.17	2.58	1.54	2.04	1.87			42,000	---
Hexane	1.52	< 1.48		< 1.35	< 1.29			700	---
Isobutane			1.68		< 1.94			57,000	---
Dichlorodifluoromethane	1.62	< 1.71	1.85	< 2.96	< 1.75			12,000	---
Unknown (RT: 1.13-13.55)			4.67				138	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu		< 0.54		< 0.73				180,000	960,000
Cyclopentane, methyl-		< 0.67			< 0.56			700	---
2-Methyl-Hexane		< 1.10		< 1.11				---	---
Butane	2.29	< 2.59	2.06	< 2.30	< 2.25			57,000	---
Butane, 2,2-dimethyl				< 2.77				4,200	350,000

NOTES:

[1] See Figure 2.1 for ambient air sampling locations.

[2] An 8 (splitless) nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

[3] Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

[4] This 24-hour guideline concentration was calculated by multiplying the current SGC value (last revised October 2010 and still current as of February 2012) by 0.4 (EPA averaging time adjustment factor).

U1/U2: Ambient upwind samplers collocated 75 feet northeast of the northeast corner of the RAP Building.
D1/D2: Ambient downwind samplers collocated in the south central portion of the landfill boundary on the landfill access just northwest of the Nassau County Fire Service Academy.
D3: Ambient downwind sampler was located along a landfill haul road at the southwest corner of the landfill approximately 50 feet east of Discharge Basin No. 1.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3) except for the field blank and trip blank mass loading results which are reported in nanograms (ng).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of February 2012) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the analytical results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.2

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
FIRST QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
LOWER QUANTITATION LIMIT (LQL	0.456	0.466	0.467	0.460	0.469	0.476	0.479	0.940	0.469	5	AGC	SGC
PRACTICAL QUANTITATION LIMIT (PQL	0.730	0.746	0.748	0.736	0.750	0.761	0.766	1.504	0.75	8	---	---
TARGETED TIC LQL	2.28	2.33	2.34	2.30	2.35	2.38	2.39	4.70	2.34	25	---	---
VOC COMPOUND NAME	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	(ng)	($\mu g/m^3$)	($\mu g/m^3$)
Acetone*	1.46	1.59	0.84	1.10	1.31	1.24	1.25	2.63	1.03		30,000	180,000
Benzaldehyde**	**7.12**							**< 22.09**			0.10	----
Benzene											0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*								< 1.50			5000	13,000
Carbon Disulfide											700	6200
Carbon Tetrachloride		**0.56**									0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform					**0.66**		**0.57**	**< 1.13**	**0.84**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane											0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene								< 1.03	1.78		63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride	1.19							**3.01**		14	2.10	14,000
4-Methyl-2-Pentanone*											3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**1.19**					**1.90**	**7.76**	**< 27.73**	**91.85**		1.00	1,000
Toluene											5,000	37,000
1,1,1-Trichloroethane								< 0.94	1.50		5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene											0.50	14,000
Trichlorofluoromethane	1.19	1.21	1.31	1.29	1.22	1.81	1.63	< 1.97	2.72		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**	7.12							< 22.09			700	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
FIRST QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
ADDITIONAL TIC LQI	2.28	2.33	2.34	2.30	2.35	2.38	2.39	4.70	2.34	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(ng)	(µg/m³)	(µg/m³)
Branched Alkane (DEL) (3.6-5.76)											---	---
2-Methyl-butane											42,000	---
Ethane, 1,1-difluoro-		6.62									40,000	---
Ethane, 1,1-dichloro-1,1,2,2-tetrafluoro								< 6.02	7.87		17,000	---
Hexane											700	---
Dichlorodifluoromethane	3.28			3.22		4.19	5.36	< 9.49	12.18		12,000	---
1,1-Dichloro-1-fluoroethane						3.14					---	---
Hexachloroethane											---	---
Unknown (RT: 1.19-12.72)		4.38	6.54								---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu									6.47		180,000	960,000
Heptane											---	---
2-Methyl-Hexane											---	---
Butane				2.48							57,000	---
Hexane, 3-methyl											---	---
Unknown Siloxane (RT: 8.74)		2.61	3.18	2.76	4.22	2.76					---	---
1,3-Pentadiene											---	---
Propane				2.48							12,000	---
Unknown Freon (RT:2.44)											---	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
FIRST QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current AGC	Current SGC
LOWER QUANTITATION LIMIT (LQL	0.486	0.481	-	0.466	0.467	0.469	0.467	0.462	0.955	5		
PRACTICAL QUANTITATION LIMIT (PQL	0.777	0.770	-	0.746	0.748	0.75	0.747	0.739	1.528	8		
TARGETED TIC LQL	2.43	2.41	-	2.33	2.34	2.34	2.33	2.31	4.78	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
Acetone*	1.36	0.96		4.01	1.40	1.59	2.05	1.76	2.10	38	30,000	180,000
Benzaldehyde**							**14.01**	**9.24**	**9.55**		0.10	----
Benzene				**0.65**		**0.94**	**1.03**				0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*											5000	13,000
Carbon Disulfide											700	6200
Carbon Tetrachloride				**0.56**	**0.56**			**0.46**			0.17	1,900
Chlorobenzene							0.75				110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**0.68**					**0.84**					0.043	150
Chloromethane				0.84							90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane											0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene											63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene				0.65		5.15	7.10				1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5,000	9,000
2-Hexanone*										46	30.0	4000
Methylene Chloride					**2.34**				< **2.77**	12	2.10	14,000
4-Methyl-2-Pentanone*							0.93				3,000	31,000
Styrene						3.56	4.86				1,000	17,000
1,1,2,2-Tetrachloroethane										35	16.0	---
Tetrachloroethene	**1.94**	**2.31**				**2.34**	**3.73**		< **6.40**		1.00	1,000
Toluene				13.06	10.28	103.09	168.07	0.74			5,000	37,000
1,1,1-Trichloroethane											5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene											0.50	14,000
Trichlorofluoromethane	1.65	2.21		1.03	1.03	1.22	1.21	1.02	< 1.53		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)				1.87		18.74	23.34				100	4,300
Decane**											700	---

TABLE 4.2
(Concluded)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
FIRST QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current	Current
ADDITIONAL TIC LQL	2.43	2.41	-	2.33	2.34	2.34	2.33	2.31	4.78	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
Branched Alkane (DEL) (3.6-5.76)					4.21						---	---
2-Methyl-butane								4.07			42,000	---
Ethane, 1,1-difluoro-				2.43	9.35			3.33	< 11.94		40,000	---
Ethane, 1,1-dichloro-1,1,2,2-tetrafluoro											17,000	---
Hexane						49.67	23.34				700	---
Dichlorodifluoromethane		6.45									12,000	---
1,1-Dichloro-1-fluoroethane											---	---
Hexachloroethane						10.31	39.22				---	---
Unknown (RT: 1.19-12.72)	11.66			7.00	46.73	8.62	24.28	51.76	< 7.35	2.00E+02	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu											180,000	960,000
Heptane						11.25	13.07				---	---
2-Methyl-Hexane						13.12	19.61				---	---
Butane				2.89				4.16			57,000	---
Hexane, 3-methyl						15.93	23.34				---	---
Unknown Siloxane (RT: 8.74)	3.79	6.16		5.22	3.08			2.77	< 6.02		---	---
1,3-Pentadiene				2.89							---	---
Propane											12,000	---
Unknown Freon (RT:2.44)								2.77			---	---

Notes:

* An 8 nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

** Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3).
- Blank values:

  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.

  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of June 2011) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the Analytical Results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.2

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
SECOND QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
LOWER QUANTITATION LIMIT (LQL	0.503	0.510	0.511	0.499	0.506	0.506	0.507	1.018	0.511	5	AGC	SGC
PRACTICAL QUANTITATION LIMIT (PQL	0.805	0.816	0.817	0.798	0.810	0.810	0.811	1.629	0.82	8	---	---
TARGETED TIC LQL	2.52	2.55	2.55	2.49	2.53	2.53	2.54	5.09	2.55	25	---	---
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
Acetone*	2.01		2.96	2.69	2.43	2.23	1.83	7.84	2.45	14	30,000	180,000
Benzaldehyde**			**14.30**	**19.94**	**12.15**	**13.16**	**10.14**		**15.32**		0.10	----
Benzene											0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*	0.70		1.12	2.09	0.61	0.61	0.71	< 1.43			5000	13,000
Carbon Disulfide				1.10							700	6200
Carbon Tetrachloride											0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**0.91**			**1.60**	**1.82**	**0.81**	**0.61**	**< 1.12**	**0.61**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane											0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene									1.84		63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride	**3.52**		**3.58**	**2.19**	1.92	**2.53**	2.03	**3.26**	**2.25**	14	2.10	14,000
4-Methyl-2-Pentanone*											3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**3.42**		0.72	**2.79**	0.91	**3.85**	**2.94**	**< 14.77**	**77.63**		1.00	1,000
Toluene					0.51						5,000	37,000
1,1,1-Trichloroethane									0.92		5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene									**0.51**		0.50	14,000
Trichlorofluoromethane	0.80		0.61	0.80	0.91	1.62	1.01	< 1.53	1.23		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**			14.30	19.94	12.15	13.16	10.14		15.32		700	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
SECOND QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
ADDITIONAL TIC LQL	2.52	2.55	2.55	2.49	2.53	2.53	2.54	5.09	2.55	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(ng)	(µg/m³)	(µg/m³)
2-Methyl-butane											42,000	---
Ethane, 1,1-difluoro-	6.04										40,000	---
Isobutane											57,000	---
Dichlorodifluoromethane			4.19		5.26	3.54		< 6.11	10.21		12,000	---
1,1-Dichloro-1-fluoroethane	8.35				3.34	3.44					---	---
Undecane					3.14						---	---
Unknown (RT: 1.22-12.72)				12.06	3.54	3.34		5.50		39	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu									4.09		180,000	960,000
Butane											57,000	---
Cyclotrisiloxane, hexamethyl-	4.02		4.49	5.48	4.45	3.64			4.19		---	---
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro									4.49		17,000	---
Nonanal					8.60						---	---
4-Undecane, 6-methyl											---	---
Difluorochloromethane						3.54	11.16	< 6.52			50,000	---
Ethane, 2-chloro-1,1,1,2-tetrafluoro						4.76	9.33	< 5.09			---	---
6-Octenal, 3,7-dimethyl-, (R)-				408.77	4.45		4.56				---	---
5-Hepten-2-one, 6-methyl-											---	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
SECOND QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current AGC	Current SGC
LOWER QUANTITATION LIMIT (LQL	0.504	0.510	-	0.502	0.500	0.510	0.506	0.502	1.009	5		
PRACTICAL QUANTITATION LIMIT (PQL	0.806	0.816	-	0.802	0.800	0.82	0.809	0.803	1.615	8		
TARGETED TIC LQL	2.52	2.55	-	2.51	2.50	2.55	2.53	2.51	5.05	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
Acetone*	2.92	1.84		2.51	4.40	1.84	1.92	1.91	7.16	14	30,000	180,000
Benzaldehyde**									**29.77**		0.10	----
Benzene											0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*				0.60	1.00	0.71			2.83		5000	13,000
Carbon Disulfide	0.81					0.61					700	6200
Carbon Tetrachloride											0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**2.62**	**1.73**				**1.73**		**1.61**	< **5.85**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane	0.70										0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene											63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5,000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride	**2.32**	**2.14**		2.01	**2.70**	**2.35**	**4.25**	**3.31**	< **2.12**	19	2.10	14,000
4-Methyl-2-Pentanone*					68.00			2.91			3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**12.08**	**11.22**				0.51	0.61	0.90	< **24.72**		1.00	1,000
Toluene								0.70			5,000	37,000
1,1,1-Trichloroethane	0.91										5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene	**0.91**										0.50	14,000
Trichlorofluoromethane	1.41	1.43			0.70	0.61	0.61	1.00	< 1.31		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**											700	---

TABLE 4.2
(Concluded)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
SECOND QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current	Current
ADDITIONAL TIC LQL	2.52	2.55	-	2.51	2.50	2.55	2.53	2.51	5.05	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-butane							2.73	5.32			42,000	---
Ethane, 1,1-difluoro-											40,000	---
Isobutane								21.08			57,000	---
Dichlorodifluoromethane	3.93	3.37									12,000	---
1,1-Dichloro-1-fluoroethane								4.12			---	---
Undecane				6.52							---	---
Unknown (RT: 1.22-12.72)	2.82				160.00		2.53	21.08	< 8.27	34	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu											180,000	960,000
Butane								11.04			57,000	---
Cyclotrisiloxane, hexamethyl-	3.42	3.67		4.51	5.40	3.16	5.56	4.92			---	---
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro											17,000	---
Nonanal	3.22										---	---
4-Undecane, 6-methyl		2.96									---	---
Difluorochloromethane											50,000	---
Ethane, 2-chloro-1,1,1,2-tetrafluoro											---	---
6-Octenal, 3,7-dimethyl-, (R)-											---	---
5-Hepten-2-one, 6-methyl-								17.07			---	---

Notes:

* An 8 nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

** Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3).
- Blank values:

  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.

  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of July 2011) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the Analytical Results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.2

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
THIRD QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
LOWER QUANTITATION LIMIT (LQL)	0.513	0.515	0.525	0.501	0.517	0.514	0.514	1.028	0.515	5	AGC	SGC
PRACTICAL QUANTITATION LIMIT (PQL)	0.821	0.824	0.840	0.802	0.827	0.823	0.823	1.644	0.82	8	---	---
TARGETED TIC LQL	2.56	2.57	2.63	2.51	2.59	2.57	2.57	5.14	2.57	25	---	---
VOC COMPOUND NAME	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	(ng)	($\mu g/m^3$)	($\mu g/m^3$)
Acetone*	1.03	2.78	1.58	3.11				2.26	1.24	12	30,000	180,000
Benzaldehyde**											0.10	----
Benzene											0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*		3.09		0.90							5000	13,000
Carbon Disulfide				1.60							700	6200
Carbon Tetrachloride											0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**6.26**	**1.13**	**0.95**	**4.21**	**1.03**	**0.72**	**0.72**	**< 1.03**	**0.72**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane											0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene								< 1.03	1.75		63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride											2.10	14,000
4-Methyl-2-Pentanone*											3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**4.82**	**1.13**	0.95	**5.81**	**1.03**	**10.08**	**9.47**	**34.53**	**95.78**		1.00	1,000
Toluene		0.82									5,000	37,000
1,1,1-Trichloroethane									1.44		5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene								**< 1.03**	**0.93**		0.50	14,000
Trichlorofluoromethane	1.44	0.72	0.84	1.40	0.62	2.57	1.44	< 1.54	1.54		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**					2.90						700	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
THIRD QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current AGC	Current SGC
LOWER QUANTITATION LIMIT (LQL)	0.514	0.510	-	0.510	0.510	0.515	0.508	0.511	1.019	5		
PRACTICAL QUANTITATION LIMIT (PQL)	0.823	0.816	-	0.816	0.815	0.82	0.812	0.817	1.631	8		
TARGETED TIC LQL	2.57	2.55	-	2.55	2.55	2.58	2.54	2.55	5.10	25		
VOC COMPOUND NAME	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	(ng)	($\mu g/m^3$)	($\mu g/m^3$)
Acetone*	1.03	1.53		1.84	0.92		1.93		5.71	18	30,000	180,000
Benzaldehyde**										38	0.10	----
Benzene				**0.82**							0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*							1.42	0.92	2.65		5000	13,000
Carbon Disulfide											700	6200
Carbon Tetrachloride				**0.71**				**0.82**			0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**8.95**	**4.90**				**2.68**	**2.03**	**3.27**	< **2.65**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)				**1.02**							0.09	---
1,1-Dichloroethane	**0.82**										0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene											63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5,000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride									< 1.83	59	2.10	14,000
4-Methyl-2-Pentanone*											3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**36.01**	**21.43**		0.92	0.61	0.93	**1.02**	0.92	< **36.19**		1.00	1,000
Toluene				1.33				0.61			5,000	37,000
1,1,1-Trichloroethane	3.19	0.71						0.92			5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene	**1.85**										0.50	14,000
Trichlorofluoromethane	2.57	1.53		0.71	0.82	0.62	0.71	0.82	< 1.33		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**				3.37							700	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
THIRD QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
ADDITIONAL TIC LQI	2.56	2.57	2.63	2.51	2.59	2.57	2.57	5.14	2.57	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(ng)	(µg/m³)	(µg/m³)
Norflurane						7.00	10.29				80,000	---
Branched Alkane (DEL) (11.85-12.32)											---	---
Unknown Alkene(RT: 1.47)	3.59										---	---
Propane+Unknown											---	---
Ethane, 1,1-difluoro-	5.03										40,000	---
Hexane								< 7.40			700	---
alpha-Pinene isomer (RT: 10.68)			115.55								---	---
Isobutane	11.28										57,000	---
Dichlorodifluoromethane				4.31	3.10				9.89		12,000	---
1,1-Dichloro-1-fluoroethane	4.00					2.57					---	---
beta-Pinene isomer (RT:11.35)			77.73								---	---
Ethane, 2-chloro-1,1,1,2-tetrafluor							9.67	< 8.84	4.33		---	---
Cyclotetrasiloxane, octamethyl-				3.81							360	---
Unknown (RT: 1.22-13.64)											---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu									4.74		180,000	960,000
Cyclotrisiloxane, hexamethyl-						5.76					---	---
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro								< 6.37	7.00		17,000	---
Nonanal						2.67					---	---
1,4-Cyclohexadiene, 1-methyl-4-(1-m			42.02								---	---
Difluorochloromethane						46.30	61.73	< 38.54	9.99		50,000	---
D-Limonene isomer			24.16								---	---
6-Octenal, 3,7-dimethyl-, (R)-			53.57								---	---
Cyclohexane, 1-methyl-4-(1-methylet			91.39								---	---

TABLE 4.2
(Concluded)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
THIRD QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current	Current
ADDITIONAL TIC LQL	2.57	2.55	-	2.55	2.55	2.58	2.54	2.55	5.10	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(µg/std-m³)	(ng)	(µg/m³)	(µg/m³)
Norflurane											80,000	---
Branched Alkane (DEL) (11.85-12.32)				13.27							---	---
Unknown Alkene(RT: 1.47)											---	---
Propane+Unknown								16.34			---	---
Ethane, 1,1-difluoro-											40,000	---
Hexane									< 5.30	400	700	---
alpha-Pinene isomer (RT: 10.68)				17.35							---	---
Isobutane								8.48			57,000	---
Dichlorodifluoromethane	4.42	3.78			2.85				< 5.40		12,000	---
1,1-Dichloro-1-fluoroethane											---	---
beta-Pinene isomer (RT:11.35)											---	---
Ethane, 2-chloro-1,1,1,2-tetrafluor											---	---
Cyclotetrasiloxane, octamethyl-	4.01										360	---
Unknown (RT: 1.22-13.64)				7.14						47	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu											180,000	960,000
Cyclotrisiloxane, hexamethyl-	2.88				3.06	2.89			< 5.10	44	---	---
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro											17,000	---
Nonanal	4.12			18.37							---	---
1,4-Cyclohexadiene, 1-methyl-4-(1-m											---	---
Difluorochloromethane											50,000	---
D-Limonene isomer				13.27							---	---
6-Octenal, 3,7-dimethyl-, (R)-											---	---
Cyclohexane, 1-methyl-4-(1-methylet								17.36			---	---

Notes:

* An 8 nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

** Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of December 2011) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the Analytical Results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 4.2

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
FOURTH QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current	Current
LOWER QUANTITATION LIMIT (LQL	0.509	0.513	0.518	0.506	0.517	0.513	0.510	1.027	0.513	5	AGC	SGC
PRACTICAL QUANTITATION LIMIT (PQL	0.815	0.821	0.829	0.810	0.826	0.821	0.815	1.643	0.82	8	---	---
TARGETED TIC LQL	2.55	2.56	2.59	2.53	2.58	2.57	2.55	5.13	2.57	25	---	---
VOC COMPOUND NAME	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	($\mu g/std\text{-}m^3$)	(ng)	($\mu g/m^3$)	($\mu g/m^3$)
Acetone*	4.99	2.87		1.32		1.23	1.43	6.57	1.03		30,000	180,000
Benzaldehyde**	**7.43**	**4.72**		**4.96**	**4.03**	**3.90**	**3.67**	**15.40**			0.10	----
Benzene											0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*	4.48	1.85					0.92				5000	13,000
Carbon Disulfide											700	6200
Carbon Tetrachloride											0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**0.51**						**0.61**	**< 1.23**	**1.23**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane									**0.72**		0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene									0.82		63.0	---
trans-1,2-Dichloroethene								< 1.23	3.29		63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride	1.02	1.23					1.12				2.10	14,000
4-Methyl-2-Pentanone*											3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**1.73**					**4.93**	**7.03**	**< 29.26**	**133.47**		1.00	1,000
Toluene											5,000	37,000
1,1,1-Trichloroethane								< 1.13	2.26		5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene									**1.03**		0.50	14,000
Trichlorofluoromethane	1.63	1.33	1.04	1.01	1.03	1.64	1.53	< 2.36	2.57		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**											700	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
FOURTH QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current AGC	Current SGC
LOWER QUANTITATION LIMIT (LQL	0.484	0.515	-	0.509	0.511	0.512	0.510	0.512	1.015	5		
PRACTICAL QUANTITATION LIMIT (PQL	0.774	0.825	-	0.815	0.818	0.82	0.816	0.819	1.624	8		
TARGETED TIC LQL	2.42	2.58	-	2.55	2.56	2.56	2.55	2.56	5.08	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
Acetone*	3.97	1.86		1.83	1.33	1.13	1.53	1.02	8.02		30,000	180,000
Benzaldehyde**							**3.67**	**3.89**	**15.13**		0.10	----
Benzene											0.13	1300
Bromodichloromethane											70.0	---
Bromoform*											0.91	---
Bromomethane											5.00	3900
2-Butanone*	3.10			0.92							5000	13,000
Carbon Disulfide											700	6200
Carbon Tetrachloride											0.17	1,900
Chlorobenzene											110	---
Chloroethane											10,000	---
Chloroethyl Vinyl Ether**											0.10	----
Chloroform	**1.06**	**0.62**		**0.51**		**0.72**			< **1.12**		0.043	150
Chloromethane											90.0	22,000
Dibromochloromethane											0.10	---
1,2-Dichlorobenzene (o)											200	30,000
1,3-Dichlorobenzene (m)											10.0	---
1,4-Dichlorobenzene (p)											0.09	---
1,1-Dichloroethane											0.63	---
1,2-Dichloroethane											0.038	---
1,1-Dichloroethene											70.0	---
cis-1,2-Dichloroethene											63.0	---
trans-1,2-Dichloroethene											63.0	----
1,2-Dichloropropane											4.00	----
1,3-Dichloropropene, cis & trans isomers											0.25	---
Ethylbenzene											1,000	54,000
2/4-Ethyltoluene (total)											0.10	----
Freon 13**											5,000	9,000
2-Hexanone*											30.0	4000
Methylene Chloride									< **2.94**		2.10	14,000
4-Methyl-2-Pentanone*	1.45										3,000	31,000
Styrene											1,000	17,000
1,1,2,2-Tetrachloroethane											16.0	---
Tetrachloroethene	**7.94**	**4.43**							< **10.66**		1.00	1,000
Toluene											5,000	37,000
1,1,1-Trichloroethane	0.87										5,000	9,000
1,1,2-Trichloroethane											1.40	---
Trichloroethene	0.48										0.50	14,000
Trichlorofluoromethane	1.36	1.55		1.02	0.92	1.02	1.22	1.13	< 1.42		5,000	9,000
Vinyl Chloride											0.11	180,000
Xylenes (Total)											100	4,300
Decane**											700	---

TABLE 4.2
(Continued)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
FOURTH QUARTER 2011

SOIL GAS WELL ID	F1	M2	M4	M5	M6	M9(10)	M9(20)	M9(30)	M9(40)	FB1	Current AGC	Current SGC
ADDITIONAL TIC LQI	2.55	2.56	2.59	2.53	2.58	2.57	2.55	5.13	2.57	25		
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-butane											42,000	---
Ethane, 1,1-difluoro-											40,000	---
alpha-Pinene isomer (RT: 10.68)			29.02								---	---
Isobutane											57,000	---
Dichlorodifluoromethane	7.74	4.21	3.52	3.44				< 5.85	16.43		12,000	---
1,1-Dichloro-1-fluoroethane	15.27										---	---
beta-Pinene isomer (RT:11.35)			3.32								---	---
Unknown (RT: 1.13-13.55)		2.97								26	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu									8.62		180,000	960,000
Butane											57,000	---
Cyclotrisiloxane, hexamethyl-	4.38				2.58	3.39	3.57	< 5.95	2.77		---	---
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro									11.29		17,000	---
Nonanal						3.70					---	---
Isopropyl Alcohol								< 5.54			---	---
Difluorochloromethane							10.09	< 8.83			50,000	---

TABLE 4.2
(Concluded)

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SOIL GAS VOST SAMPLE RESULTS
ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS
FOURTH QUARTER 2011

SOIL GAS WELL ID	M13	M16	M21	M22	M28	M31	M34	M37	M39	FB2	Current	Current
ADDITIONAL TIC LQL	2.42	2.58	-	2.55	2.56	2.56	2.55	2.56	5.08	25	AGC	SGC
VOC COMPOUND NAME	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(µg/std-m^3)	(ng)	(µg/m^3)	(µg/m^3)
2-Methyl-butane				2.95							42,000	---
Ethane, 1,1-difluoro-				8.66							40,000	---
alpha-Pinene isomer (RT: 10.68)											---	---
Isobutane				2.65							57,000	---
Dichlorodifluoromethane	3.10	3.20			2.86	2.97	2.86	3.38	< 6.50		12,000	---
1,1-Dichloro-1-fluoroethane						5.63	13.27	7.57	< 5.08		---	---
beta-Pinene isomer (RT:11.35)											---	---
Unknown (RT: 1.13-13.55)		5.88						2.76		27	---	---
Ethane, 1,1,2-trichloro-1,2,2-triflu											180,000	960,000
Butane				3.26							57,000	---
Cyclotrisiloxane, hexamethyl-	3.29			3.97	3.27	2.87	3.16				---	---
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro											17,000	---
Nonanal											---	---
Isopropyl Alcohol											---	---
Difluorochloromethane											50,000	---

Notes:

* An 8 nanogram practical quantitation limit has been assigned to these compounds due to their poor responses during laboratory analysis.

** Targeted Tentatively Identified Compound (TIC). As reported by the laboratory, Targeted TICs have a Lower Quantitation Limit that is five (5) times the targeted compound Lower Quantitation Limit.

- All values are reported in micrograms per standard cubic meter (µg/std-m^3).
- Blank values:
  Targeted Compounds and Targeted TICs- All blank values are below the Lower Quantitation Limit, Practical Quantitation Limit (applies to Acetone, Bromoform, 2-Butanone, 4-Methyl-2-Pentanone and 2-Hexanone), or the Targeted TIC Lower Quantitation Limit (applies to Chloroethyl vinyl ether, Freon 13 and Decane). Benzaldehyde has a LQL 2 times the targeted TIC LQL.
  Additional Tentatively Identified Compounds- All blank values are either below the Targeted TIC Lower Quantitation Limit where less than six (6) additional TICs are reported for a particular sample or below the lowest reported additional TIC value, where six (6) or more additional TICs are reported for a particular sample.
- Values in shaded areas are at or exceed the level of the current (last revised October 2010 and still current as of February 2012) and/or previous ambient air Annual Guideline Concentration (AGC) values.
- Less than values (<) are used where the Lower Quantitation Limit, the Target TIC Lower Quantitation Limit, or the Practical Quantitation Limit is averaged with the reported values.
- Freon 13 is listed as Chlorotrifluoromethane in the Analytical Results, Appendix C.
- (µg/std-m^3): micrograms per standard cubic meter
- (ng): nanograms

TABLE 5.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SUMMARY OF SOIL GAS PRESSURE TESTS

FIRST QUARTER 2011

SAMPLE ID	DATE (mm/dd/yy)	TIME (EDT)	WELL ID	WELL LOCATION	WELL DEPTH (feet)	READINGS (INCHES H2O)
P1	03/08/11	8:25 AM	PW1	NW corner of the landfill on Haul Road	10	-0.04
P2	03/08/11	8:25 AM	PW1	NW corner of the landfill on Haul Road	20	-0.10
P3	03/08/11	8:26 AM	PW1	NW corner of the landfill on Haul Road	10	-0.04
P4	03/08/11	8:26 AM	PW1	NW corner of the landfill on Haul Road	20	-0.10
P5	03/08/11	8:16 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P6	03/08/11	8:16 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.10
P7	03/08/11	8:17 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P8	03/08/11	8:17 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.10
P9	03/08/11		PW3	Nassau County Fire Service Academy	10	MD
P10	03/08/11		PW3	Nassau County Fire Service Academy	20	MD
P11	03/08/11		PW3	Nassau County Fire Service Academy	10	MD
P12	03/08/11		PW3	Nassau County Fire Service Academy	20	MD

NOTES:

- Measurements taken using a ten inch Dwyer inclined manometer.
- Leak checks were performed on manometer before testing each well.
- The blower station was not operating during the pressure well tests on March 2, 2011; therefore, positive pressure readings were recorded. RTP retested the wells on March 8, 2011 when the blower station was once again fully operational. The data above is representative of the March 8 test.

MD: Missing Data due to car obstruction.

TABLE 5.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SUMMARY OF SOIL GAS PRESSURE TESTS

SECOND QUARTER 2011

SAMPLE ID	DATE (mm/dd/yy)	TIME (EDT)	WELL ID	WELL LOCATION	WELL DEPTH (feet)	READINGS (INCHES H2O)
P1	06/16/11	12:06 PM	PW1	NW corner of the landfill on Haul Road	10	0.00
P2	06/16/11	12:06 PM	PW1	NW corner of the landfill on Haul Road	20	-0.04
P3	06/16/11	12:07 PM	PW1	NW corner of the landfill on Haul Road	10	0.00
P4	06/16/11	12:07 PM	PW1	NW corner of the landfill on Haul Road	20	-0.04
P5	06/16/11	11:20 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P6	06/16/11	11:20 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.07
P7	06/16/11	11:21 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P8	06/16/11	11:21 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.07
P9	06/16/11	11:34 AM	PW3	Nassau County Fire Service Academy	10	0.00
P10	06/16/11	11:34 AM	PW3	Nassau County Fire Service Academy	20	-0.17
P11	06/16/11	11:35 AM	PW3	Nassau County Fire Service Academy	10	0.00
P12	06/16/11	11:35 AM	PW3	Nassau County Fire Service Academy	20	-0.17

NOTES:

- Measurements taken using a ten inch Dwyer inclined manometer.
- Leak checks were performed on manometer before testing each well.
- The blower station was not operating during the ambient and soil gas well tests consucted from May 26-27, 2011; therefore, RTP tested the wells on June 16, 2011 when the blower station was once again operational.

TABLE 5.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SUMMARY OF SOIL GAS PRESSURE TESTS

THIRD QUARTER 2011

SAMPLE ID	DATE (mm/dd/yy)	TIME (EDT)	WELL ID	WELL LOCATION	WELL DEPTH (feet)	PRESSURE* (inches H_2O)
P1	09/14/11	7:05 AM	PW1	NW corner of the landfill on Haul Road	10	0.00
P2	09/14/11	7:06 AM	PW1	NW corner of the landfill on Haul Road	20	-0.03
P3	09/14/11	7:06 AM	PW1	NW corner of the landfill on Haul Road	10	0.00
P4	09/14/11	7:08 AM	PW1	NW corner of the landfill on Haul Road	20	-0.03
P5	09/14/11	6:57 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P6	09/14/11	6:57 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.05
P7	09/14/11	6:58 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P8	09/14/11	6:58 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.05
P9	09/14/11	7:20 AM	PW3	Nassau County Fire Service Academy	10	0.00
P10	09/14/11	7:20 AM	PW3	Nassau County Fire Service Academy	20	0.05
P11	09/14/11	7:22 AM	PW3	Nassau County Fire Service Academy	10	0.00
P12	09/14/11	7:22 AM	PW3	Nassau County Fire Service Academy	20	0.05

NOTES:

- Measurements taken using a ten inch Dwyer inclined manometer.
- Leak checks were performed on manometer before testing each well.

* Pressure of well relative to ambient pressure.

TABLE 5.1

TOWN OF OYSTER BAY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

SUMMARY OF SOIL GAS PRESSURE TESTS

FOURTH QUARTER 2011

SAMPLE ID	DATE (mm/dd/yy)	TIME (EDT)	WELL ID	WELL LOCATION	WELL DEPTH (feet)	PRESSURE* (inches H2O)
P1	12/14/11	7:17 AM	PW1	NW corner of the landfill on Haul Road	10	-0.02
P2	12/14/11	7:17 AM	PW1	NW corner of the landfill on Haul Road	20	-0.15
P3	12/14/11	7:18 AM	PW1	NW corner of the landfill on Haul Road	10	-0.02
P4	12/14/11	7:18 AM	PW1	NW corner of the landfill on Haul Road	20	-0.15
P5	12/14/11	7:07 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P6	12/14/11	7:07 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.09
P7	12/14/11	7:08 AM	PW2	SE corner of the landfill NW of Well M2	10	0.00
P8	12/14/11	7:08 AM	PW2	SE corner of the landfill NW of Well M2	20	-0.09
P9	12/14/11	7:40 AM	PW3	Nassau County Fire Service Academy	10	0.00
P10	12/14/11	7:40 AM	PW3	Nassau County Fire Service Academy	20	-0.37
P11	12/14/11	7:41 AM	PW3	Nassau County Fire Service Academy	10	0.00
P12	12/14/11	7:41 AM	PW3	Nassau County Fire Service Academy	20	-0.37

NOTES:

- Measurements taken using a ten inch Dwyer inclined manometer.
- Leak checks were performed on manometer before testing each well.

* Pressure of well is relative to ambient pressure.