

Mr. Jason Pelton
Project Manager
New York State Department of Environmental Conservation
Remedial Bureau D
625 Broadway
Albany, New York 12233-7015

Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation
Remedial Action, Bureau A
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7015

Subject:
2016 Annual Operation, Maintenance and Monitoring Report, Operable Unit 3 -
Groundwater, Bethpage, New York, NYSDEC Site #1-30-003A.

Dear Jason and Steve:

On behalf of Northrop Grumman Systems Corporation (Northrop Grumman), Arcadis is providing the NYSDEC with the enclosed 2016 Annual Operation, Maintenance and Monitoring Report (Report). This Report was prepared to document the operation, maintenance and monitoring activities conducted for the on-site portion of the Operable Unit 3 groundwater remedy.

Arcadis of New York, Inc.
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610
www.arcadis.com

ENVIRONMENT

Date:
March 31, 2017

Contact:
David E. Stern

Phone:
631.391.5284

Email:
David E. Stern@arcadis.com

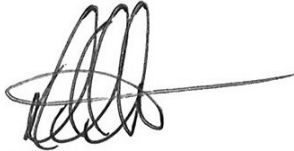
Our ref:
NY001496.1416.RPT14

Jason Pelton and Steven Scharf, P.E.
March 31, 2017

If you have any questions, please do not hesitate to contact us.

Sincerely,

Arcadis of New York, Inc.

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

David E. Stern
Senior Hydrogeologist

Enclosure

Copies:

Ed Hannon, Northrop Grumman
Fred Weber, Northrop Grumman
Donald Hesler, NYSDEC
Steven Karpinski, New York State Department of Health
Joseph DeFranco, Nassau County Department of Health
Robert Alvey, USEPA
Lorenzo Thantu, USEPA
Ahren Tatro, Arcadis
Paul Martorano, Arcadis
Christopher Engler, Arcadis
Carlo San Giovanni, Arcadis
Public Repository
File

Northrop Grumman Systems Corporation

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT

Operable Unit 3 – Groundwater
Bethpage, New York
NYSDEC ID # 1-30-003A

March 31, 2017




2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT
Operable Unit 3 – Groundwater
Bethpage, New York
NYSDEC ID # 1-30-003A



Ahren Tatro, PE 095069
Staff Engineer



Paul Martorano, PE 088403
Project Engineer



Christopher Engler, PE 069748
Engineer of Record



Carlo San Giovanni
Project Manager

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT

Operable Unit 3 – Groundwater
Bethpage, New York
NYSDEC ID # 1-30-003A

Prepared for:
Northrop Grumman Systems Corporation

Prepared by:
Arcadis of New York, Inc.
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610

Our Ref.:
NY001496.1416.RPTI4

Date:
March 31, 2017

CONTENTS

1. Introduction	4
2. Bethpage Park Groundwater Containment System Objectives	5
3. Bethpage Park Groundwater Containment System Description	5
4. Operation and Maintenance Activities	6
4.1 Fourth Quarter 2016	6
4.2 Annual System Performance and Alarm Summary	7
5. System Monitoring Activities	8
5.1 2016 System Monitoring Activities	8
5.2 Summary of Monitoring Results and Conclusions	9
5.2.1 System Operation and Effectiveness	9
5.2.2 Regulatory Status of Discharges	11
5.2.2.1 Air Discharge	11
5.2.2.2 Water Discharge	12
6. Environmental Effectiveness Monitoring	12
6.1 Hydraulic Monitoring	12
6.1.1 Activities	12
6.2 Groundwater Quality Monitoring	12
6.2.1 Activities	12
6.2.2 Results	13
6.3 Environmental Effectiveness Monitoring Conclusions	13
7. Recommendations	13
8. References	14

TABLES

Table 1	Operational Summary
Table 2	Summary of Influent Water Sample Analytical Results
Table 3	Summary of Effluent Water Sample Analytical Results
Table 4	Summary of Influent Vapor Sample Analytical Results

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT
Operable Unit 3 – Groundwater
Bethpage, New York
NYSDEC ID # 1-30-003A

Table 5	Summary of Effluent Vapor Sample Analytical Results
Table 6	Summary of Effluent Vapor Tentatively Identified Compounds
Table 7	Summary of System Parameters
Table 8	Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates
Table 9	Summary of Air Quality Impact Analysis
Table 10	Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells
Table 11	Concentrations of Metals in Groundwater Samples Collected from Remedial Wells
Table 12	Summary of Water-Level Elevations
Table 13	Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells
Table 14	Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells

FIGURES

Figure 1	Site Location
Figure 2	Site and Groundwater Containment System
Figure 3	Groundwater Treatment System Process Schematic, Process Flow Diagram, and Monitoring Locations
Figure 4	Groundwater Monitoring Network Site Plan
Figure 5	Cumulative Total, Project, and Non-Project VOC Mass Removed Through December 2016
Figure 6A	Remedial Well Total VOC Concentrations Through December 2016
Figure 6B	Remedial Well Project VOC Concentrations Through December 2016
Figure 6C	Remedial Well Non-Project VOC Concentrations Through December 2016
Figure 7	Influent Total, Project, and Non-Project VOC Concentrations Through December 2016
Figure 8A	Total VOC Mass Recovery Rates Through December 2016
Figure 8B	Project VOC Mass Recovery Rates Through December 2016
Figure 8C	Non-Project VOC Mass Recovery Rates Through December 2016

APPENDICES

A	Well Construction Information and Environmental Effectiveness Monitoring Program
B	Compliance and Performance Program

1. INTRODUCTION

Pursuant to the Administrative Order on Consent (AOC) Index #W1-0018-04-01 (New York State Department of Environmental Conservation [NYSDEC] 2005) and the Operable Unit 3 (OU3) Record of Decision (NYSDEC 2013), Arcadis of New York, Inc. (Arcadis), on behalf of Northrop Grumman Systems Corporation (Northrop Grumman), has prepared this OU3 Bethpage Park Groundwater Containment System (BPGWCS) Annual Summary Report for submittal to the NYSDEC. The present-day Bethpage Community Park property (Park), the McKay Field, and Plant 24 Access Road, which the NYSDEC has termed the “Former Grumman Settling Ponds Area” and designated as OU3, are referred to herein as the Site Area. Figure 1 provides a Site Area location map.

The BPGWCS (previously referred to as the Groundwater Interim Remedial Measure) has been operational since July 21, 2009. The operation, maintenance, and monitoring (OM&M) activities performed during 2016 (i.e., January 1 through December 31, 2016 [the “reporting period”]) are summarized in this Annual Summary Report. This report also describes the Operation, Maintenance, and Monitoring (OM&M) activities performed during the fourth quarter of 2016 (i.e., October 1 through December 31, 2016 [the “fourth quarter reporting period”]). Data summaries for the previous three 2016 quarterly operational periods are available in the following letter reports:

- Results of First Quarter 2016 System Operation and Monitoring for the Bethpage Park Groundwater Containment System, May 2016 (Arcadis 2016a)
- Results of Second Quarter 2016 System Operation and Monitoring for the Bethpage Park Groundwater Containment System, August 2016 (Arcadis 2016b)
- Results of Third Quarter 2016 System Operation and Monitoring for the Bethpage Park Groundwater Containment System, November 2016 (Arcadis 2016c)

During this reporting period, Remedial System and Environmental Effectiveness Monitoring Programs were conducted in accordance with the NYSDEC-approved OU3 Groundwater Interim Operation, Maintenance, and Monitoring Manual (OM&M Manual; Arcadis 2016).

As discussed in the OU3 Site Area Remedial Investigation Report (Site Area RI) (Arcadis 2011), Northrop Grumman does not take responsibility for certain compounds (e.g., Freon 12 and Freon 22) present in Site Area groundwater. Throughout this Annual Report, a distinction is made between “Project” and “Non-Project” volatile organic compounds (VOCs), defined as follows:

- Project VOCs: VOCs that may be related to former Northrop Grumman historical activities. For this OM&M Report, Project VOCs include 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene (TCE); vinyl chloride (VC); cis-1,2-dichloroethene (cis-1,2-DCE); trans-1,2-dichloroethene; benzene; toluene; and total xylenes.
- Non-Project VOCs: VOCs, such as Freon 12 and Freon 22, that are understood to be unrelated to former Northrop Grumman activities but have been detected in Site Area groundwater. As noted in the Site Area RI (Arcadis 2011), a sub-plume of Freon 22 has been identified originating from the area of the Town of Oyster Bay’s (Town’s) former ice rink (shown on Figure 2). Based on Town information (Zervos 2007), Freon 22 was used by the Town and released to the environment.

2. BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM OBJECTIVES

Remedial action objectives (RAOs) for the BPGWCS are as follows:

- Mitigate the off-site migration of dissolved-phase VOCs. Specifically, the BPGWCS addresses:
 - Groundwater that has total VOC concentrations greater than 5 micrograms per liter ($\mu\text{g/L}$) in the upper 20 feet of the surficial aquifer across the 1,200-foot-wide lateral extent of the Site Area southern boundary.
 - Groundwater below the upper 20 feet of the surficial aquifer that has total VOC concentrations greater than 50 $\mu\text{g/L}$ across the 1,200-foot-wide lateral extent of the Site Area southern boundary.
- Comply with applicable NYSDEC standards, criteria, and guidance values (SCGs) for treated water and air emissions.

A secondary benefit of the BPGWCS is the creation of a clean-water front atop downgradient groundwater, which minimizes the potential for vapor intrusion downgradient of the Site Area.

3. BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM DESCRIPTION

The BPGWCS consists of:

- A pump-and-treat system where groundwater is:
 - Extracted along the Plant 24 Access Road via four remedial wells
 - Conveyed to a treatment plant at McKay Field via four underground pipelines
 - Treated via air stripping to reduce concentrations of Project and Non-Project VOCs to comply with applicable NYSDEC SCGs for treated water
 - Filtered to remove oxidized metals to comply with applicable NYSDEC SCGs for treated water
 - Returned to the aquifer via a discharge pipeline routed to a recharge basin located on the adjacent former Bethpage Navy Weapons Industrial Reserve Plant property
- A vapor-phase treatment system that reduces concentrations of Project VOCs in the air stripper off-gas prior to discharge to the atmosphere
- A groundwater monitoring network periodically monitored to assess environmental effectiveness of the BPGWCS

Major components of the BPGWCS are as follows:

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT

Operable Unit 3 – Groundwater

Bethpage, New York

NYSDEC ID # 1-30-003A

- Four remedial wells (RW-1, RW-2, RW-3, and RW-4) with design pumping rates of 30 gallons per minute (gpm), 75 gpm, 75 gpm, and 30 gpm, respectively; for a total design influent flow rate of 210 gpm.
- One low-profile air stripper to remove VOCs from extracted groundwater prior to discharge to the recharge basins.
- Two bag filter units configured so that one is operational and the other is in standby mode. The system control logic automatically switches from the operational filter unit to the standby filter unit when the bag filter is full to prevent a system shutdown and the spent filters are then replaced.
- Four emission control units, two containing vapor-phase granular-activated carbon and two containing potassium permanganate-impregnated zeolite, to treat Project VOCs in the air stripper off-gas.
- A groundwater monitoring network, consisting of 35 monitoring locations, including 17 groundwater monitoring wells, four remedial wells, and 14 piezometers.

The OM&M Manual (Arcadis 2016) provides additional information on the BPGWCS. Figure 2 shows the layout of the BPGWCS, and Figure 3 provides a schematic drawing. Figure 4 shows groundwater sampling locations that form the groundwater monitoring network. Appendix A provides construction details for the monitoring wells and piezometers.

4. OPERATION AND MAINTENANCE ACTIVITIES

4.1 Fourth Quarter 2016

The BPGWCS operated continuously, at either full or reduced flow, during the fourth quarter of 2016, with the exception of shutdown periods for routine maintenance and alarm conditions.

- The BPGWCS operated at full or reduced capacity 80 out of 92 days (87 percent uptime).
- Based on groundwater volume recorded at the remedial well flow meters, remedial wells operated at average flow rates of 26 gpm (RW-1), 62 gpm (RW-2), 64 gpm (RW-3), and 26 gpm (RW-4). The observed average flow rates for all remedial wells were lower than their design flow rates due to approximately 298 hours of downtime attributed to the routine maintenance activities, pipe modifications, pipe cleaning and alarm-related treatment system downtime. Remedial wells operated at reduced instantaneous flow rates (between 90 percent and 97 percent of design) during portions of the reporting period due to iron buildup in the pumps, influent pipelines, and valves. The reduced flow rates were corrected by adjusting the manifold globe valves and conducting influent pipe cleaning.
- The system was monitored either through site visits or remotely by wireless computer link-up.
- The Supervisory Control and Data Acquisition System operated as designed, and when conditions warranted (see below), the system shut down automatically and instantaneously, and notified plant operators of system advisories and alarms.
- Intentional system shutdowns were as follows (see Table 1 for more information):

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT

Operable Unit 3 – Groundwater

Bethpage, New York

NYSDEC ID # 1-30-003A

- Modification of the existing RW-2 cleanout and installation of two additional pipe cleanouts for RW-2 and RW-3 (October 12 – October 20, 2016);
- Combined quarterly/ semi-annual/ annual maintenance (October 20 – October 26, 2016); and,
- Influent pipeline cleaning to remove iron deposits in RW-2 and RW-3 (October 31 – November 2, 2016).
- System shutdowns due to alarm conditions were as follows (see Table 1 for more information):
 - Air stripper high pressure alarms (October 6 and October 21, 2016): The problem was caused by increased blower pressure. The solution was to adjust the alarm set point and restart the system.
 - Influent manifold low pressure alarm at RW-2 (December 18, 2016): The problem was caused by decreased well performance. The solution was to adjust the alarm set point and restart the system.
 - Air stripper low air flow alarm (December 29, 2016): The solution was to increase the blower speed by adjusting the blower variable frequency drive (VFD) frequency and restart the system.

4.2 Annual System Performance and Alarm Summary

The 2016 system operational up-time is provided on Table 1 and summarized below. System shut downs that occurred in 2016 are summarized below, and are described in the three 2016 Quarterly Reports (ARCADIS 2016a, ARCADIS 2016b, and ARCADIS 2016c) and in this report. In general, system operation in 2016 is consistent with operation in previous years.

In 2016:

- The system operated full-time, 351 out of 365 days (96% uptime).
- The remedial wells operated at reduced flow rates during portions of the year due to iron build-up in the pumps, influent pipelines and valves. The reduced flow rates were corrected by adjusting the manifold globe valves or through the performance of periodic system maintenance (i.e. pulling and replacing the remedial well pumps, and valve cleaning). Other, non-periodic maintenance was also performed to correct the reduced flow rates experienced at the recovery wells. This non-periodic maintenance included the modification of the existing RW-2 cleanout and the installation of two additional cleanouts for RW-2 and RW-3 and influent pipeline cleaning of the RW-2 and RW-3 influent lines. Following influent pipeline cleaning, the recovery wells operated at or above their operational minimum values. Future influent pipeline cleaning will be scheduled, as necessary, to maintain flow rates and lessen the overall uptime impacts associated with iron fouling.
- There were twenty-seven (27) system shutdowns, of which:
 - Three (3) shutdowns were due to overvoltage from the power supply. Following each shutdown, the system was restarted when voltage normalized.
 - Six (6) shutdowns were for system maintenance (e.g. periodic preventative system maintenance, remedial well maintenance, and required system repairs/upgrade).

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT

Operable Unit 3 – Groundwater

Bethpage, New York

NYSDEC ID # 1-30-003A

- Eighteen (18) shutdowns were due to alarm conditions encountered during the normal operation of the system:
 - o Eight (8) alarm conditions were due to well alarms (e.g. low pressure, motor overload). As noted above, these problems were corrected by replacing the motors and pumps at RW-2 and RW-3.
 - o One (1) alarm condition was due to a bag filter differential high pressure alarm resulting from multiple bag changes. The solution was to change out the bag filters and restore normal operations as soon as feasible.
 - o Seven (7) alarm conditions were due to an air stripper high pressure alarm. As noted above, the problem was corrected by adjusting the set-point.
 - o One (1) alarm condition was due to a building high sump level. This problem was corrected by draining the sump and resetting the alarm.
 - o One (1) alarm condition was due to an air stripper low air flow alarm. The problem was corrected by adjusting the air stripper blower variable frequency drive and resetting the alarm.
- There were approximately 31 days of reduced flow, including:
 - RW-2 downtime of approximately 31 days due to motor and pump overload conditions.

For the most part, the system was able to be restarted without incident the same day or the day following an alarm. OM&M activities were conducted in accordance with the NYSDEC-approved OU3 Groundwater Interim Operation, Maintenance, and Monitoring Manual (OM&M Manual; Arcadis 2016).

5. SYSTEM MONITORING ACTIVITIES

5.1 2016 System Monitoring Activities

The following compliance and performance monitoring activities were conducted during this fourth quarter reporting period (see Appendix B, Appendix B-1 for a summary of the compliance and performance monitoring program requirements):

- Three (3) sampling events to collect required water samples and air samples
- Ten (10) weekly site visits to monitor and record key system operational parameters

System O&M results for the annual reporting period are summarized in the following tables and figures:

- Operational Summary, including monitoring events, system operational days, and noteworthy site activities (Table 1);
- Summary of Influent and Effluent Water Sample Analytical Results (Tables 2 and 3, respectively) - Table 3 also provides the BPGWCS treatment system removal efficiency;
- Summary of Influent and Effluent Vapor Sample Analytical Results and Summary of Effluent Vapor Tentatively Identified Compounds (Tables 4, 5 and 6, respectively) - Table 5 also provides the BPGWCS treatment system removal efficiency;

- Summary of System Parameters, including flow rates, line pressures, and temperatures (Table 7);
- Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates (Table 8) - Table 8 provides a breakdown of these parameters by Remedial Well and System and breaks down the VOC mass recovered and VOC recovery rates into Project, Non-Project, and total VOCs;
- Cumulative Total, Project, and Non-Project VOC Mass Removed (Figure 5);
- Remedial Well Total, Project, and Non-Project VOC Concentrations (Figures 6A, 6B, and 6C, respectively);
- Influent Total, Project, and Non-Project VOC Concentrations (Figure 7); and,
- Total, Project, and Non-Project VOC Mass Recovery Rates (Figures 8A, 8B, and 8C, respectively).

5.2 Summary of Monitoring Results and Conclusions

5.2.1 System Operation and Effectiveness

Fourth quarter and annual BPGWCS monitoring results and conclusions are summarized below:

- Total volume of groundwater recovered and treated (Table 8):
 - Fourth quarter 2016: 25.2 million gallons
 - 2016 Annual Total: 105.5 million gallons
 - Cumulative total since system startup: 767 million gallons
- Total VOC mass recovered (Table 8 and Figure 8A):
 - Fourth Quarter 2016: 7.9 pounds (lbs) of VOCs
 - 2016 Annual Total: 44 lbs of VOCs
 - Cumulative total since system startup: 2,155 lbs of VOCs
- VOC mass recovered and mass removal rates (Table 8 and Figures 8A, 8B, and 8C):
 - Majority of VOCs recovered during the fourth quarter reporting period were Project VOCs (88.6 percent or 7.0 lbs). The majority of VOCs recovered during the 2016 reporting period were Project VOCs (88.1 percent or 39 lbs).
 - Majority of Project VOCs are recovered by RW-2 (94.3 percent during the fourth quarter reporting period and 95.3 percent during the 2016 reporting period) and RW-3 (4.9 percent during the fourth quarter reporting period and 3.6 percent during the 2016 reporting period)
 - Majority of Non-Project VOCs are recovered by RW-4 (37.0 percent during the fourth quarter reporting period and 38.4 percent during the 2016 reporting period), RW-3 (37.0 percent during the fourth quarter reporting period and 33.8 percent during the 2016 reporting period), and RW-2 (28.0 percent during the fourth quarter reporting period and 28.6 percent during the 2016 reporting period).
- Treatment system influent concentrations (Table 2 and Figures 6A, 6B, 6C, and 7):

2016 ANNUAL OPERATION, MAINTENANCE AND MONITORING REPORT

Operable Unit 3 – Groundwater

Bethpage, New York

NYSDEC ID # 1-30-003A

- Project VOC influent concentration, which was 27 µg/L during the fourth quarter reporting period, is consistent with historical values. Project VOC influent concentration was generally stable over the 2016 reporting period. These concentrations are well below the recent peak concentration observed in 2014 (105 µg/L). Project VOC influent concentrations have generally decreased since 2010.
- Non-Project VOC influent concentration, which was 3.7 µg/L during the fourth quarter reporting period, is consistent with historical values. Non-Project VOC influent concentration generally decreased over the 2016 reporting period. These concentrations are below the recent peak concentration observed in 2014 (55 µg/L). Non-Project VOC influent concentrations have generally decreased since 2010.
- Total iron in the influent sample was detected at a level of 3,140 µg/L during the fourth quarter reporting period, which is consistent with historical values. Total iron in the effluent samples ranged from 205 µg/L to 622 µg/L during the fourth quarter reporting period, which is slightly above the total iron discharge limit of 600 µg/L. The elevated total iron detection (622 µg/L) was likely due to iron precipitates in the sample tap. Total iron in both the influent and the effluent samples was generally stable over the 2016 reporting period.
- Mercury has not been detected in any influent or effluent sample since system startup.
- Project VOCs in Remedial Wells RW-1, RW-3, and RW-4 (Table 10) were not detected during the fourth quarter reporting period above applicable SCGs and generally decreased in concentration during the 2016 reporting period. In Remedial Well RW-2, several Project VOCs (cis-1,2-DCE, toluene, TCE, and VC) have remained stable or decreased in concentration over the 2016 reporting period, however they continue to be detected above applicable SCGs. Similar to total influent concentrations, Project VOC remedial well concentrations have generally decreased since 2010, with Project VOCs not detected above applicable SCGs in Remedial Well RW-3 since November 2013, or in RW-1 and RW-4 since system startup.
- Non-Project VOCs in Remedial Wells RW-1, RW-2, RW-3 and RW-4 (Table 10) were not detected above applicable SCGs during the fourth quarter reporting period. Similar to total influent concentrations, Non-Project VOC remedial well concentrations have generally decreased during the 2016 reporting period and since 2010, with Non-Project VOCs not detected above applicable SCGs in Remedial Wells RW-1, RW-2, or RW-4 since system startup. Only two detections of Non-Project VOCs have been above applicable SCGs in RW-3 since system startup.
- Metals concentrations in remedial wells during this reporting period (Table 11) are consistent with historical metals concentrations.
- The air stripper, air stripper off-gas treatment system, and bag filter system performed within acceptable operating ranges for this reporting period, as indicated by:
 - The air stripper VOC removal efficiency was greater than 99.9 percent for Project and Non-Project VOCs (Table 3).
 - With the exception of iron, both water and air discharges complied with applicable SCGs and discharge limits (Tables 3, 5, and 8).

5.2.2 Regulatory Status of Discharges

5.2.2.1 Air Discharge

Influent concentrations for the annual period were compared with the degree of cleaning required pursuant to 6NYCRR III A Part 212-2.3(b). As shown on Table 4, concentrations of all compounds detected were less than $14,963 \mu\text{g}/\text{m}^3$ (concentration equivalent to 0.1 pounds per hour at a flow rate of 1,772 cubic feet per minute). Therefore, air dispersion modeling is necessary to demonstrate that the maximum off-site air concentration is less than the NYSDEC DAR-1 annual and short-term guideline concentrations (AGC/SGC) values issued August 10, 2016.

The U.S. Environmental Protection Agency (USEPA) air quality dispersion model AERMOD was executed to estimate the highest ambient air concentration of the compounds on Table 4. AERMOD is the USEPA's recommended best state-of-the-art practice Gaussian plume dispersion model. Gaussian models are the most widely used techniques for estimating the impact of non-reactive pollutants, per Appendix W of Title 40 Code of Federal Regulations (CFR) 51 – Guideline of Air Quality Models.

The following parameters were used for the AERMOD model analysis:

- Urban dispersion coefficients
- AERMAP base and terrain elevations, processed using National Elevation Dataset (NED) digitized terrain data
- Surface and upper air observations measured at the Nation Weather Service stations located at Farmingdale and Brookhaven airports for calendar years 2011-2015, in accordance with NYSDEC's DAR-10 Air Dispersion Modeling Guidance Document. This longer period of time was reviewed for the model run, to provide a conservative estimate of atmospheric impacts on the off-site concentrations.
- Discrete receptor grids, per the following methodology:
 - Receptors were located along the property boundary at distances not exceeding 25 meters;
 - A 1.5 km x 1.5 km Cartesian grid receptors with distances of 50 meters between the receptors; and
 - A 3.0 km x 3.0 km Cartesian grid receptors with distances of 100 meters between the receptors.
- Emission rate: 1 gram per second (g/s)

Based on the model, the maximum one-hour ambient air impact from all the years was 3,153.03 $[\mu\text{g}/\text{m}^3]/[\text{g}/\text{s}]$ and the maximum annual ambient air impact was 96.49 $[\mu\text{g}/\text{m}^3]/[\text{g}/\text{s}]$. Table 9 provides the compound specific scaled hourly ambient air impact and the scaled annual ambient air impact for the fourth quarter sampling event. As shown, the scaled ambient air impacts for the BPGWCS are below the corresponding SGCs and AGCs.

Based on the ambient modeling analysis, the BPGWCS effluent air discharge currently meets all of the requirements for DAR-1 and is below the Rule 212 requirements.

5.2.2.2 Water Discharge

The BPGWCS-treated water effluent met NYSDEC regulatory requirements during the reporting period (Table 3 and Appendix B), as indicated by the following:

- The measured concentration of individual VOCs in the treated water effluent were below applicable discharge limits, per the interim State Pollutant Discharge Elimination System (SPDES) equivalency permit.
- The measured concentration of total iron in the treated water effluent was below applicable discharge limits, with the exception of the December effluent sample iron detection, as noted in Section 5.2.1. In addition, total mercury continues to be non-detect and has not been detected in any treated water effluent sample since system startup.

6. ENVIRONMENTAL EFFECTIVENESS MONITORING

BPGWCS environmental effectiveness (i.e., hydraulic monitoring and groundwater quality monitoring) activities and results for this reporting period are discussed below.

6.1 Hydraulic Monitoring

6.1.1 Activities

In accordance with OM&M Manual requirements and methodologies (ARCADIS 2016), a quarterly round of groundwater hydraulic monitoring was performed during the reporting period. Specifically, depth-to-water measurements were completed on November 8, 2016 at the 42 locations forming the approved monitoring well network (Figure 4).

Table 12 summarizes results of depth-to-water measurements to date.

6.2 Groundwater Quality Monitoring

6.2.1 Activities

An annual groundwater sampling round was performed in December 2016 to January 2017 as part of site-wide sampling activity. Groundwater samples were collected from 13 monitoring wells included in the OU3 OM&M Manual (Arcadis 2016). A Hydraulic Effectiveness Evaluation (HEE) of the BPGWCS was performed in 2014-2015 (ERM 2015). As part of the HEE, a total of 6 monitoring wells and 6 piezometers were installed. Groundwater samples were also collected during this annual round from 4 of the monitoring wells installed during the HEE (MW-204-1, MW-205-1, MW-206-1 and MW-208-1). Monitoring Wells MW-207A and MW-207B, installed during the HEE, were assessed and found to be unusable. These monitoring wells will be replaced in 2017. A Phase 2 HEE will be conducted in 2017 consistent with the “Work Plan for Supplemental Groundwater Characterization Bethpage Park Groundwater Containment System”, dated September 30, 2016 (EMAGIN 2016).

Groundwater samples collected from the 17 monitoring wells were analyzed for Target Compound List (TCL) VOCs, plus Freon 12 and Freon 22, using USEPA Method 8260C, 1,4-Dioxane using USEPA Method 522 SIM and total and dissolved metals (cadmium and chromium) using USEPA Method 6010.

6.2.2 Results

Groundwater quality data, including historical results to date, are summarized in Table 13 (VOCs and 1,4-Dioxane) and Table 14 (metals).

6.3 Environmental Effectiveness Monitoring Conclusions

An evaluation of the hydraulic control of the BPGWCS will be performed when the Phase 2 HEE is completed. The results will be reviewed as appropriate and provided to NYSDEC for comments.

7. RECOMMENDATIONS

- The system is operating as intended and as stated in the HEE the BPGWCS is effective in controlling shallow Project and Non-Project VOCs in groundwater at and below the water table (down to a depth of at least 175 feet below grade surface).
- The presence of toluene was indicated in deep groundwater during the Phase 1 HEE. This will be further evaluated during the Phase 2 HEE, which will be completed in 2017.
- Remove mercury from the SPDES equivalency monitoring program because mercury has not been detected in any system effluent water sample analyzed for mercury.

8. REFERENCES

- Arcadis of New York, Inc. (Arcadis). 2016. DRAFT Operation, Maintenance, and Monitoring Manual, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. March 2016.
- Arcadis. 2011. Remedial Investigation Report (Site Area). Operable Unit 3 – Former Grumman Settling Ponds, Bethpage, New York. NYSDEC Site #1-30-003A. February 8, 2011.
- Arcadis. 2012. Operation, Maintenance, and Monitoring Report for the Groundwater Interim Remedial Measure, 2011 Annual Summary Report. Operable Unit 3 – Former Grumman Settling Ponds, Bethpage, New York. NYSDEC Site #1-30-003A. March 23, 2012.
- Arcadis. 2016a. Results of First Quarter 2016 System Operation and Monitoring, May 2016, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. NYSDEC ID #1-30-003A. May 27, 2016.
- Arcadis. 2016b. Results of Second Quarter 2016 System Operation and Monitoring, August 2016, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. NYSDEC ID #1-30-003A. August 26, 2016.
- Arcadis. 2016c. Results of Third Quarter 2016 System Operation and Monitoring, November 2016, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. NYSDEC ID #1-30-003A. November 23, 2016.
- EMAGIN. Work Plan for Supplemental Groundwater Characterization, Bethpage Park Groundwater Containment System. September 30, 2016.
- ERM Consulting and Engineering, Inc. (ERM). 2015. Bethpage Park Groundwater Containment System Hydraulic Effectiveness Evaluation Report. July 2015.
- New York State Department of Environmental Conservation (NYSDEC). 2005. Order on Consent, Index #W1-0018-04-01, Site #1-30-003A, July 4, 2005.
- NYSDEC. 2009. Interim State Pollution Discharge Elimination System (SPDES) Letter, March 19, 2009.
- NYSDEC. 2013. Record of Decision, Northrop Grumman – Bethpage Facility, Operable Unit Number: 03, State Superfund Project, Bethpage, Nassau County, Site No. 130003A, March 29, 2013.
- NYSDEC. 2014. DAR-1 AGC/SGC Tables, Revised February 28, 2014.
- Zervos, Theodore. 2007. Deposition of Theodore Zervos in the matter Town of Oyster Bay v. Northrop Grumman Systems Corporation et al. Case No. 05-CV-1945 (TCP)(AKT). January 22, 2007.

TABLES



Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

MONTH	DAY																															Days Operational (1)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31																				
2009 Total																																160																			
2010 Total																																352																			
2011 Total																																351																			
2012 Total																																353																			
2013 Total																																354																			
2014 Total																																349																			
2015 Total																																348																			
Jan-16		b			(3)										(4)					b							(5)b							31																	
Feb-16	#b									b			(6)b		b					(7)	b						b					#			29																
Mar-16	b	b								b										(8)bb	bb			(9)			(10)				b				31																
1Q 2016																																91																			
Apr-16	###/**** (11)	b			b	(12)									b					#											(13)b				30																
May-16		b				b				(14)	(15)	bb	b							b	#						b				b				b	29															
Jun-16	b				b					b	###/****				b																			b	(18)	b	30														
2Q 2016																																89																			
Jul-16		(19)b			(20)b					b					b	#																			(21)		b	30													
Aug-16	b					b				(22)	b																								###/****	b				b	31										
Sep-16					b						(23)	bb	b	#	b																							b	(25)b	30											
3Q 2016																																91																			
Oct-16						(26)b									#	(27)																							(28)b	b	b	b	b	b	b	b	b	(29)	21		
Nov-16					b	b				b																																		#	b			28			
Dec-16						b																																										(31)		b	31
4Q 2016																																80																			
2016 Total																																351																			
TOTAL																																2,618																			

Legend:

- Indicates system online for at least the majority of the day.
- Indicates system operated with reduced flow rates.
- Indicates system off-line for at least the majority of the day.
- ## Indicates water compliance samples were collected.
- # Indicates water performance samples were collected.
- ** Indicates vapor compliance samples were collected.
- * Indicates vapor performance samples were collected.
- b Indicates filter bag unit changed over.
- K Indicates PPZ change-out.
- C Indicates carbon change-out.

Acronyms/Key:

- 1Q first quarter
- ECU emission control unit
- VPGAC vapor phase granular activated carbon
- PPZ potassium permanganate-impregnated zeolite
- RW recovery well

Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

Notes:

- (1) Days in which the system was operational for the majority of the day are counted as one day.
- (2) Spent bag filters are stored in DOT certified 55-gallon drums and disposed of by a subcontractor as non-hazardous waste.

First Quarter 2016

- (3) The system shut down at 7:32 pm on January 6, 2016 due to a motor overload condition at RW-2. After an attempt to restart by resetting the breaker at RW-2, the system was left offline. The alarm was cleared and the system was restarted at 8:40 am on January 7, 2016, however RW-2 was left offline. The system was offline for approximately 13 hours.
- (4) The system shut down at 9:09 pm on January 16, 2016 due to a motor overload condition at RW-3. The breaker at RW-3 was reset, the alarm was cleared, and the system was restarted at 11:18 am on January 17, 2016. The system was offline for approximately 14 hours.
- (5) The system was shut down at 9:00 am on January 27, 2016 to install a new pump and motor in RW-2. The system was restarted at 3:50 pm the same day and was offline for approximately 7 hours. RW-2 was offline for a total of 21 days.
- (6) The system shut down at 6:40 pm on February 13, 2016 due to overvoltage from the power supply. The system was restarted at 7:10 am on February 14, 2016 following voltage normalization and was offline for approximately 12.5 hours.
- (7) The system shut down at 9:50 am on February 20, 2016 due to overvoltage from the power supply. The system was restarted at 11:50 am on the same day following voltage normalization and was offline for approximately 2 hours.
- (8) The system shut down at 4:33 pm on March 20, 2016 due to a bag filter differential high pressure alarm resulting from multiple bag filter changes. The alarm was cleared, both of the bag filters changed and the system restarted at 10:12 am on March 21, 2016. The system was offline for approximately 18 hours.
- (9) The system shut down at 7:11 am on March 23, 2016 due to a low flow alarm at the RW-2 influent manifold. The alarm was cleared and the system was restarted at 8:08 am on the same day, however RW-2 was left offline. The system was offline for approximately 1 hour.
- (10) The system shut down at 4:00 am on March 26, 2016 due to a low pressure alarm at the RW-2 influent manifold. The system was restarted at 10:45 am the same day, and was offline for approximately 7 hours.
- (11) First quarter air and water sampling was completed on April 1, 2016 due to downtime associated with RW-2 in March.

Second Quarter 2016

- (12) The system was shut down at 7:15 am on April 6, 2016 for flow control verification. The system was restarted at 11:20 am on the same day and was offline for approximately 4 hours.
- (13) The system was shut down at 8:30 am on April 27, 2016 for calibration activities. The system was restarted at 10:46 am on the same day and was offline for approximately 2 hours.
- (14) The system shut down at 3:47 pm on May 10, 2016 due to a low pressure alarm at the RW-2 influent manifold. The alarm was cleared and the system was restarted at 4:45 pm on the same day, however RW-2 was left offline. The system was offline for approximately 1 hour.
- (15) The system was shut down at 11:25 am on May 11, 2016 to replace the pumps in RW-2 and RW-3. When the new pump was installed in RW-2, an issue was noted with the newly installed pump. New pumps were ordered and installed in RW-2 and RW-3 on May 12, 2016. The system was restarted at 12:00 pm on May 12, 2016. The system was offline for approximately 13 hours. RW-2 was offline for approximately 44 hours.
- (16) The system shut down at 12:59 pm on June 20, 2016 due to a low flow alarm at the RW-2 influent manifold. The alarm was cleared and the system was restarted at 4:30 pm on the same day. The system was offline for approximately 3.5 hours.
- (17) The system shut down at 4:15 pm on June 22, 2016 due to an air stripper high pressure alarm. The alarm was cleared and the system was restarted at 5:20 pm on the same day. The system was offline for approximately 1 hour.
- (18) RW-2 was shut down at 9:00 am on June 29, 2016 to install a new pump in RW-2. RW-2 was restarted at 1:15 pm on the same day and was offline for approximately 3 hours.

Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

Third Quarter 2016

- (19) The system shut down at 8:33 pm on July 2, 2016 due to overvoltage from the power supply. The alarm was cleared and the system was restarted at 9:30 pm on the same day. The system was offline for approximately 1 hour.
- (20) The system shut down at 10:27 am on July 5, 2016 due to a building high sump level alarm. The sump was emptied, the alarm was cleared and the system was restarted at 11:15 am on the same day. The system was offline for approximately 1 hour.
- (21) The system shut down at 1:13 pm on July 23, 2016 due to an air stripper high pressure alarm from a faulty pressure switch. The switch was replaced, the alarm was cleared and the system was restarted at 8:57 am on July 25, 2016. The system was offline for approximately 44 hours.
- (22) The system shut down at 2:05 pm on August 10, 2016 due to an air stripper high pressure alarm. The alarm was cleared and the system was restarted at 2:30 pm on the same day. The system was offline for approximately 0.5 hours.
- (23) The system shut down at 7:30 pm on September 11, 2016 due to an air stripper low influent flow alarm. The system was restarted without RW-2 around 9:30 am on September 12, 2016. The system was offline for approximately 14 hours. A new pump was installed in RW-2 on September 12, 2016 and was brought online at 12:30 pm on the same day. RW-2 was offline for approximately 17 hours.
- (24) The system shut down at 9:50 am on September 22, 2016 due to an air stripper high pressure alarm. The alarm was reset and the system was restarted at 12:30 pm on the same day. The system was offline for approximately 2 hours.
- (25) The system shut down at 1:44 pm on September 23, 2016 due to an air stripper high pressure alarm. The alarm was reset and the system was restarted at 5:59 pm on the same day. The system was offline for approximately 4.25 hours.

Fourth Quarter 2016

- (26) The system shut down at 1:26 pm on October 6, 2016 due to an air stripper high pressure alarm. The alarm was reset and the system was restarted at 4:15 pm on the same day. The system was offline for approximately 3 hours.
- (27) The system was shut down at 7:50 am on October 12, 2016 for pipe modification work done to RW-2 and RW-3 to modify existing cleanouts and install additional pipe cleanouts. The system was restarted at 4:35 pm on October 20, 2016. The system was offline for approximately 9 days.
- (28) The system shut down at 7:43 am on October 21, 2016 due to an air stripper high pressure alarm. The alarm was reset and the system was restarted at 9:34 am on the same day. The system was offline for approximately 2 hours.
- (29) The system was shut down at approximately 8:00 am on October 31, 2016 to clean the influent pipelines for RW-2 and RW-3. The system was restarted at 4:06 pm on November 3, 2016. The system was offline for approximately 3 days.
- (30) The system shut down at 1:48 pm on December 18, 2016 due to a low pressure alarm at the RW-2 influent manifold. The setpoint was adjusted, the alarm was reset, and the system was restarted at 9:07 am on December 19, 2016. The system was offline for approximately 19 hours.
- (31) The system shut down at 4:31 pm on December 29, 2016 due to an air stripper low air flow alarm. The air stripper blower variable frequency drive (VFD) frequency was adjusted, the alarm was reset, and the system was restarted at 9:08 pm on the same day. The system was offline for approximately 5 hours.

Table 2
Summary of Influent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York.

Compound	10/04/10 (µg/L)	11/08/10 (µg/L)	4/1/2016 ⁽³⁾ (µg/L)	06/10/16 (µg/L)	08/23/16 (µg/L)	12/16/16 (µg/L)
Project VOCs						
1,1,1 - Trichloroethane	ND	ND	< 1.0	< 1.0	< 1.0	< 1.0
1,1 - Dichloroethane	0.75	0.80	0.55 J	0.39 J	< 1.0	0.31 J
1,2 - Dichloroethane	ND	ND	< 1.0	< 1.0	< 1.0	< 1.0
1,1 - Dichloroethene	0.80	0.88	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	ND	ND	< 1.0	0.30 J	0.25 J	< 1.0
Trichloroethene	14	15	3.7	4.0	3.3	3.9
Vinyl Chloride	13	12	29	16	11	13
cis 1,2-Dichloroethene	92	91	18	12	8.0	7.7
trans 1,2-Dichloroethene	ND	0.98	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	ND	ND	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	6.6	5.9	9.1	6.1	4.5	2.5
Xylene-O	ND	ND	0.52 J	0.31 J	0.22 J	< 1.0
Xylenes - M,P			0.66 J	0.54 J	< 1.0	< 1.0
Subtotal Project VOCs	127	127	61	40	27	27
Compound	10/04/10 (µg/L)	11/08/10 (µg/L)	4/1/2016 ⁽³⁾ (µg/L)	06/10/16 (µg/L)	08/23/16 (µg/L)	12/16/16 (µg/L)
Non-Project VOCs						
1,1,2,2-Tetrachloroethane			< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane			< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone			< 10	< 10	< 10	< 10
4-Methyl-2-Pentanone			< 5.0	< 5.0	< 5.0	< 5.0
Acetone			< 10	< 10	< 10	< 10
Bromodichloromethane			< 1.0	< 1.0	< 1.0	< 1.0
Bromoform			< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane			< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide			< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride			< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene			< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane			< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)			3.9 J	4.2 J	3.0 J	2.1 J
Chloroethane			< 1.0	< 1.0	< 1.0	< 1.0
Chloroform			2.4	1.8	1.5	1.3
Chloromethane			< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene			< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)			< 2.0	< 2.0	< 2.0	< 2.0
Dichloromethane			< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene			0.98 J	0.62 J	0.38 J	0.31 J
Methyl N-Butyl Ketone			< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether			< 1.0	< 1.0	< 1.0	< 1.0
Styrene (Monomer)			< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene			< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane (Freon 11)			< 2.0	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)			< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs	330	350	7.3	6.6	4.9	3.7
Total VOCs⁽¹⁾	457	477	68	46	32	31
1,4-Dioxane⁽⁴⁾			0.62	0.47	0.28	0.97

Notes and abbreviations on last page.

Table 2
Summary of Influent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York.

Compound Vapor samples collected by	10/04/10 (µg/L)	11/08/10 (µg/L)	4/1/2016 ⁽³⁾ (µg/L)	06/10/16 (µg/L)	08/23/16 (µg/L)	12/16/16 (µg/L)
Inorganics						
Dissolved Cadmium			--	--	--	< 3.0
Total Cadmium			--	--	--	< 3.0
Dissolved Chromium			--	--	--	11
Total Chromium			--	--	--	20
Dissolved Iron			317	220	169	240
Total Iron	1,180	2,000	606	328	2,640	3,140
Total Mercury	NA	NA	--	--	--	--
pH⁽²⁾	7	6	5.9	5.8	5.6	5.7

Notes and Abbreviations:

- (1) "Total VOCs" represents the sum of individual concentrations of the compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
- (2) Influent pH samples collected and measured in the field by Arcadis personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.
- (3) First Quarter samples were collected on April 1, 2016 due to RW-2 downtime in March.
- (4) Samples collected during First through Third Quarters 2016 were analyzed for 1,4-Dioxane using USEPA Method 8270D SIM. Samples collected during Fourth Quarter 2016 were analyzed for 1,4-Dioxane using USEPA Method 522.

- 700** Bold value indicates a detection.
 -- not analyzed
 J Compound detected below its reporting limit; value is estimated.
 USEPA United States Environmental Protection Agency
 VOC volatile organic compound
 µg/L micrograms per liter
 < 5 Compound not detected above its laboratory quantification limit.

Table 3
Summary of Effluent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Discharge Limit ⁽¹⁾ (µg/L)	2/1/2016 ⁽⁵⁾ (µg/L)	02/23/16 (µg/L)	4/1/2016 ⁽⁶⁾ (µg/L)	04/18/16 (µg/L)	05/18/16 (µg/L)	06/10/16 (µg/L)	07/14/16 (µg/L)	08/23/16 (µg/L)	09/14/16 (µg/L)	10/11/16 (µg/L)	11/28/16 (µg/L)	12/16/16 (µg/L)
Project VOCs													
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.30 J	< 1.0	< 1.0	< 1.0
Vinyl Chloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans 1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-O	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - M,P	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Subtotal Project VOCs	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.30	0.0	0.0	0.0

Notes and abbreviations on last page.

Table 3
Summary of Effluent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Discharge Limit ⁽¹⁾ (µg/L)	2/1/2016 ⁽⁵⁾ (µg/L)	02/23/16 (µg/L)	4/1/2016 ⁽⁶⁾ (µg/L)	04/18/16 (µg/L)	05/18/16 (µg/L)	06/10/16 (µg/L)	07/14/16 (µg/L)	08/23/16 (µg/L)	09/14/16 (µg/L)	10/11/16 (µg/L)	11/28/16 (µg/L)	12/16/16 (µg/L)
Non-Project VOCs													
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	0.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10 J
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichloromethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane (Freon 11)	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total VOCs ⁽²⁾	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.30	0.0	0.0	0.0
Treatment Efficiency ⁽³⁾	--	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	99.1%	> 99.9%	> 99.9%	> 99.9%

Notes and abbreviations on last page.

Table 3
Summary of Effluent Water Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Discharge Limit ⁽¹⁾ (µg/L)	2/1/2016 ⁽⁵⁾ (µg/L)	02/23/16 (µg/L)	4/1/2016 ⁽⁶⁾ (µg/L)	04/18/16 (µg/L)	05/18/16 (µg/L)	06/10/16 (µg/L)	07/14/16 (µg/L)	08/23/16 (µg/L)	09/14/16 (µg/L)	10/11/16 (µg/L)	11/28/16 (µg/L)	12/16/16 (µg/L)
<u>Inorganics</u>													
Dissolved Cadmium	5	--	--	< 3.0	--	--	< 3.0	--	< 3.0	--	--	--	< 3.0
Total Cadmium	5	--	--	< 3.0	--	--	< 3.0	--	< 3.0	--	--	--	< 3.0
Dissolved Chromium	50	--	--	< 10	--	--	< 10	--	< 10	--	--	--	< 10
Total Chromium	50	--	--	< 10	--	--	< 10	--	< 10	--	--	--	< 10
Dissolved Iron	600	156	216	281	195	202	205	199	162	270	201	262	224
Total Iron	600	226	262	490	228	229	266	241	208	304	205	280	622⁽⁹⁾
Total Mercury	250	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
1,4-Dioxane ⁽⁸⁾	--	0.24	0.53	0.56	0.61	< 0.11	0.53	0.41	0.40	0.60	1.32	1.25	1.0
pH ⁽⁴⁾	5.5 - 8.5	5.9	6.8	7.0	6.8	6.7	6.9	-- ⁽⁷⁾	6.4	6.6	6.7	-- ⁽⁷⁾	6.8

Notes and Abbreviations:

- (1) Discharge limits per the interim SPDES equivalency program or Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Quality Standards and Guidance Values and Groundwater Effluent Limitations, if the compound is not part of the interim SPDES equivalency program.
- (2) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
- (3) Treatment efficiency was calculated by dividing the difference between the influent and effluent total VOC concentrations by the influent total VOC concentration.
- (4) Effluent pH samples collected and measured in the field by Arcadis personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.
- (5) Samples representing the month of January were collected on February 1, 2016 due to RW-2 downtime in January.
- (6) Samples representing the month of March were collected on April 1, 2016 due to RW-2 downtime in March.
- (7) July and November 2016 pHs not recorded due to technician error.
- (8) Samples collected during First through Third Quarters 2016 were analyzed for 1,4-Dioxane using USEPA Method 8270D SIM. Samples collected during Fourth Quarter 2016 were analyzed for 1,4-Dioxane using USEPA Method 522.
- (9) The December 16, 2016 iron concentration exceeded its discharge limit of 600 µg/l. The exceedance is believed to be the result of iron precipitates in the sample tap.

- 700** Bold value indicates a detection.
- J Compound detected below its reporting limit; value is estimated.
- SPDES State Pollutant Discharge Elimination System
- USEPA United States Environmental Protection Agency
- VOC volatile organic compound
- µg/L micrograms per liter
- not analyzed
- < 5 Compound not detected above its laboratory quantification limit.

Table 4
Influent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York. ⁽¹⁾

Compound	04/01/16 (µg/m ³)	06/10/16 (µg/m ³)	08/23/16 (µg/m ³)	12/22/16 (µg/m ³)
Project VOCs				
1,1,1 - Trichloroethane	0.87	0.71	0.60	< 1.1
1,1 - Dichloroethane	7.7	4.9	4.5	4.5
1,2 - Dichloroethane	< 0.81	0.45 J	< 0.81	< 1.6
1,1 - Dichloroethene	2.5	1.5	1.5	1.9
Tetrachloroethene	3.2	3.5	3.1	142
Trichloroethene	45	53	47	58
Vinyl Chloride	458	184	180	143
cis 1,2-Dichloroethene	272	165	155	119
trans 1,2-Dichloroethene	0.67 J	0.44 J	0.35 J	< 1.6
Benzene	1.3	1.5	0.70	1.5
Toluene	139	90	77	37
Xylene-O	10	4.3	3.6	2.3
Xylenes - M,P	14	7.8	6.1	5.6
Subtotal Project VOCs	954	517	479	515
Compound	04/01/16 (µg/m ³)	06/10/16 (µg/m ³)	08/23/16 (µg/m ³)	12/22/16 (µg/m ³)
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69	< 0.69	< 0.69	< 1.4
1,1,2-Trichloroethane	< 0.55	< 0.55	< 0.55	< 1.1
1,2-Dichloropropane	< 0.92	0.60 J	< 0.92	< 1.8
1,3-Butadiene	<0.44	<0.44	< 0.44	< 0.88
2-Butanone	2.6	0.88	1.1	3.2
4-Methyl-2-Pentanone	< 0.82	< 0.82	< 0.82	< 1.6
Acetone	9.3	< 0.48	7.1	19
Bromodichloromethane	< 0.67	< 0.67	< 0.67	< 1.3
Bromoform	< 0.41	< 0.41	< 0.41	< 0.83
Bromomethane	< 0.78	< 0.78	< 0.78	< 1.6
Carbon Disulfide	< 0.62	< 0.62	< 0.62	11
Carbon Tetrachloride	< 0.25	< 0.25	< 0.25	< 0.50
Chlorobenzene	< 0.92	< 0.92	< 0.92	< 1.8
Chlorodibromomethane	< 0.85	< 0.85	< 0.85	< 1.7
Chlorodifluoromethane (Freon 22)	46	28	35	26
Chloroethane	< 0.53	< 0.53	< 0.53	< 1.1
Chloroform	34	22	21	19
Chloromethane	1.8	1.2	1.3	1.4
cis-1,3-Dichloropropene	< 0.91	< 0.91	< 0.91	< 1.8
Dichlorodifluoromethane (Freon 12)	2.8	2.3	2.7	2.1
Dichloromethane	1.9	2.5	3.4	1.8
Ethylbenzene	15	9.6	6.1	5.2
Methyl N-Butyl Ketone	< 0.82	< 0.82	< 0.82	< 1.6
Methyl-Tert-Butylether	4.0	< 0.72	0.65 J	< 1.4
Styrene (Monomer)	< 0.85	< 0.85	< 0.85	< 1.7
trans-1,3-Dichloropropene	< 0.91	< 0.91	< 0.91	< 1.8
Trichlorofluoromethane (Freon 11)	1.6	1.6	2.1	1.5
Trichlorotrifluoroethane (Freon 113)	2.5	2.2	2.1	2.1
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82	< 0.82	< 0.82	< 1.6
Subtotal Non-Project VOCs	122	71	83	92
Total VOCs ⁽²⁾	1076	588	562	607

Notes and abbreviations on last page.

Table 4
Influent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York. ⁽¹⁾

Notes and Abbreviations:

- (1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.
- (2) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

700	Bold value indicates a detection.
ELAP	Environmental Laboratory Approval Program
IRM	interim remedial measure
J	Compound detected below its reporting limit; value is estimated.
ND	Analyte not detected at or above its laboratory reporting limit.
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
SPDES	State Pollutant Discharge Elimination System
TIC	tentatively identified compound
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
< 5	Compound not detected above its laboratory quantification limit.

Table 5
Summary of Effluent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ⁽¹⁾

Compound	04/01/16 (µg/m ³)	06/10/16 (µg/m ³)	08/23/16 (µg/m ³)	12/22/16 (µg/m ³)
Project VOCs				
1,1,1 - Trichloroethane	< 0.55	< 0.55	< 0.55	< 0.55
1,1 - Dichloroethane	7.7	4.0	6.1	4.5
1,2 - Dichloroethane	< 0.81	< 0.81	< 0.81	< 0.81
1,1 - Dichloroethene	0.83	0.48 J	0.63 J	0.83
Tetrachloroethene	0.68	2.0	0.29	0.64
Trichloroethene	7.5	1.7	1.1	2.7
Vinyl Chloride	3.3	2.8	3.6	17
cis 1,2-Dichloroethene	11	7.1	11	40
trans 1,2-Dichloroethene	< 0.79	< 0.79	< 0.79	< 0.79
Benzene	5.8	3.1	3.2	6.4
Toluene	14	9.0	8.7	4.1
Xylene-O	0.69 J	0.56 J	< 0.87	0.69 J
Xylenes - M,P	1.8	1.5	0.52 J	2.5
Subtotal Project VOCs	53	32	35	79
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69	< 0.69	< 0.69	< 0.69
1,1,2-Trichloroethane	< 0.55	< 0.55	< 0.55	< 0.55
1,2-Dichloropropane	< 0.92	< 0.92	< 0.92	< 0.92
1,3-Butadiene	< 0.44	< 0.44	< 0.44	< 0.44
2-Butanone	9.1	6.2	2.5	8.8
4-Methyl-2-Pentanone	< 0.82	< 0.82	< 0.82	< 0.82
Acetone	87	107	51	143
Bromodichloromethane	< 0.67	< 0.67	< 0.67	< 0.67
Bromoform	< 0.41	< 0.41	< 0.41	< 0.41
Bromomethane	< 0.78	< 0.78	< 0.78	< 0.78
Carbon Disulfide	< 0.62	< 0.62	< 0.62	0.75
Carbon Tetrachloride	< 0.25	< 0.25	< 0.25	< 0.25
Chlorobenzene	< 0.92	< 0.92	< 0.92	< 0.92
Chlorodibromomethane	< 0.85	< 0.85	< 0.85	< 0.85
Chlorodifluoromethane (Freon 22)	46	23	40	21
Chloroethane	< 0.53	< 0.53	< 0.53	< 0.53
Chloroform	42	32	40	24
Chloromethane	10	2.9	6.0	2.0
cis-1,3-Dichloropropene	< 0.91	< 0.91	< 0.91	< 0.91
Dichlorodifluoromethane (Freon 12)	2.8	2.6	2.6	2.1
Dichloromethane	1.4	9.0	0.73	10
Ethylbenzene	1.4	0.56 J	< 0.87	0.96
Methyl N-Butyl Ketone	< 0.82	< 0.82	< 0.82	< 0.82
Methyl-Tert-Butylether	< 0.72	< 0.72	< 0.72	< 0.72
Styrene (Monomer)	< 0.85	< 0.85	< 0.85	< 0.85
trans-1,3-Dichloropropene	< 0.91	< 0.91	< 0.91	< 0.91
Trichlorofluoromethane (Freon 11)	1.9	2.9	1.7	1.7
Trichlorotrifluoroethane (Freon 113)	< 0.77	< 0.77	0.74 J	1.4
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82	< 0.82	< 0.82	< 0.82
Subtotal Non-Project VOCs	201	186	146	216
Total VOCs ⁽²⁾	255	218	181	295

Notes and abbreviations on last page.

Table 5
Summary of Effluent Vapor Sample Analytical Results,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. ⁽¹⁾

Notes and Abbreviations:

- (1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.
- (2) "Total VOCs" represents the sum of individual concentrations of all compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

700 Bold data indicates that the analyte was detected at or above its reporting limit.

< 5 Compound not detected above its laboratory quantification limit.

ELAP Environmental Laboratory Approval Program

J Compound detected below its reporting limit; value is estimated.

NYSDOH New York State Department of Health

OM&M operation, maintenance, and monitoring

USEPA United States Environmental Protection Agency

VOC volatile organic compound

$\mu\text{g}/\text{m}^3$ micrograms per cubic meter

Table 6
Summary of Effluent Vapor Tentatively Identified Compounds,
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York. ⁽¹⁾

Compound	04/01/16 (ppbv)	06/10/16 (ppbv)	08/23/16 (ppbv)	12/16/16 (ppbv)
<u>Tentatively Identified Compounds</u>				
2,6-Dimethylundecane	--	--	--	--
2-butyl-1,1,3-trimethyl-cyclohexane	--	--	--	--
2-Methylundecane	--	--	--	--
2-Phenyl-2-propanol	--	2.2 JN	--	--
3-Methylundecane	--	--	--	--
4-Methylundecane	--	--	--	--
Acetaldehyde	--	15 JN	--	--
Acetophenone	--	6.8 JN	--	--
alkane	6.4 J	6.7 J	3.1 J	6.1 J
alkane	6.3 J	2.0 J	2.9 J	3.6 J
alkane	5.4 J	1.8 J	2.3 J	3.5 J
alkane	4.5 J	1.4 J	2.1 J	2.9 J
alkane	3.7 J	--	1.9 J	2.7 J
alkane	3.3 J	--	1.8 J	2.7 J
alkane	3.2 J	--	1.4 J	--
alkane	3.1 J	--	--	--
alkene	--	--	--	--
cycloalkane/alkene	--	1.5 J	2.6 J	7.1 J
cycloalkane/alkene	--	--	--	3.7 J
cycloalkane/alkene	--	--	--	3.4 J
cycloalkane/alkene	--	--	--	3.2 J
cycloalkane/alkene	--	--	--	1.3 J
cycloalkane/alkene	--	--	--	1.2 J
Ethylene Oxide	--	190 JNB	--	--
Methylcyclohexane	3.0 JN	--	--	--
Methylcyclopentane	4.9 JN	--	--	--
Naphthalene decahydro-methyl	--	--	--	5.8 J
Naphthalene decahydro-methyl	--	--	--	4.2 J
Naphthalene decahydro-methyl- isomer	5.5 J	--	--	--
N-Undecane	4.3 JN	--	--	--
Pentane	3.1 JN	--	--	--
Pentyl-Cyclohexane	4.7 JN	--	--	--
Unknown	5.8 J	1.9 J	--	3.5 J
Unknown	4.5 J	--	--	2.0 J
Unknown	3.6 J	--	--	1.5 J
Unknown	2.9 J	--	--	--
UNKNOWN VOA ALKENE1	--	--	--	--
UNKNOWN VOA ALKENE2	--	--	--	--
UNKNOWN VOA ALKENE3	--	--	--	--
Total VOC TICs	78	39	22	58

Notes and abbreviations on last page.

Table 6
Summary of Effluent Vapor Tentatively Identified Compounds,
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York. ⁽¹⁾

Notes and Abbreviations:

(1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.

700 Bold data indicates that the analyte was detected at or above its reporting limit.

ELAP Environmental Laboratory Approval Program

J Compound detected below its reporting limit; value is estimated.

B Compound was also detected in the associated field blank.

IRM interim remedial measure

N Indicates presumptive evidence of a compound.

NYSDOH New York State Department of Health

OM&M operation, maintenance, and monitoring

USEPA United States Environmental Protection Agency

VOC volatile organic compound

ppbv parts per billion by volume

Table 7
Summary of System Parameters,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Date ⁽¹⁾	Water Flow Rates						Water Pressures ⁽²⁾					Air Flow Rate ⁽²⁾	Air Pressures ⁽⁵⁾					Air Temp. ⁽⁵⁾
	Remedial Well ⁽²⁾				Combined Influent ⁽³⁾	Effluent ⁽²⁾	Remedial Well Effluent ⁽⁴⁾				Effluent	Effluent	EC Inflents				Effluent	Effluent
	RW-1	RW-2	RW-3	RW-4			RW-1	RW-2	RW-3	RW-4			GAC-501	GAC-502	PPZ-601	PPZ-602		
	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(psi)	(psi)	(psi)	(psi)	(psi)	(scfm)	(iwc)	(iwc)	(iwc)	(iwc)	(iwc)	(°R)
02/01/16	30.2	75.6	74.8	30.0	211	214	56	33	24	55	17	1,880	6.9 ⁽⁸⁾	3.2 ⁽⁸⁾	2.1 ⁽⁸⁾	2.5 ⁽⁸⁾	0.0 ⁽⁸⁾	535 ⁽⁸⁾
02/23/16	30.5	74.9	75.7	29.6	211	216	56	32	18	56	11	1,961	6.9 ⁽⁹⁾	3.2 ⁽⁹⁾	2.0 ⁽⁹⁾	2.0 ⁽⁹⁾	0.0 ⁽⁹⁾	526 ⁽⁹⁾
04/01/16	30.8	78.4	75.2	30.0	214	227	56	23	17	55	13	1,891	6.5 ⁽¹⁰⁾	3.0 ⁽¹⁰⁾	1.0 ⁽¹⁰⁾	2.0 ⁽¹⁰⁾	0.0 ⁽¹⁰⁾	528 ⁽¹⁰⁾
04/18/16	30.9	75.8	75.7	29.9	212	216	55	30	14	55	11	1,814	5.8	3.4	0.5	2.0	0.0	532
05/18/16	29.9	75.4	75.7	30.2	211	224	56	22	20	55	12	1,973	6.5 ⁽¹¹⁾	3.4 ⁽¹¹⁾	1.0 ⁽¹¹⁾	2.0 ⁽¹¹⁾	2.0 ⁽¹¹⁾	532 ⁽¹¹⁾
06/10/16	30.2	73.7	75.2	30.3	209	211	56	11	22	54	11	1,827	7.0 ⁽¹²⁾	3.5 ⁽¹²⁾	1.0 ⁽¹²⁾	2.2 ⁽¹²⁾	0.0 ⁽¹²⁾	537 ⁽¹²⁾
07/14/16	30.3	75.1	75.0	30.8	211	222	55	13	25	54	12	1,816	6.9 ⁽¹³⁾	3.4 ⁽¹³⁾	1.0 ⁽¹³⁾	2.0 ⁽¹³⁾	0.0 ⁽¹³⁾	538 ⁽¹³⁾
08/23/16	30.1	62.7	75.3	29.8	198	203	55	6	21	54	12	1,840	6.5 ⁽¹⁴⁾	3.2 ⁽¹⁴⁾	1.0 ⁽¹⁴⁾	2.0 ⁽¹⁴⁾	0.0 ⁽¹⁴⁾	540 ⁽¹⁴⁾
09/14/16	30.7	74.7	75.1	30.8	211	221	54	6	19	53	11	1,738	6.0 ⁽¹⁵⁾	3.0 ⁽¹⁵⁾	1.0 ⁽¹⁵⁾	2.0 ⁽¹⁵⁾	0.0 ⁽¹⁵⁾	539 ⁽¹⁵⁾
10/11/16	30.0	72.9	74.4	30.9	208	233	55	9	20	53	13	1,689	6.4	3.2	1.0	2.0	0.0	538
11/28/16	30.8	75.9	75.2	29.9	212	226	54	50	43	54	13	1,719	6.5	3.2	1.0	2.0	0.0	532
12/16/16	30.0	74.6	74.8	29.8	209	229	55	46	40	53	12	1,736	6.5 ⁽¹⁶⁾	3.0 ⁽¹⁶⁾	1.0 ⁽¹⁶⁾	1.9 ⁽¹⁶⁾	0.0 ⁽¹⁶⁾	519 ⁽¹⁶⁾

Notes and abbreviations on last page.

Table 7
Summary of System Parameters,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

- (1) Operational data collected by Arcadis on days noted. Parameters listed were typically recorded during compliance monitoring events. Data in this table correspond to approximately the past year of system operation.
- (2) Instantaneous parameters obtained from the SCADA HMI: Water Flow Rate, Water Pressure, Air Flow Rate.
- (3) Combined influent water-flow rate is the sum of individual well flow rates via the SCADA System.
- (4) Remedial Well effluent pressure readings measured at the influent manifold within the treatment system building.
- (5) Instantaneous values from field-mounted instruments
- (6) Values collected on October 12, 2015 during the weekly site visit. No values collected on day of sampling.
- (7) Values collected on December 23, 2015 during the weekly site visit. No values collected on day of sampling.
- (8) Values collected on February 2, 2016 during the weekly site visit. No values collected on day of sampling.
- (9) Values collected on February 22, 2016 during the weekly site visit. No values collected on day of sampling.
- (10) Values collected on April 5, 2016 during the weekly site visit. No values collected on day of sampling.
- (11) Values collected on May 16, 2016 during the weekly site visit. No values collected on day of sampling.
- (12) Values collected on June 6, 2016 during the weekly site visit. No values collected on day of sampling.
- (13) Values collected on July 11, 2016 during the weekly site visit. No values collected on day of sampling.
- (14) Values collected on August 22, 2016 during the weekly site visit. No values collected on day of sampling.
- (15) Values collected on September 13, 2016 during the weekly site visit. No values collected on day of sampling.
- (16) Values collected on December 19, 2016 during the weekly site visit. No values collected on day of sampling.

ECU	emission control unit
gpm	gallons per minute
HMI	Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided.
iwc	inches of water column
psi	pounds per square inch
°R	"Total VOCs" represents the sum of individual concentrations of all compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
SCADA	Supervisory Control and Data Acquisition
scfm	standard cubic feet per minute
Temp.	temperature

Table 9
Summary of Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3, Bethpage, New York.

Toxic Air Contaminant	CAS#	VSP-05 Vapor Effluent (ug/m ³)	Emission Rate ⁽¹⁾			Scaled Impact - Hourly ⁽²⁾ (ug/m ³)	Scaled Impact - Annual ⁽²⁾ (ug/m ³)	SGC ⁽³⁾ (ug/m ³)	AGC ⁽³⁾ (ug/m ³)	% of SGC	% of AGC
		12/22/2016	lb/yr	lb/hr	g/s						
1,1 - Dichloroethane	00075-34-3	4.5	0.26	3.01E-05	3.79E-06	1.19E-02	3.66E-04	--	0.63	--	0.1%
1,1 - Dichloroethene	00075-35-4	0.83	0.05	5.55E-06	6.99E-07	2.20E-03	6.74E-05	--	200	--	0.0%
Tetrachloroethene	00127-18-4	0.64	0.04	4.28E-06	5.39E-07	1.70E-03	5.20E-05	300	4	0.0%	0.0%
Trichloroethene	00079-01-6	2.7	0.16	1.80E-05	2.27E-06	7.17E-03	2.19E-04	20	0.20	0.0%	0.1%
Vinyl Chloride	00075-01-4	17	1.00	1.14E-04	1.43E-05	4.51E-02	1.38E-03	180,000	0.11	0.0%	1.3%
cis 1,2-Dichloroethene	00156 59 2	40	2.34	2.67E-04	3.37E-05	1.06E-01	3.25E-03	--	63	--	0.0%
Benzene	00071-43-2	6.4	0.37	4.28E-05	5.39E-06	1.70E-02	5.20E-04	1,300	0.13	0.0%	0.4%
Toluene	00108-88-3	4.1	0.24	2.74E-05	3.45E-06	1.09E-02	3.33E-04	37,000	5,000	0.0%	0.0%
Xylene-O	01330-20-7	0.69	0.04	4.61E-06	5.81E-07	1.83E-03	5.61E-05	22,000	100	0.0%	0.0%
Xylenes - M,P	01330-20-7	2.5	0.15	1.67E-05	2.11E-06	6.64E-03	2.03E-04	22,000	100	0.0%	0.0%
2-Butanone	00078 93 3	8.8	0.52	5.88E-05	7.41E-06	2.34E-02	7.15E-04	13,000	5,000	0.0%	0.0%
Acetone	00067 64 1	143	8.37	9.56E-04	1.20E-04	3.80E-01	1.16E-02	180,000	30,000	0.0%	0.0%
Carbon Disulfide	00075 15 0	0.75	0.04	5.01E-06	6.32E-07	1.99E-03	6.09E-05	6,200	700	0.0%	0.0%
Chlorodifluoromethane (Freon 22)	00075 45 6	21	1.23	1.40E-04	1.77E-05	5.58E-02	1.71E-03	--	50,000	--	0.0%
Chloroform	00067-66-3	24	1.41	1.60E-04	2.02E-05	6.37E-02	1.95E-03	150	14.7	0.0%	0.0%
Chloromethane	00074 87 3	2.0	0.12	1.34E-05	1.68E-06	5.31E-03	1.62E-04	22,000	90	0.0%	0.0%
Dichlorodifluoromethane (Freon 12)	00075 71 8	2.1	0.12	1.40E-05	1.77E-06	5.58E-03	1.71E-04	--	12,000	--	0.0%
Dichloromethane	00075 09 2	10	0.59	6.68E-05	8.42E-06	2.65E-02	8.12E-04	14,000	60	0.0%	0.0%
Ethylbenzene	00100 41 4	0.96	0.06	6.42E-06	8.08E-07	2.55E-03	7.80E-05	--	1,000	--	0.0%
Trichlorofluoromethane (Freon 11)	00075 69 4	1.7	0.10	1.14E-05	1.43E-06	4.51E-03	1.38E-04	9,000	5,000	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	00076-13-1	1.4	0.08	9.36E-06	1.18E-06	3.72E-03	1.14E-04	960,000	180,000	0.0%	0.0%

Notes and abbreviations on last page.

Table 9
Summary of Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3, Bethpage, New York.

Notes

(1) Emission rate calculated based on an exit air flow rate of 1,772 cfm

$$1,1,1\text{-Trichloroethane (lb/hr)} = (0.87 \text{ ug/m}^3) \times (1,772 \text{ ft}^3/\text{min}) \times (1 \text{ m}^3/35 \text{ ft}^3) \times (60 \text{ min/hr}) \times (0.000001 \text{ g/1 ug}) \times (0.0022 \text{ lb/g})$$

$$\text{lb/yr} = \text{lb/hr} \times 8,760 \text{ hrs/yr}$$

$$\text{g/s} = \text{lb/hr} \times \text{hr}/3,600 \text{ sec} \times 453.59 \text{ g/lb}$$

(2) Ambient impact based on AERMOD modeling using normalized rate of 1 g/s is scaled to the actual emission rate of the pollutant. Modeling was performed using the representative meteorological data from the nearest station (Brookhaven/Farmingdale) for the years 2011 through 2015. The maximum impact from all the years was used for the calculations.

$$\text{Scaled hourly impact (ug/m}^3) = \text{AERMOD predicted hourly ambient impact at 1 g/s (ug/m}^3\text{/[g/s])} \times \text{Actual emission rate (g/s)}$$

$$\text{Scaled annual impact (ug/m}^3) = \text{AERMOD predicted annual ambient impact at 1 g/s (ug/m}^3\text{/[g/s])} \times \text{Actual emission rate}$$

AERMOD Normalized Ambient Impact at 1 g/s	
Hourly (ug/m ³ /[g/s])	Annual (ug/m ³ /[g/s])
3,153.03	96.49

(3) Short-term and annual guideline concentrations specified in the NYSDEC DAR-1 AGC/SGC tables revised August 10, 2016.

Table 10
Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells,
Bethpage Park Groundwater Containment System, Operable Unit 3, (Former Grumman Settling Ponds)
Bethpage, New York.

COMPOUND (µg/L)	NYSDE C SCGs	Sample Location: Sample Date:	RW-1 4/1/2016	RW-1 6/10/2016	RW-1 8/23/2016	RW-1 12/16/2016	RW-2 4/1/2016	RW-2 6/10/2016	RW-2 8/23/2016	RW-2 12/16/2016	RW-3 4/1/2016	RW-3 6/10/2016	RW-3 8/23/2016	RW-3 12/16/2016	RW-4 4/1/2016	RW-4 6/10/2016	RW-4 8/23/2016	RW-4 12/16/2016
1,1,1-Trichloroethane	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5.00		< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.1	0.86 J	0.80 J	< 1.0	< 1.0	< 1.0	< 1.0	0.28 J	0.30 J	0.28 J	0.31 J
1,1-Dichloroethene	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.35 J	0.23 J	0.21 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone	50		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	1		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	4.9 J	< 5.0	4.0 J	3.2 J	17	17	14	12
Chloroethane	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7		< 1.0	< 1.0	< 1.0	< 1.0	4.2	3.2	2.9	2.6	3.1	2.5	2.1	1.8	0.26 J	< 1.0	0.28 J	0.29 J
Chloromethane	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene	5		< 1.0	< 1.0	< 1.0	< 1.0	53	40	35	27	2.2	1.8	1.5	2.1	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene	0.4		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichloromethane	5		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5		< 1.0	< 1.0	< 1.0	< 1.0	2.8	2.3	1.7	1.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone	50		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl tert-Butyl Ether	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.25 J	0.26 J	< 1.0	0.64 J	0.49 J	0.65 J	0.53 J
Toluene	5		< 1.0	< 1.0	< 1.0	< 1.0	28	22	20	9.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.44 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene	0.4		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene	5		< 1.0	< 1.0	< 1.0	< 1.0	8.6	11	11	12	2.6	2.2	1.9	2.4	0.72 J	0.57 J	0.59 J	0.51 J
Trichlorofluoromethane (Freon 11)	5		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	5		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2		< 1.0	< 1.0	< 1.0	< 1.0	87	59	50	39	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o	5		< 1.0	< 1.0	< 1.0	< 1.0	1.5	1.1	0.93 J	0.40 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p	5		< 1.0	< 1.0	< 1.0	< 1.0	1.9	1.9	1.5	0.69 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs⁽²⁾			0	0	0	0	187	143	123	93	13	6.8	9.8	9.5	19	18	16	13
Project VOCs⁽³⁾			0	0	0	0	180	137	119	89	4.8	4.3	3.7	4.5	1.6	1.4	1.5	1.4
1,4-Dioxane			0.44	0.35	0.30	0.77	1.5	1.2	1.1	1.7	0.31	0.22	0.18	0.66	< 0.11 U	< 0.11 U	< 0.10 U	2.84

Notes and abbreviations on last page.

Table 10
Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells,
Bethpage Park Groundwater Containment System, Operable Unit 3, (Former Grumman Settling Ponds)
Bethpage, New York.

Notes and Abbreviations:

- (1) Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3 (prior to September 1, 2014) and per USEPA Method 8260C (after September 1, 2014). Results validated following protocols specified in Sampling and Analysis Plan in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous quarterly reports for historical analytical results.
- (2) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.
- (3) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m, and p.

	Indicates an exceedance of an SCG.
700	Bold data indicates a detection.
ASP	analytical services protocol
ELAP	Environmental Laboratory Approval Program
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
SCGs	standards, criteria, and guidance values
VOC	volatile organic compound
µg/L	micrograms per liter
—	not analyzed
NE	not established
J	Compound detected below its reporting limit; value is estimated.
< 5	Compound not detected above its laboratory quantification limit.

Table 11
Concentrations of Metals in Groundwater Samples
Collected from Remedial Wells, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York. ^(1,2)

COMPOUND (µg/L)	NYSDEC SCGs	RW-1 12/16/2016	RW-2 12/16/2016	RW-3 12/16/2016	RW-4 12/16/2016
Total Cadmium	5	< 3.0	< 3.0	< 3.0	< 3.0
Dissolved Cadmium	5	< 3.0	< 3.0	< 3.0	< 3.0
Total Chromium	50	34	< 10	< 10	< 10
Dissolved Chromium	50	31	< 10	< 10	< 10
Total Iron	600	< 100	1,280	119	< 100
Dissolved Iron	600	< 100	858	< 100	< 100

Notes and Abbreviations:

- (1) Water samples collected by Arcadis on the dates shown and submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for metals analysis using USEPA Method 6010. Results validated following protocols specified in Sampling and Analysis Plan in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016).
- (2) Beginning January 2012 metals analyses for recovery wells RW-1 and RW-4 are included with annual recovery well sampling performed in the fourth quarter of each year.

	Indicates an exceedance of an SCG.
700	Bold data indicates that the analyte was detected at or above its reporting limit.
< 5	Compound not detected above its laboratory quantification limit.
ELAP	Environmental Laboratory Approval Program
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
USEPA	U.S. Environmental Protection Agency
SCGs	standards, criteria, and guidance values
µg/L	micrograms per liter

Table 12
Summary of Water-Level Elevations,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Well Identification	Well Casing Elevation (ft msl)	Event Date	Baseline (1) 5/8/2009 (ft msl)	1Q2010 02/04/10 (ft msl)	2Q2010 04/23/10 (ft msl)	3Q2010 08/26/10 (ft msl)	4Q2010 12/10/10 (ft msl)	1Q2011 02/04/11 (ft msl)	2Q2011 05/20/11 (ft msl)	3Q2011 08/09/11 (ft msl)	4Q2011 10/26/11 (ft msl)	1Q2012 01/25/12 (ft msl)	2Q2012 05/02/12 (ft msl)	3Q2012 08/17/12 (ft msl)	4Q2012 10/05/12 (ft msl)	1Q2013 02/13/13 (ft msl)	2Q2013 05/13/13 (ft msl)
Recovery Wells																	
RW-1	125.18		69.75	70.67	74.38	72.52	71.11	70.96	72.13	70.44	72.72	73.15	72.12	71.71	71.21	70.35	70.89
RW-2	124.48		72.27	61.80	64.88	63.44	61.35	67.99	66.31	64.18	65.11	69.05	69.81	65.3	63.7	62.66	63.33
RW-3	122.84		69.40	67.64	71.4	69.44 ⁽⁴⁾	68.13	67.74	68.88	67.64	69.70	70.75	71.74	74.35 ⁽²⁾	68.06	68.01	68.73
RW-4	121.24		69.25	70.34	74.01	71.92	70.55	67.05	71.36	69.94	72.12	72.7	71.6	70.88	70.66	69.69	70.36
Monitoring Wells																	
B24MW-2	126.96		74.31	74.13	76.16	75.86	75.65	74.96	76.06	74.35	76.00	76.28	75.57	75.76	74.63	74.85	74.32
B24MW-3	127.11		72.63	72.16	75.87	74.10	72.89	72.40	74.04	72.27	74.44	74.63	73.67	73.62	72.69	72.2	72.41
B30MW-1	128.33		73.55	73.00	76.54	74.96	73.86	73.38	74.75	73.25	75.41	75.54	74.66	NM	73.66	73.11	73.28
BCPMW-1	125.73		73.16	72.67	76.26	74.66	73.43	72.94	74.75	72.94	75.05	75.23	74.29	74.22	73.27	NM	73.09
BCPMW-2	126.39		72.55	71.83	75.52	73.69	72.55	72.03	73.64	71.94	74.16	74.33	73.29	73.17	72.39	71.82	72.09
BCPMW-3	124.94		72.46	71.59	75.24	73.40	72.27	71.74	73.25	71.64	73.94	74.05	73.06	72.85	72.14	71.56	71.79
BCPMW-4-1	128.71		72.30	71.28	75	73.08	71.97	71.51	73.03	71.41	73.65	73.73	72.76	72.54	71.84	71.36	71.51
BCPMW-4-2	129.33		72.58	71.54	75.25	73.34	72.26	71.74	73.24	71.69	73.92	74.01	73.01	72.79	72.1	71.6	71.76
BCPMW-4-3	129.20		72.32	71.47	75.17	73.27	72.15	71.74	73.20	71.56	73.85	73.97	72.95	72.72	71.98	71.54	71.68
BCPMW-5-1	129.37		72.79	72.14	75.66	73.94	72.72	72.74	73.81	72.14	74.46	74.77	73.67	73.34	72.62	72.06	72.19
BCPMW-6-1	126.01		72.12	71.26	74.91	72.96	71.91	71.49	72.77	71.45	73.58	73.67	72.66	72.32	71.73	71.12	71.32
BCPMW-6-2	125.16		71.74	70.96	74.64	72.60	71.59	71.17	72.49	71.01	73.26	73.37	72.30	71.97	71.39	70.84	71.01
BCPMW-7-1	124.81		72.00	71.33	74.99	72.99	71.97	71.51	72.78	71.53	73.62	73.71	72.71	72.31	71.77	71.2	71.33
MW-200-1	123.49		72.16	71.37	75.07	73.14	72.08	71.72	72.98	71.52	73.69	73.83	72.76	72.59	71.91	71.34	71.53
MW-201-1	121.69		72.04	71.10	74.84	72.87	71.79	71.33	72.69	71.25	73.48	73.55	72.53	72.28	71.65	71.09	71.28
MW-202-1	119.27		71.90	71.13	74.83	72.82	71.77	71.32	72.66	71.21	73.46	73.57	73.51	72.23	71.6	70.98	71.23
MW-203-1	118.25		71.83	71.10	74.75	72.77	71.75	71.30	72.61	70.20	73.43	73.52	72.49	72.13	71.56	71.02	71.17
MW-204-1 ⁽⁵⁾	124.95		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-205-1 ⁽⁵⁾	123.47		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-206-1 ⁽⁵⁾	120.80		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-207-1a ⁽⁵⁾	120.38		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-207-1b ⁽⁵⁾	120.48		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-208-1 ⁽⁵⁾	118.56		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Piezometers																	
PZ-1a	128.82		72.56	71.15	74.87	72.94	71.85	71.33	72.76	71.31	73.54	73.62	72.63	72.42	71.72	71.23	71.39
PZ-1b	128.92		72.47	71.09	74.78	72.88	71.82	71.28	72.70	71.24	73.47	73.55	72.56	72.36	71.64	71.16	71.35
PZ-1c	128.96		72.47	71.48	75.15	73.23	72.13	71.74	73.16	71.56	73.83	73.9	72.90	72.68	71.94	71.46	71.63
PZ-2a	128.36		72.47	71.09	74.82	72.87	71.81	71.34	72.74	71.30	73.45	73.57	72.57	72.32	71.64	71.14	71.32
PZ-2b	128.37		72.43	71.08	74.77	72.86	71.78	71.30	72.68	71.27	73.45	73.55	72.54	72.28	71.61	71.13	71.29
PZ-2c	128.55		72.41	71.40	75.05	73.15	72.05	71.68	73.05	71.52	73.74	73.87	72.82	72.55	71.88	71.38	71.55
PZ-3	124.99		72.52	70.94	74.69	72.71	71.65	70.93	72.55	71.08	73.28	73.4	72.35	72.16	71.44	71.06	71.18
PZ-4	125.31		72.50	71.07	74.81	72.83	71.78	71.45	72.64	71.32	73.42	73.52	72.54	72.32	71.63	71.18	71.33
PZ-5a	129.07		72.50	71.94	75.61	73.79	72.59	72.17	73.70	71.98	74.27	74.39	73.40	73.25	72.45	71.94	72.16
PZ-5b	129.06		72.50	71.84	75.53	73.69	72.51	72.08	73.67	71.88	74.16	74.29	73.29	73.15	72.35	71.85	72.08
PZ-5c ⁽⁵⁾	128.84		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-6a	125.67		72.50	71.03	74.73	72.84	71.70	71.24	72.56	71.24	73.37	73.46	72.43	72.13	71.5	70.95	71.17
PZ-6b	125.74		72.50	70.93	74.7	72.65	71.58	71.11	72.46	71.14	73.28	73.37	72.34	72.05	71.43	70.88	71.11
PZ-7a	125.10		72.50	71.32	75.02	73.00	72.00	71.54	72.80	71.58	73.67	73.7	72.72	72.36	71.78	71.2	71.35
PZ-7b	125.06		72.50	71.21	74.85	72.83	71.83	71.37	72.68	71.26	73.45	73.53	72.51	72.13	71.54	71.05	71.16
PZ-8a ⁽⁵⁾	127.63		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-8b ⁽⁵⁾	127.54		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-8c ⁽⁵⁾	127.57		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-9a ⁽⁵⁾	125.30		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-10a ⁽⁵⁾	125.27		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes and abbreviations on last page.

Table 12
Summary of Water-Level Elevations,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Well Identification	Well Casing Elevation (ft msl)	Event Date	Baseline (1) 5/8/2009 (ft msl)	3Q2013 08/13/13 (ft msl)	4Q2013 11/01/13 (ft msl)	1Q2014 03/07/14 (ft msl)	2Q2014 06/03/14 (ft msl)	3Q2014 08/15/14 (ft msl)	4Q2014 12/23/2014 (ft. msl)	1Q2015 3/13/2015 (ft. msl)	2Q2015 5/28/2015 (ft. msl)	3Q2015 8/20/2015 (ft. msl)	4Q2015 12/17/2015 (ft. msl)	1Q2016 3/3/2016 (ft. msl)	2Q2016 5/27/2016 (ft. msl)	3Q2016 8/29/2016 (ft. msl)	4Q2016 11/8/2016 (ft. msl)
Recovery Wells																	
RW-1	125.18		69.75	71.62	69.31	68.08	69.97	69.83	69.40	70.16	70.53	68.69	67.43	67.55	67.23	65.32	64.10
RW-2	124.48		72.27	61.35	60.23	58.2	64.45	64.22	61.63	62.27	62.16	61.15	59.08	58.96	58.83	58.68	55.22
RW-3	122.84		69.40	72.29	67.11	64.49	66.97	67.09	66.11	67.08	67.43	NM	64.29	64.37	64.18	62.26	60.97
RW-4	121.24		69.25	71.19	68.69	67.37	69.39	68.80	68.63	69.39	69.76	68.02	66.78	66.84	66.61	64.60	63.46
Monitoring Wells																	
B24MW-2	126.96		74.31	73.81	72.88	72.65	73.48	73.93	73.49	74.20	73.80	72.63	NM	71.65	69.56	69.16	68.02
B24MW-3	127.11		72.63	73.14	68.24	69.82	71.67	71.77	71.17	NM	NM	NM	69.23	69.39	69.06	67.16	65.85
B30MW-1	128.33		73.55	73.97	72.26	70.73	72.61	72.21	72.02	72.79	72.92	71.45	70.05	70.21	70.93	67.98	66.72
BCPMW-1	125.73		73.16	73.51	71.66	70.27	72.86	72.40	71.77	72.58	72.56	70.77	NM	67.97	70.26	67.63	66.38
BCPMW-2	126.39		72.55	72.66	70.77	69.51	71.41	71.19	70.85	71.59	71.67	71.31	68.88	69.05	68.99	66.81	65.54
BCPMW-3	124.94		72.46	72.44	70.57	69.25	71.12	70.78	70.65	71.34	71.48	68.68	68.55	68.69	68.63	66.55	65.27
BCPMW-4-1	128.71		72.30	72.27	70.25	68.96	70.91	70.50	70.30	70.80	71.24	69.59	68.31	68.43	68.19	66.32	64.98
BCPMW-4-2	129.33		72.58	72.49	70.5	69.21	71.16	70.78	70.51	71.28	71.46	69.84	68.58	68.66	68.45	66.56	65.24
BCPMW-4-3	129.2		72.32	72.44	70.41	69.17	71.07	70.75	70.47	71.23	71.40	69.78	68.53	68.61	68.38	66.42	65.18
BCPMW-5-1	129.37		72.79	72.87	71.01	69.78	71.56	71.22	70.94	71.79	71.93	70.36	69.07	69.17	68.98	66.99	65.70
BCPMW-6-1	126.01		72.12	72.15	70.15	68.79	70.85	70.21	70.07	70.82	71.15	69.99	68.19	68.23	68.10	66.10	64.88
BCPMW-6-2	125.16		71.74	71.84	69.83	68.49	70.48	69.94	69.80	70.55	70.82	69.12	67.87	67.96	67.75	65.75	64.59
BCPMW-7-1	124.81		72.00	72.26	70.21	68.82	70.86	70.19	70.01	70.86	71.28	69.53	68.30	68.24	68.18	66.14	64.93
MW-200-1	123.49		72.16	72.31	70.37	69.06	71.03	70.55	70.29	71.08	71.32	69.71	68.48	68.55	68.23	66.40	65.11
MW-201-1	121.69		72.04	72.05	70.08	68.75	70.75	70.07	69.98	70.79	70.75	69.39	67.34	68.24	67.96	66.06	64.82
MW-202-1	119.27		71.90	--	70.06	68.75	70.70	70.13	69.97	70.83	71.10	69.43	68.17	68.18	67.98	66.00	64.82
MW-203-1	118.25		71.83	72.01	70.01	68.7	70.64	70.03	69.84	70.69	71.07	69.34	67.94	68.15	67.86	65.97	64.73
MW-204-1 ⁽¹⁾	125.25		--	--	--	--	--	--	--	--	--	--	61.66	68.48	68.23	66.37	65.06
MW-205-1 ⁽¹⁾	123.87		--	--	--	--	--	--	--	--	--	--	62.81	68.12	67.89	66.02	64.74
MW-206-1 ⁽¹⁾	121.25		--	--	--	--	--	--	--	--	--	--	63.65	68.20	67.91	66.00	64.80
MW-207-1a ⁽¹⁾	121.7		--	--	--	--	--	--	--	--	--	--	65.81	NM ⁽⁷⁾	NM ⁽⁷⁾	NM ⁽⁷⁾	NM ⁽⁷⁾
MW-207-1b ⁽¹⁾	121.17		--	--	--	--	--	--	--	--	--	--	66.51	NM ⁽⁷⁾	NM ⁽⁷⁾	NM ⁽⁷⁾	NM ⁽⁷⁾
MW-208-1 ⁽¹⁾	118.83		--	--	--	--	--	--	--	--	--	--	67.92	68.22	67.69	65.80	64.50
Piezometers																	
PZ-1a	128.82		72.56	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽³⁾	NM ⁽⁶⁾	NM ⁽⁶⁾	67.82	65.85	64.48
PZ-1b	128.92		72.47	72.06	70.34	68.77	70.69	70.27	70.41	70.82	71.07	69.37	68.17	68.21	68.14	66.21	64.82
PZ-1c	128.96		72.47	72.39	70.39	69.12	71.01	70.67	70.46	71.16	71.38	69.74	68.46	68.62	68.44	66.41	65.17
PZ-2a	128.36		72.47	72.06	70.08	68.73	70.74	70.23	70.03	70.78	71.08	69.40	68.12	68.22	68.03	66.08	64.82
PZ-2b	128.37		72.43	72.05	70.08	68.71	70.74	70.23	70.03	70.74	71.02	69.37	68.09	68.20	68.10	66.10	64.78
PZ-2c	128.55		72.41	72.34	70.33	69.02	70.93	70.58	70.31	71.04	71.28	69.64	68.29	68.53	68.28	66.30	65.08
PZ-3	124.99		72.52	71.92	69.95	68.61	70.60	70.07	70.86	70.72	70.92	69.25	68.02	68.10	67.93	66.01	64.66
PZ-4	125.31		72.50	72.05	70.09	68.76	70.70	70.25	70.01	NM ⁽³⁾	71.07	69.34	68.12	68.18	68.01	66.15	64.79
PZ-5a	129.07		72.50	72.84	70.85	69.62	71.47	71.34	70.95	71.67	71.84	70.25	68.99	69.41	68.86	66.90	65.63
PZ-5b	129.06		72.50	72.73	70.72	69.51	71.35	71.31	70.86	71.60	71.73	70.14	68.88	69.06	68.70	66.80	65.58
PZ-5c ⁽¹⁾	128.84		--	--	--	--	--	--	--	--	--	--	69.19	69.01	68.68	66.74	65.50
PZ-6a	125.67		72.50	71.91	69.94	68.53	70.63	69.99	69.83	70.59	70.96	69.26	67.98	68.04	72.15	65.89	64.67
PZ-6b	125.74		72.50	71.81	69.86	68.44	70.52	69.93	69.74	70.53	70.84	69.18	67.93	67.98	70.07	65.82	64.57
PZ-7a	125.10		72.50	72.26	70.26	68.84	70.90	70.19	70.02	70.89	NM ⁽³⁾	NM ⁽³⁾	NM ⁽⁶⁾	68.31	68.66	66.19	65.00
PZ-7b	125.06		72.50	71.54	70.07	68.68	70.64	70.06	69.94	70.72	71.06	69.36	68.18	68.18	67.96	65.97	64.78
PZ-8a ⁽¹⁾	127.63		--	--	--	--	--	--	--	--	--	--	65.31	67.94	67.83	65.89	64.57
PZ-8b ⁽¹⁾	127.54		--	--	--	--	--	--	--	--	--	--	65.55	68.06	67.89	65.92	64.67
PZ-8c ⁽¹⁾	127.57		--	--	--	--	--	--	--	--	--	--	65.76	68.40	68.16	66.15	64.96
PZ-9a ⁽¹⁾	125.82		--	--	--	--	--	--	--	--	--	--	69.49	69.84	69.57	67.59	66.29
PZ-10a ⁽¹⁾	125.57		--	--	--	--	--	--	--	--	--	--	68.95	69.58	69.06	67.06	65.64

Notes and abbreviations on last page.

Table 12
Summary of Water-Level Elevations,
Bethpage Park Groundwater Containment System,
Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

- (1) Baseline readings were taken prior to system startup, which occurred on July 21, 2009.
- (2) Measurement collected is believed to be anomalous.
- (3) Well casing is broken and blockage exists at around 2 feet below top of casing.
- (4) RW-3 water level measurement collected on September 9, 2010.
- (5) Wells installed by ERM in 2015.
- (6) Wells recently repaired and to be surveyed.
- (7) Well screen is blocked.
- ft msl feet relative to mean sea level
- NM not measured

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	B24MW-2 4/23/2009	B24MW-2 10/4/2010	B24MW-2 10/27/2011	B24MW-2 10/3/2012	B24MW-2 6/13/2013
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5.0 J
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5.0 J
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5.0 J
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50 J
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50 J
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 50 J
Acetone	NE	< 50 B	< 50	< 50 B	< 50	< 50 J
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.70 J
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5.0 J
Bromoform	50	< 5	< 5	< 5	< 5	< 5.0 J
Bromomethane	5	< 5	< 5	< 5	< 5	< 5.0 J
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5.0 J
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5.0 J
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5.0 J
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	0.41 J	< 5.0 J
Chloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
Chloroform	7	< 5	0.3 J	< 5	1.3 J	0.21 J
Chloromethane	5	< 5	< 5	< 5	< 5	< 5.0 J
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	1.9 J	0.23 J
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0 J
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5.0 J
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5.0 J
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5.0 J
Methyl-Tert-Butylether	5	--	< 5	--	0.45 J	0.21 J
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5.0 J
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5.0 J
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5.0 J
Toluene	5	< 5	< 5	< 5	< 5	< 5.0 J
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0 J
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0 J
Trichloroethene	5	3.7 J	4.4 J	3.2 J	25	4.3 J
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5.0 J
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2.0 J
o-Xylene	5	< 5	< 5	< 5	< 5	< 5.0 J
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5.0 J
Total VOCs⁽³⁾		3.7	4.7	3.2	29	5.0
Project VOCs⁽⁴⁾		3.7	4.4	3.2	27	4.5
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constituents (units in ug/L)	Sample Location: Sample Date:	B24MW-2 11/13/2014	B24MW-2 12/28/2015	B24MW-2 12/29/2016	B24MW-3 4/20/2009	B24MW-3 10/6/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	0.62 J	< 5
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 5	< 5
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 5	< 5
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 5	< 5
2-Butanone	NE	< 10	< 10	< 10	< 50	< 50
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 50 J	< 50
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 50 J	< 50
Acetone	NE	< 10	< 10	< 10	< 50	< 50
Benzene	1	< 1.0	< 0.50	< 0.50	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 5	< 5
Bromoform	50	< 4.0	< 1.0	< 1.0	< 5	< 5
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 5	< 5
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 5	< 5
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5	< 5
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Chloroform	7	< 1.0	< 1.0	< 1.0	< 5	< 5
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
cis-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	10	1.2 J
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 5	< 5
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 2.0	< 2.0	< 5	< 5
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	--	< 5
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 5	< 5
Styrene (Monomer)	5	< 5.0	< 1.0	< 1.0	< 5	< 5
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	0.51 J	< 5
Toluene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 5	< 5
Trichloroethene	5	2.7	2.7	2.4	45	5.9
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5	< 5
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	< 2	< 2
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Total VOCs⁽³⁾		2.7	2.7	2.4	56	7.1
Project VOCs⁽⁴⁾		2.7	2.7	2.4	56	7.1
1,4-Dioxane		--	0.185	0.417	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	B24MW-3 10/27/2011	B24MW-3 10/4/2012	B24MW-3 6/13/2013	B24MW-3 11/13/2014	B24MW-3 12/28/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5.0 J	< 1.0	< 1.0
1,1-Dichloroethane	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
1,1-Dichloroethene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 5	< 5	< 5.0 J	< 1.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5	< 5.0 J	< 1.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50 J	< 10	< 10
2-Hexanone	50	< 50	< 50	< 50 J	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50 J	< 5.0	< 5.0
Acetone	NE	< 50	< 50	< 50 J	< 10 J	< 10
Benzene	1	< 0.7	< 0.7	< 0.70 J	< 1.0	< 0.50
Bromodichloromethane	50	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Bromoform	50	< 5	< 5	< 5.0 J	< 4.0	< 1.0
Bromomethane	5	< 5	< 5	< 5.0 J	< 2.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5.0 J	< 2.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5.0 J	< 5.0	< 5.0
Chloroethane	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Chloroform	7	0.32 J	0.38 J	1.3 J	0.28 J	0.30 J
Chloromethane	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	0.4 J	0.62 J	< 5.0 J	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5.0 J	< 5.0	< 2.0
Ethylbenzene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Methyl-Tert-Butylether	5	--	< 5	< 5.0 J	< 1.0	< 1.0
Methylene Chloride	5	< 5	< 5	< 5.0 J	< 2.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5.0 J	< 5.0	< 1.0
Tetrachloroethene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Toluene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Trichloroethene	5	1.4 J	1 J	0.44 J	< 1.0	0.25 J
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5.0 J	< 5.0	< 5.0
Vinyl Chloride	2	< 2	< 2	< 2.0 J	< 1.0	< 1.0
o-Xylene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5.0 J	< 1.0	< 1.0
Total VOCs⁽³⁾		2.1	2	1.7	0.28	0.55
Project VOCs⁽⁴⁾		1.8	1.6	0.4	0	0.25
1,4-Dioxane		--	--	--	--	0.257

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	B24MW-3 1/20/2017	B30MW-1 4/23/2009	B30MW-1 10/4/2010	B30MW-1 10/27/2011	B30MW-1 10/3/2012
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 5	< 5	< 5	< 5
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 5	< 5	< 5	< 5
1,1,1,2-Trichloroethane	1	< 1.0	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 1.0	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 1.0	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 1.0	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 1.0	< 5	< 5	< 5	< 5
2-Butanone	NE	< 10	< 50	< 50	< 50	< 50
2-Hexanone	50	< 5.0	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 5.0	< 50	< 50	< 50	< 50
Acetone	NE	< 10	< 50 B	< 50 B	< 50	< 50
Benzene	1	< 0.50	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	< 5	< 5	< 5	< 5
Bromoform	50	< 1.0	< 5	< 5	< 5	< 5
Bromomethane	5	< 2.0	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 2.0	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	< 1.0	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 1.0	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5	< 5	< 5	< 5
Chloroethane	5	< 1.0	< 5	< 5	< 5	< 5
Chloroform	7	< 1.0	< 5	< 5	< 5	< 5
Chloromethane	5	< 1.0	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	< 1.0	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	0.4	< 1.0	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	< 1.0	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 1.0	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	< 1.0	--	< 5	--	< 5
Methylene Chloride	5	< 2.0	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	< 1.0	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 1.0	< 5	< 5	< 5	< 5
Toluene	5	< 1.0	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	< 5	< 5	< 5	< 5
Trichloroethene	5	< 1.0	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 1.0	< 2	< 2	< 2	< 2
o-Xylene	5	< 1.0	< 5	< 5	< 5	< 5
m,p-Xylene	5	< 1.0	< 5	< 5	< 5	< 5
Total VOCs⁽³⁾		0	0	0	0	0
Project VOCs⁽⁴⁾		0	0	0	0	0
1,4-Dioxane		0.918	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	B30MW-1 6/14/2013	B30MW-1 11/13/2014	B30MW-1 12/31/2015	B30MW-1 1/4/2017	BCPMW-1 4/28/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,1,1,2,2-Tetrachloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,1,1,2-Trichloroethane	1	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,1-Dichloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	0.37 J
1,1-Dichloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,2-Dichloroethane	0.6	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,2-Dichloropropane	1	< 5.0	< 1.0	< 1.0	< 1.0	< 5
2-Butanone	NE	< 50	< 10	< 10	< 10	< 50
2-Hexanone	50	< 50	< 5.0	< 5.0	< 5.0	< 50
4-Methyl-2-Pentanone	50	< 50	< 5.0	< 5.0	< 5.0	< 50
Acetone	NE	< 50	< 10	< 10	< 10	< 50 B
Benzene	1	< 0.70	< 1.0	< 0.50	< 0.50	< 0.7
Bromodichloromethane	50	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Bromoform	50	< 5.0	< 4.0	< 1.0	< 1.0	< 5
Bromomethane	5	< 5.0	< 2.0	< 2.0	< 2.0	< 5
Carbon Disulfide	60	< 5.0	< 2.0	< 2.0	< 2.0	< 5
Carbon Tetrachloride	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chlorobenzene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0	< 5
Chloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chloroform	7	< 5.0	< 1.0	< 1.0	< 1.0	0.88 J
Chloromethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
cis-1,2-Dichloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	22
cis-1,3-Dichloropropene	0.4	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chlorodibromomethane	50	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 5.0	< 2.0	< 2.0	< 5
Ethylbenzene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Methyl-Tert-Butylether	5	< 5.0	< 1.0	< 1.0	< 1.0	--
Methylene Chloride	5	< 5.0	< 2.0	< 2.0	< 2.0	0.52 J
Styrene (Monomer)	5	< 5.0	< 5.0	< 1.0	< 1.0	< 5
Tetrachloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Toluene	5	< 5.0	< 1.0	< 1.0	< 1.0	0.33 J
trans-1,2-Dichloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	0.44 J
trans-1,3-Dichloropropene	0.4	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Trichloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	190
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5
Vinyl Chloride	2	< 2.0	< 1.0	< 1.0	< 1.0	< 2
o-Xylene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
m,p-Xylene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Total VOCs⁽³⁾		<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	220
Project VOCs⁽⁴⁾		<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	210
1,4-Dioxane		--	--	< 0.10	< 0.200	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-2 4/28/2009	BCPMW-3 4/29/2009	BCPMW-4-1 4/17/2009	BCPMW-4-1 12/1/2009	BCPMW-4-1 10/4/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 10	< 25	< 25	2.4 J	14 J
1,1,1,2,2-Tetrachloroethane	5	< 10	< 25	< 25	< 5	< 25
1,1,2-Trichloroethane	1	< 10	< 25	< 25	0.38 J	< 25
1,1-Dichloroethane	5	8 J	9.6 J	6.5 J	46	38
1,1-Dichloroethene	5	3.8 J	43	1.8 J	14	21 J
1,2-Dichloroethane	0.6	0.68 J	< 25	< 25	0.65 J	< 25
1,2-Dichloropropane	1	< 10	< 25	< 25	4.7 J	3.8 J
2-Butanone	NE	< 100	< 250	< 250	< 50	< 250
2-Hexanone	50	< 100	< 250	< 250 J	< 50	< 250
4-Methyl-2-Pentanone	50	< 100	< 250	< 250 J	< 50	< 250
Acetone	NE	< 100	< 250	< 250 J	< 50	< 250
Benzene	1	< 1.4	< 3.5	< 3.5	0.44 J	< 3.5
Bromodichloromethane	50	< 10	< 25	< 25	< 5	< 25
Bromoform	50	< 10	< 25	< 25	< 5	< 25
Bromomethane	5	< 10	< 25	< 25	R	< 25
Carbon Disulfide	60	< 10	< 25	< 25	< 5	< 25
Carbon Tetrachloride	5	< 10	< 25	< 25	< 5	< 25
Chlorobenzene	5	< 10	< 25	< 25	< 5	< 25
Chlorodifluoromethane (Freon 22)	NE	< 10	< 25	17 J	6.2	4.3 J
Chloroethane	5	< 10	< 25	< 25	2.4 J	4.1 J
Chloroform	7	< 10	< 25	< 25	< 5	< 25
Chloromethane	5	< 10	< 25	< 25	R	< 25
cis-1,2-Dichloroethene	5	310	900	1,800 D	750 D	510
cis-1,3-Dichloropropene	0.4	< 10	< 25	< 25	< 5	< 25
Chlorodibromomethane	50	< 10	< 25	< 25	< 5	< 25
Dichlorodifluoromethane (Freon 12)	5	< 10	< 25	< 25	< 5	< 25
Ethylbenzene	5	< 10	< 25 B	< 25	< 5	< 25
Methyl-Tert-Butylether	5	--	--	--	--	< 25
Methylene Chloride	5	< 10	< 25	< 25	< 5	< 25
Styrene (Monomer)	5	< 10	< 25	< 25	< 5	< 25
Tetrachloroethene	5	1.5 J	< 25	< 25	0.64 J	< 25
Toluene	5	< 10	< 25 B	< 25	< 5	< 25
trans-1,2-Dichloroethene	5	2.4 J	8.9 J	110	2.5 J	3.9 J
trans-1,3-Dichloropropene	0.4	< 10	< 25	< 25	< 5	< 25
Trichloroethene	5	180	470	22 J	170	45
Trichlorotrifluoroethane (Freon 113)	5	< 10	< 25	< 25	< 5	< 25
Vinyl Chloride	2	4.1	300	180	540 D	220
o-Xylene	5	< 10	< 25 B	< 25	8	< 25
m,p-Xylene	5	< 10	< 25 B	< 25	< 5	< 25
Total VOCs⁽³⁾		510	1,700	2,100	1,500	860
Project VOCs⁽⁴⁾		510	1,700	2,100	1,500	850
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-1 10/28/2011	BCPMW-4-1 10/3/2012	BCPMW-4-1 6/5/2013	BCPMW-4-1 11/17/2014	BCPMW-4-1 10/8/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	10 J	29	5.1	2.4	4.2
1,1,2,2-Tetrachloroethane	5	< 25	< 25	< 5.0	< 1.0	
1,1,2-Trichloroethane	1	< 25	1.7 J	0.24 J	0.42 J	1.1
1,1-Dichloroethane	5	18 J	39	7.4	7.3	13.3
1,1-Dichloroethene	5	13 J	24 J	4.1 J	1.1	0.98 J
1,2-Dichloroethane	0.6	2.1 J	4.8 J	0.95 J	0.70 J	0.97 J
1,2-Dichloropropane	1	1.9 J	5.1 J	0.95 J	0.61 J	0.95
2-Butanone	NE	< 250	< 250	< 50	< 10	< 10
2-Hexanone	50	< 250	< 250	< 50	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 250	< 250	< 50	< 5.0	< 5.0
Acetone	NE	< 250B	< 250	< 50	< 10	< 10
Benzene	1	< 3.5	< 3.5	< 0.70	< 1.0	< 0.50
Bromodichloromethane	50	< 25	< 25	< 5.0	< 1.0	< 1.0
Bromoform	50	< 25	< 25	< 5.0	< 4.0	< 1.0
Bromomethane	5	< 25	< 25	< 5.0	< 2.0	< 2.0
Carbon Disulfide	60	< 25	< 25	< 5.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 25	< 25	< 5.0	< 1.0	< 1.0
Chlorobenzene	5	< 25	< 25	< 5.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	2.5 J	< 25	1.1 J	< 5.0	< 5.0
Chloroethane	5	< 25	1.6 J	0.46 J	< 1.0	< 1.0
Chloroform	7	< 25	< 25	< 5.0	0.61 J	0.70 J
Chloromethane	5	< 25	< 25	< 5.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	500	840	310 D	207 D	156
cis-1,3-Dichloropropene	0.4	< 25	< 25	< 5.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 25	< 25	< 5.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 25	< 25	< 5.0	< 5.0	< 2.0
Ethylbenzene	5	< 25	< 25	< 5.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 25	< 25	< 5.0	< 1.0	< 1.0
Methylene Chloride	5	< 25 B	< 25	< 5.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 25	< 25	< 5.0	< 5.0	< 1.0
Tetrachloroethene	5	< 25	< 25	0.37 J	0.80 J	1.1
Toluene	5	< 25	< 25	< 5.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	1.3 J	2.2 J	0.78 J	0.59 J	< 1.0
trans-1,3-Dichloropropene	0.4	< 25	< 25	< 5.0	< 1.0	< 1.0
Trichloroethene	5	43	110	16	34.7	68.1
Trichlorotrifluoroethane (Freon 113)	5	< 25	< 25	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	32	420	47	21	13
o-Xylene	5	< 25	< 25	< 5.0	< 1.0	< 1.0
m,p-Xylene	5	< 25	< 25	< 5.0	< 1.0	< 1.0
Total VOCs⁽³⁾		620	1,500	390	280	260
Project VOCs⁽⁴⁾		619.6	1,500	390	280	260
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-1 12/30/2015	BCPMW-4-1 12/28/2016	BCPMW-4-2 4/17/2009	BCPMW-4-2 12/4/2009	BCPMW-4-2 10/7/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	7.3	<i>0.36 J</i>	< 250	< 10	< 5
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 250	< 10	< 5
1,1,1,2-Trichloroethane	1	1.7	< 1.0	< 250	< 10	< 5
1,1-Dichloroethane	5	27.1	3.2	57 J	8.7 J	7.3
1,1-Dichloroethene	5	1.7	0.42 J	34 J	2.7 J	1.9 J
1,2-Dichloroethane	0.6	1.3	0.87 J	< 250	< 10	0.91 J
1,2-Dichloropropane	1	1.5	< 1.0	< 250	< 10	0.9 J
2-Butanone	NE	< 10	< 10	< 2,500	< 100	< 50
2-Hexanone	50	< 5.0	< 5.0	< 2,500 J	< 100	< 50
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 2,500 J	< 100	< 50
Acetone	NE	< 10	< 10	< 2,500 J	< 100	< 50 B
Benzene	1	< 0.50	< 0.50	< 35	< 1.4	< 0.7
Bromodichloromethane	50	< 1.0	< 1.0	< 250	< 10	< 5
Bromoform	50	< 1.0	< 1.0	< 250	< 10	< 5
Bromomethane	5	< 2.0	< 2.0	< 250	< 10	< 5
Carbon Disulfide	60	< 2.0	< 2.0	< 250	< 10	< 5
Carbon Tetrachloride	5	< 1.0	< 1.0	< 250	< 10	< 5
Chlorobenzene	5	< 1.0	< 1.0	< 250	< 10	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 250	0.8 J	< 5
Chloroethane	5	< 1.0	< 1.0	< 250	1.1 J	0.79 J
Chloroform	7	1.1	1.4	< 250	< 10	0.96 J
Chloromethane	5	< 1.0	< 1.0	< 250	R	< 5
cis-1,2-Dichloroethene	5	252 D	81.4	18,000 D	270	99
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 250	< 10	< 5
Chlorodibromomethane	50	< 1.0	< 1.0	< 250	< 10	< 5
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 250	< 10	< 5
Ethylbenzene	5	< 1.0	< 1.0	62 J	0.78 J	< 5
Methyl-Tert-Butylether	5	< 1.0	< 1.0	--	--	0.35 J
Methylene Chloride	5	< 2.0	< 2.0	< 250	< 10	< 5
Styrene (Monomer)	5	< 1.0	< 1.0	< 250	< 10	< 5
Tetrachloroethene	5	1.1	0.50 J	< 250	0.82 J	0.73 J
Toluene	5	< 1.0	< 1.0	2,400	< 10 B	< 5
trans-1,2-Dichloroethene	5	0.86 J	0.49 J	< 250	1.3 J	0.65 J
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 250	< 10	< 5
Trichloroethene	5	81.5	48.2	< 250	310	66
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 250	< 10	< 5
Vinyl Chloride	2	197	3.3	6,300	58	54
o-Xylene	5	0.70 J	< 1.0	110 J	< 10 B	< 5
m,p-Xylene	5	< 1.0	< 1.0	190 J	< 10 B	< 5
Total VOCs⁽³⁾		570	140	27,000	660	230
Project VOCs⁽⁴⁾		570	140	27,000	650	230
1,4-Dioxane		37.7	39.3	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-2 10/28/2011	BCPMW-4-2 10/3/2012	BCPMW-4-2 6/5/2013	BCPMW-4-2 11/18/2014	BCPMW-4-2 10/8/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	0.33 J	0.23 J	0.22 J	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1-Dichloroethane	5	2.6 J	1.4 J	1.5 J	< 1.0	0.48 J
1,1-Dichloroethene	5	1.1 J	0.8 J	0.49 J	< 1.0	< 1.0
1,2-Dichloroethane	0.6	0.85 J	0.45 J	0.52 J	< 1.0	< 1.0
1,2-Dichloropropane	1	0.39 J	< 5	< 5.0	< 1.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 10	< 10
2-Hexanone	50	< 50	< 50	< 50	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 5.0	< 5.0
Acetone	NE	< 50	< 50	1.8 J	< 10	< 10
Benzene	1	< 0.7	< 0.7	< 0.70	< 1.0	< 0.50
Bromodichloromethane	50	< 5	< 5	< 5.0	< 1.0	< 1.0
Bromoform	50	< 5	< 5	< 5.0	< 4.0	< 1.0
Bromomethane	5	< 5	< 5	< 5.0	< 2.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chloroform	7	0.62 J	0.54 J	3.3 J	3.2	1.3
Chloromethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	59	70	47	8.6	29.7
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5.0	< 5.0	< 2.0
Ethylbenzene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	0.28 J	0.29 J	0.26 J	< 1.0	< 1.0
Methylene Chloride	5	< 5	< 5	< 5.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Tetrachloroethene	5	0.59 J	0.91 J	0.63 J	< 1.0	< 1.0
Toluene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	0.41 J	0.5 J	0.40 J	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	< 1.0
Trichloroethene	5	50	68	56	9.1	25.6
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	20	9.5	9.7	1.6	3.7
o-Xylene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Total VOCs⁽³⁾		140	150	120	23	61
Project VOCs⁽⁴⁾		130	150	120	19	59
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-4-2	BCPMW-4-2 (REP)	BCPMW-4-2	BCPMW-4-2 (REP)
	Sample Date:	12/31/2015	12/31/2015	12/22/2016	12/22/2016
	NYSDEC SCGs				
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	0.23 J	0.24 J	0.22 J	0.23 J
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	2.0	2.0	3.9	3.6
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	13.3	13.2	16.9	17.4
cis-1,3,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	0.27 J
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	0.62 J	0.58 J
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	16.0	16.3	18.0	18.1
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	0.96 J	0.92 J	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs⁽³⁾		32	33	40	40
Project VOCs⁽⁴⁾		30	31	36	37
1,4-Dioxane		0.858	0.982	2.34	2.40

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-3 4/17/2009	BCPMW-4-3 12/1/2009	BCPMW-4-3 10/7/2010	BCPMW-4-3 10/28/2011	BCPMW-4-3 10/3/2012
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50 J	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 50 J	< 50	< 50	< 50	< 50
Acetone	NE	< 50 J	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	0.53 J	0.32 J	< 5	< 5	0.2 J
Chloromethane	5	< 5	R	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	0.37 J	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	--	--	< 5	< 5	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	0.27 J	0.3 J
Toluene	5	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	0.56 J	0.51 J	0.41 J	0.74 J	0.84 J
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	0.38 J	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2
o-Xylene	5	< 5	< 5	< 5	< 5	< 5
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5
Total VOCs⁽³⁾		1.5	0.83	0.41	1.4	1.3
Project VOCs⁽⁴⁾		0.93	0.51	0.41	1.0	1.1
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York ^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-3 (REP) 6/5/2013	BCPMW-4-3 6/5/2013	BCPMW-4-3 11/17/2014	BCPMW-4-3 12/31/2015	BCPMW-4-3 12/22/2016
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 50	< 50	< 10	< 10	< 10
2-Hexanone	50	< 50	< 50	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 5.0	< 5.0	< 5.0
Acetone	NE	< 50	< 50	< 10	< 10	< 10
Benzene	1	< 0.70	< 0.70	< 1.0	< 0.50	< 0.50
Bromodichloromethane	50	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 5.0	< 5.0	< 4.0	< 1.0	< 1.0
Bromomethane	5	< 5.0	< 5.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 5.0	< 5.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0 J	< 5.0
Chloroethane	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Chloroform	7	0.97 J	1.1 J	0.58 J	< 1.0	0.52 J
Chloromethane	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 5.0	< 5.0	< 2.0	< 2.0
Ethylbenzene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 5.0	< 5.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5.0	< 5.0	< 5.0	< 1.0	< 1.0
Tetrachloroethene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Toluene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	0.34 J	0.39 J	< 1.0	< 1.0	< 1.0
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0 J	< 5.0
Vinyl Chloride	2	< 2.0	< 2.0	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 5.0	< 5.0	< 1.0	< 1.0	< 1.0
Total VOCs ⁽³⁾		1.3	1.5	0.58	0	0.52
Project VOCs ⁽⁴⁾		0.34	0.39	0	0	0
1,4-Dioxane		--	--	--	0.263	0.776

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York ^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-5-1 4/23/2009	BCPMW-6-1 4/20/2009	BCPMW-6-1 12/4/2009	BCPMW-6-1 10/6/2010	BCPMW-6-1 10/31/2011
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 100	< 5	< 5	< 100	< 250
1,1,1,2,2-Tetrachloroethane	5	< 100	< 5	< 5	< 100	< 250
1,1,1,2-Trichloroethane	1	< 100	< 5	< 5	< 100	< 250
1,1-Dichloroethane	5	< 100	0.3 J	< 5	< 100	< 250
1,1-Dichloroethene	5	21 J	< 5	< 5	< 100	< 250
1,2-Dichloroethane	0.6	< 100	< 5	< 5	< 100	< 250
1,2-Dichloropropane	1	< 100	< 5	< 5	< 100	< 250
2-Butanone	NE	< 1,000	< 50	< 50	< 1,000	< 2,500
2-Hexanone	50	< 1,000	< 50 J	< 50	< 1,000	< 2,500
4-Methyl-2-Pentanone	50	< 1,000	< 50 J	< 50	< 1,000	< 2,500
Acetone	NE	< 1,000	< 50 J	< 50	< 1,000	< 2,500
Benzene	1	< 14	< 0.7	< 0.7	< 14	< 35
Bromodichloromethane	50	< 100	< 5	< 5	< 100	< 250
Bromoform	50	< 100	< 5	< 5	< 100	< 250
Bromomethane	5	< 100	< 5	R	< 100	< 250
Carbon Disulfide	60	< 100	< 5	< 5	< 100	< 250
Carbon Tetrachloride	5	< 100	< 5	< 5	< 100	< 250
Chlorobenzene	5	< 100	< 5	< 5	< 100	< 250
Chlorodifluoromethane (Freon 22)	NE	< 100	4,500 D	1,700 EJ	10,000 D	7,100
Chloroethane	5	< 100	< 5	< 5	< 100	< 250
Chloroform	7	< 100	1.7 J	0.32 J	< 100	< 250
Chloromethane	5	< 100	< 5	R	< 100	< 250
cis-1,2-Dichloroethene	5	960	21	1.7 J	< 100	< 250
cis-1,3-Dichloropropene	0.4	< 100	< 5	< 5	< 100	< 250
Chlorodibromomethane	50	< 100	< 5	< 5	< 100	< 250
Dichlorodifluoromethane (Freon 12)	5	< 100	< 5	< 5	< 100	< 250
Ethylbenzene	5	48 J	< 5	< 5	< 100	< 250
Methyl-Tert-Butylether	5	--	--	--	<100	< 250
Methylene Chloride	5	< 100	< 5	< 5	< 100	< 250
Styrene (Monomer)	5	< 100	< 5	< 5	< 100	< 250
Tetrachloroethene	5	< 100	0.34 J	< 5	< 100	< 250
Toluene	5	2,700	< 5	< 5	< 100	< 250
trans-1,2-Dichloroethene	5	< 100	< 5	< 5	< 100	< 250
trans-1,3-Dichloropropene	0.4	< 100	< 5	< 5	< 100	< 250
Trichloroethene	5	220	4.9 J	1.6 J	< 100	< 250
Trichlorotrifluoroethane (Freon 113)	5	< 100	< 5	< 5	< 100	< 250
Vinyl Chloride	2	330	< 2	< 2	< 40	< 100
o-Xylene	5	40 J	< 5	< 5	< 100	< 250
m,p-Xylene	5	110	< 5	< 5	< 100	< 250
Total VOCs ⁽³⁾		4,400	4,500	1,700	10,000	7,100
Project VOCs ⁽⁴⁾		4,400	27	2.3	0	0
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-1 10/3/2012	BCPMW-6-1 6/7/2013	BCPMW-6-1 11/11/2014	BCPMW-6-1 12/23/2015	BCPMW-6-1 12/27/2016
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 100	< 13	< 1.0	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 100	< 13	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 100	< 13	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 100	< 13	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 100	< 13	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 100	< 13	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 1,000	< 130	< 10	< 10	< 10
2-Hexanone	50	< 1,000	< 130	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 1,000	< 130	< 5.0	< 5.0	< 5.0
Acetone	NE	< 1,000	< 130	< 10	< 10	< 10
Benzene	1	< 14	< 1.8	< 1.0	< 0.50	< 0.50
Bromodichloromethane	50	< 100	< 13	< 1.0	< 1.0	< 1.0
Bromoform	50	< 100	< 13	< 4.0	< 1.0	< 1.0
Bromomethane	5	< 100	< 13	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 100	< 13	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	2,100	400	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Chloroform	7	< 100	< 13	< 1.0	< 1.0	< 1.0
Chloromethane	5	< 100	< 13	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 100	< 13	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 100	< 13	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 100	< 13	< 5.0	< 2.0	< 2.0
Ethylbenzene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 100	< 13	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 100	< 13	< 5.0	< 1.0	< 1.0
Tetrachloroethene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Toluene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 100	< 13	< 1.0	< 1.0	< 1.0
Trichloroethene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Trichlorotrifluoroethane (Freon 113)	5	< 100	< 13	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 40	< 5.0	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 100	< 13	< 1.0	< 1.0	< 1.0
Total VOCs ⁽³⁾		2,100	400	0	0	0
Project VOCs ⁽⁴⁾		0	0	0	0	0
1,4-Dioxane		--	--	--	< 0.10	< 0.200

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-2 5/8/2009	BCPMW-6-2 12/4/2009	BCPMW-6-2 10/6/2010	BCPMW-6-2 10/31/2011	BCPMW-6-2 10/3/2012
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	0.78 J	< 5	< 5	< 5
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	0.37 J	0.65 J	0.47 J	0.41 J	0.23 J
1,1-Dichloroethene	5	< 5	0.44 J	< 5	0.3 J	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	R	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	0.64 J
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	0.53 J	< 5	0.41 J	0.3 J	0.38 J
Chloromethane	5	< 5	R	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	--	--	< 5	0.33 J	0.24 J
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	0.79 J	2.1 J	1.8 J	1.6 J
Toluene	5	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	< 5	0.45 J	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2
o-Xylene	5	< 5	< 5	< 5	< 5	< 5
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5
Total VOCs⁽³⁾		0.9	3.1	2.98	3.1	3.1
Project VOCs⁽⁴⁾		0.37	3.1	2.59	2.51	1.83
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-2 6/5/2013	BCPMW-6-2 11/11/2014	BCPMW-6-2 12/23/2015	BCPMW-6-2 12/27/2016	BCPMW-7-1 4/20/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,1,1,2,2-Tetrachloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,1,1,2-Trichloroethane	1	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,1-Dichloroethane	5	0.31 J	0.41 J	< 1.0	< 1.0	< 5
1,1-Dichloroethene	5	< 5.0 J	< 1.0	< 1.0	< 1.0	< 5
1,2-Dichloroethane	0.6	< 5.0	< 1.0	< 1.0	< 1.0	< 5
1,2-Dichloropropane	1	< 5.0	< 1.0	< 1.0	< 1.0	< 5
2-Butanone	NE	< 50	< 10	< 10	< 10	< 50
2-Hexanone	50	< 50	< 5.0	< 5.0	< 5.0	< 50 J
4-Methyl-2-Pentanone	50	< 50	< 5.0	< 5.0	< 5.0	< 50 J
Acetone	NE	< 50	< 10	< 10	< 10	< 50
Benzene	1	< 0.70 J	< 1.0	< 0.50	< 0.50	< 0.7
Bromodichloromethane	50	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Bromoform	50	< 5.0	< 4.0	< 1.0	< 1.0	< 5
Bromomethane	5	< 5.0	< 2.0	< 2.0	< 2.0	< 5
Carbon Disulfide	60	< 5.0	< 2.0	< 2.0	< 2.0	< 5
Carbon Tetrachloride	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chlorobenzene	5	< 5.0 J	< 1.0	< 1.0	< 1.0	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0	2.6 J
Chloroethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chloroform	7	0.93 J	0.30 J	< 1.0	< 1.0	< 5
Chloromethane	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
cis-1,2-Dichloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
cis-1,3-Dichloropropene	0.4	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Chlorodibromomethane	50	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 5.0	< 2.0	< 2.0	< 5
Ethylbenzene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Methyl-Tert-Butylether	5	0.36 J	0.26 J	< 1.0	< 1.0	--
Methylene Chloride	5	< 5.0	< 2.0	< 2.0	< 2.0	< 5
Styrene (Monomer)	5	< 5.0	< 5.0	< 1.0	< 1.0	< 5
Tetrachloroethene	5	1.3 J	0.35 J	< 1.0	< 1.0	< 5
Toluene	5	< 5.0 J	< 1.0	< 1.0	< 1.0	< 5
trans-1,2-Dichloroethene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
trans-1,3-Dichloropropene	0.4	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Trichloroethene	5	< 5.0 J	< 1.0	< 1.0	< 1.0	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5
Vinyl Chloride	2	< 2.0	< 1.0	< 1.0	< 1.0	< 2
o-Xylene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
m,p-Xylene	5	< 5.0	< 1.0	< 1.0	< 1.0	< 5
Total VOCs⁽³⁾		2.9	1.3	0	0	2.6
Project VOCs⁽⁴⁾		1.6	0.76	0	0	0
1,4-Dioxane		--	--	< 0.10	< 0.200	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-7-1 12/1/2009	BCPMW-7-1 10/7/2010	BCPMW-7-1 11/1/2011	BCPMW-7-1 10/4/2012	BCPMW-7-1 6/7/2013
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5.0
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5.0
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5.0
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5.0
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5.0
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.70
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5.0
Bromoform	50	< 5	< 5	< 5	< 5	< 5.0
Bromomethane	5	R	< 5	< 5	< 5	< 5.0
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5.0
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5.0
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5.0
Chlorodifluoromethane (Freon 22)	NE	1.5 J	5.2	9.2	3.6 J	2.5 J
Chloroethane	5	< 5	< 5	< 5	< 5	< 5.0
Chloroform	7	< 5	< 5	< 5	0.37 J	0.29 J
Chloromethane	5	R	< 5	< 5	< 5	< 5.0
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5.0
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5.0
Methyl-Tert-Butylether	5	--	< 5	0.22 J	0.26 J	0.22 J
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5.0
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5.0
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5.0
Toluene	5	< 5	< 5	< 5	< 5	< 5.0
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0
Trichloroethene	5	< 5	< 5	< 5	< 5	< 5.0
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5.0
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2.0
o-Xylene	5	< 5	< 5	< 5	< 5	< 5.0
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5.0
Total VOCs⁽³⁾		1.5	5.2	9.4	4.2	3.0
Project VOCs⁽⁴⁾		0	0	0.2	0	0
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	BCPMW-7-1 11/18/2014	BCPMW-7-1 12/22/2015	BCPMW-7-1 12/28/2016	MW-200-1 4/29/2009	MW-200-1 12/2/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 5	< 5
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	0.79 J	< 5
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 5	< 5
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 5	< 5
2-Butanone	NE	< 10 J	< 10	< 10	< 50	< 50
2-Hexanone	50	< 5.0 J	< 5.0	< 5.0	< 50	< 50
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 50	< 50
Acetone	NE	< 10 J	< 10	< 10	< 50 B	< 50
Benzene	1	< 1.0	< 0.50	< 0.50	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 5	< 5
Bromoform	50	< 4.0	< 1.0	< 1.0	< 5	< 5
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 5	R
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 5	< 5
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5	< 5
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Chloroform	7	0.25 J	< 1.0	< 1.0	2.3 J	2.3 J
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 5	R
cis-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	38	5.7
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 5	< 5
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 2.0	< 2.0	< 5	< 5
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	--	--
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 5	< 5
Styrene (Monomer)	5	< 5.0	< 1.0	< 1.0	< 5	< 5
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	0.54 J	< 5
Toluene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	0.3 J	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 5	< 5
Trichloroethene	5	< 1.0	< 1.0	< 1.0	34	12
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5	< 5
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	< 2	< 2
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 5	< 5
Total VOCs⁽³⁾		0.25	0	0	770	20
Project VOCs⁽⁴⁾		0	0	0	74	18
1,4-Dioxane		--	< 0.10	< 0.200	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-200-1 10/5/2010	MW-200-1 11/3/2011	MW-200-1 10/4/2012	MW-200-1 5/31/2013	MW-200-1 11/18/2014
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5.0	< 1.0
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 50	< 10
2-Hexanone	50	< 50	< 50	< 50	< 50	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 5.0
Acetone	NE	< 50	< 50	< 50	< 50	< 10
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.70	< 1.0
Bromodichloromethane	50	< 5	< 5	< 5	< 5.0	< 1.0
Bromoform	50	< 5	< 5	< 5	< 5.0	< 4.0
Bromomethane	5	< 5	< 5	< 5	< 5.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5	< 5.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5	< 5.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5.0	< 5.0
Chloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
Chloroform	7	0.5 J	0.21 J	< 5	< 5.0	< 1.0
Chloromethane	5	< 5	< 5	< 5	< 5.0	< 1.0
cis-1,2-Dichloroethene	5	3.5 J	11	1.5 J	0.41 J	< 1.0
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5	< 5.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5.0	< 5.0
Ethylbenzene	5	< 5	< 5	< 5	< 5.0	< 1.0
Methyl-Tert-Butylether	5	< 5	< 5	< 5	< 5.0	< 1.0
Methylene Chloride	5	< 5	< 5	< 5	< 5.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5	< 5.0	< 5.0
Tetrachloroethene	5	< 5	0.43 J	< 5	< 5.0	< 1.0
Toluene	5	< 5	< 5	< 5	< 5.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5.0	< 1.0
Trichloroethene	5	7	20	3.8 J	1.3 J	< 1.0
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5.0	< 5.0
Vinyl Chloride	2	< 2	< 2	< 2	< 2.0	< 1.0
o-Xylene	5	< 5	< 5	< 5	< 5.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5	< 5.0	< 1.0
Total VOCs⁽³⁾		11	32	5.3	1.7	0
Project VOCs⁽⁴⁾		11	31	5.3	1.7	0
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-200-1 12/24/2015	MW-200-1 1/17/2017	MW-201-1 5/1/2009	MW-201-1 12/2/2009	MW-201-1 10/5/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	5.5 J	3.3 J	< 50
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 25	< 50	< 50
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 25	< 50	< 50
1,1-Dichloroethane	5	< 1.0	< 1.0	10 J	9 J	14 J
1,1-Dichloroethene	5	< 1.0	< 1.0	7.9 J	8.1 J	6.9 J
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 25	< 50	< 50
1,2-Dichloropropane	1	< 1.0	< 1.0	< 25	< 50	< 50
2-Butanone	NE	< 10	< 10	< 250	< 500	< 500
2-Hexanone	50	< 5.0	< 5.0	< 250	< 500	< 500
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 250	< 500	< 500
Acetone	NE	< 10	< 10	< 250 B	< 500	< 500
Benzene	1	< 0.50	< 0.50	< 3.5	< 7	< 7
Bromodichloromethane	50	< 1.0	< 1.0	< 25	< 50	< 50
Bromoform	50	< 1.0	< 1.0	< 25	< 50	< 50
Bromomethane	5	< 2.0	< 2.0	< 25	< 50	< 50
Carbon Disulfide	60	< 2.0	< 2.0	< 25	< 50	< 50
Carbon Tetrachloride	5	< 1.0	< 1.0	< 25	< 50	< 50
Chlorobenzene	5	< 1.0	< 1.0	< 25	< 50	< 50
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 25	< 50	< 50
Chloroethane	5	< 1.0	< 1.0	< 25	< 50	< 50
Chloroform	7	< 1.0	< 1.0	< 25	< 50	4.2 J
Chloromethane	5	< 1.0	< 1.0	< 25	R	< 50
cis-1,2-Dichloroethene	5	< 1.0	< 1.0	970 D	1,300	3,900 D
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 25	< 50	< 50
Chlorodibromomethane	50	< 1.0	< 1.0	< 25	< 50	< 50
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 25	< 50	< 50
Ethylbenzene	5	< 1.0	< 1.0	< 25	< 50	< 50
Methyl-Tert-Butylether	5	< 1.0	< 1.0	--	--	< 50
Methylene Chloride	5	< 2.0	< 2.0	< 25	< 50	< 50
Styrene (Monomer)	5	< 1.0	< 1.0	< 25	< 50	< 50
Tetrachloroethene	5	< 1.0	< 1.0	< 25	< 50	< 50
Toluene	5	< 1.0	< 1.0	< 25	< 50	< 50
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	2.7 J	3.5 J	6.7 J
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 25	< 50	< 50
Trichloroethene	5	< 1.0	< 1.0	160	230	72
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 25	< 50	< 50
Vinyl Chloride	2	< 1.0	< 1.0	< 10	38	820
o-Xylene	5	< 1.0	< 1.0	< 25	< 50	7.2 J
m,p-Xylene	5	< 1.0	< 1.0	< 25	< 50	< 50
Total VOCs⁽³⁾		0	0	1,200	1,600	4,800
Project VOCs⁽⁴⁾		0	0	1,200	1,600	4,800
1,4-Dioxane		0.309	0.725	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-201-1 11/3/2011	MW-201-1 10/4/2012	MW-201-1 5/31/2013	MW-201-1 11/20/2014	MW-201-1 12/24/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1-Dichloroethane	5	0.51 J	1.2 J	< 5.0	< 1.0	< 1.0
1,1-Dichloroethene	5	0.21 J	0.65 J	< 5.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 5	< 5	< 5.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5	< 5.0	< 1.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 10	< 10
2-Hexanone	50	< 50	< 50	< 50	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 5.0	< 5.0
Acetone	NE	< 50	< 50	< 50	< 10	< 10
Benzene	1	< 0.7	< 0.7	< 0.70	< 1.0	< 1.0
Bromodichloromethane	50	< 5	< 5	< 5.0	< 1.0	< 1.0
Bromoform	50	< 5	< 5	< 5.0	< 4.0	< 4.0
Bromomethane	5	< 5	< 5	< 5.0	< 2.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chloroform	7	3.2 J	2.9 J	0.49 J	< 1.0	0.43
Chloromethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	61	180 D	7.9	3.9	2
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Ethylbenzene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	0.75 J	0.22 J	< 5.0	< 1.0	< 1.0
Methylene Chloride	5	< 5	< 5	< 5.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5	0.24 J	0.24 J	< 5.0	< 1.0	< 1.0
Toluene	5	< 5 J	< 5	< 5.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	0.59 J	< 5.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	< 1.0
Trichloroethene	5	20	20	13	6.3	2.3
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 2	13	< 2.0	< 1.0	< 1.0
o-Xylene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Total VOCs⁽³⁾		86	220	21	10	4.7
Project VOCs⁽⁴⁾		82	220	21	10	4.3
1,4-Dioxane		--	--	--	--	0.262

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-201-1 1/18/2017	MW-202-1 5/1/2009	MW-202-1 12/2/2009	MW-202-1 10/6/2010	MW-202-1 11/3/2011
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 5	< 5	< 5	0.32 J
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 5	< 5	< 5	< 5
1,1,1,2-Trichloroethane	1	< 1.0	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 1.0	< 5	< 5	< 5	0.86 J
1,1-Dichloroethene	5	< 1.0	< 5	< 5	< 5	0.72 J
1,2-Dichloroethane	0.6	< 1.0	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 1.0	< 5	< 5	< 5	< 5
2-Butanone	NE	< 10	< 50	< 50	< 50	< 50
2-Hexanone	50	< 5.0	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 5.0	< 50	< 50	< 50	< 50
Acetone	NE	< 10	< 50	< 50	< 50	< 50
Benzene	1	< 0.50	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	< 5	< 5	< 5	< 5
Bromoform	50	< 1.0	< 5	< 5	< 5	< 5
Bromomethane	5	< 2.0	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 2.0	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	< 1.0	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 1.0	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5	< 5	0.61 J	0.21 J
Chloroethane	5	< 1.0	< 5	< 5	< 5	< 5
Chloroform	7	< 1.0	6.2	6.7	0.93 J	< 5
Chloromethane	5	< 1.0	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	2.0	0.64 J	0.58 J	< 5	< 5
cis-1,3-Dichloropropene	0.4	< 1.0	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	< 1.0	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 1.0	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	< 1.0	--	--	< 5	0.37 J
Methylene Chloride	5	< 2.0	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	< 1.0	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 1.0	< 5	< 5	0.48 J	0.92 J
Toluene	5	< 1.0	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	< 5	< 5	< 5	< 5
Trichloroethene	5	1.6	7.5	9.3	2.4 J	0.78 J
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5	< 5	0.43 J	0.44 J
Vinyl Chloride	2	< 1.0	< 2	< 2	< 2	< 2
o-Xylene	5	< 1.0	< 5	< 5	< 5	< 5
m,p-Xylene	5	< 1.0	< 5	< 5	< 5	< 5
Total VOCs⁽³⁾		3.6	14	17	5	5
Project VOCs⁽⁴⁾		3.6	8.1	9.9	2.9	3.6
1,4-Dioxane		0.655	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-202-1 10/4/2012	MW-202-1 5/30/2013	MW-202-1 11/19/2014	MW-202-1 (REP) 11/19/2014	MW-202-1 12/30/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	0.74 J	0.93 J	0.70 J	0.69 J	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5	< 5.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	2.1 J	3.0 J	2.4	2.2	< 1.0
1,1-Dichloroethene	5	1.9 J	2.3 J	1.7	1.8	< 1.0
1,2-Dichloroethane	0.6	< 5	< 5.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 50	< 50	< 10	< 10	< 10
2-Hexanone	50	< 50	< 50	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 5.0	< 5.0	< 5.0
Acetone	NE	< 50	< 50	< 10	< 10	< 10
Benzene	1	< 0.7	< 0.70	< 1.0	< 1.0	< 0.50
Bromodichloromethane	50	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 5	< 5.0	< 4.0	< 4.0	< 1.0
Bromomethane	5	< 5	< 5.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 5	< 5.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Chloroform	7	< 5	< 5.0	< 1.0	< 1.0	0.43 J
Chloromethane	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	0.4 J	0.63 J	1.1	1.0	2.0
cis-1,3-Dichloropropene	0.4	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5.0	< 5.0	< 5.0	< 2.0
Ethylbenzene	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 5	< 5.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5	< 5.0	< 5.0	< 5.0	< 1.0
Tetrachloroethene	5	1.7 J	2.8 J	2.3	2.4	< 1.0
Toluene	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	1.2 J	1.6 J	2.1	2.0	2.3
Trichlorotrifluoroethane (Freon 113)	5	0.76 J	1.4 J	1.8 J	1.8 J	< 5.0
Vinyl Chloride	2	< 2	< 2.0	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 5	< 5.0	< 1.0	< 1.0	< 1.0
Total VOCs⁽³⁾		8.8	13	12	12	4.7
Project VOCs⁽⁴⁾		8.0	11	10	10	4.3
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-202-1 12/31/2015	MW-202-1 1/19/2017	MW-203-1 5/1/2009	MW-203-1 12/2/2009	MW-203-1 10/5/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 5	< 5	< 5
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 5	< 5	< 5
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 5	< 5	< 5
1,1-Dichloroethane	5	2.4	0.66 J	< 5	< 5	< 5
1,1-Dichloroethene	5	1.5	0.33 J	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 5	< 5	< 5
1,2-Dichloropropane	1	< 1.0	< 1.0	< 5	< 5	< 5
2-Butanone	NE	< 10	< 10	< 50	< 50	< 50
2-Hexanone	50	< 5.0	< 5.0	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 50	< 50	< 50
Acetone	NE	< 10	< 10	< 50 B	< 50	< 50 B
Benzene	1	< 0.50	< 0.50	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	< 1.0	< 5	< 5	< 5
Bromoform	50	< 1.0	< 1.0	< 5	< 5	< 5
Bromomethane	5	< 2.0	< 2.0	< 5	< 5	< 5
Carbon Disulfide	60	< 2.0	< 2.0	< 5	< 5	< 5
Carbon Tetrachloride	5	< 1.0	< 1.0	< 5	< 5	< 5
Chlorobenzene	5	< 1.0	< 1.0	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	73	17	29
Chloroethane	5	< 1.0	< 1.0	< 5	< 5	< 5
Chloroform	7	< 1.0	< 1.0	7.9	2.6 J	1.5 J
Chloromethane	5	< 1.0	< 1.0	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	1.2	0.45 J	1.6 J	0.83 J	0.97 J
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 5	< 5	< 5
Chlorodibromomethane	50	< 1.0	< 1.0	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 5	< 5	< 5
Ethylbenzene	5	< 1.0	< 1.0	< 5	< 5	< 5
Methyl-Tert-Butylether	5	< 1.0	< 1.0	--	--	0.88 J
Methylene Chloride	5	< 2.0	< 2.0	< 5	< 5	< 5
Styrene (Monomer)	5	< 1.0	< 1.0	< 5	< 5	< 5
Tetrachloroethene	5	2.5	1.3	< 5	< 5	< 5
Toluene	5	< 1.0	< 1.0	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 5	< 5	< 5
Trichloroethene	5	1.3	0.68 J	1.3 J	0.7 J	1.6 J
Trichlorotrifluoroethane (Freon 113)	5	1.1 J	< 5.0	< 5	< 5	< 5
Vinyl Chloride	2	< 1.0	< 1.0	< 2	< 2	< 2
o-Xylene	5	< 1.0	< 1.0	< 5	< 5	< 5
m,p-Xylene	5	< 1.0	< 1.0	< 5	< 5	< 5
Total VOCs⁽³⁾		10	3.4	84	21	34
Project VOCs⁽⁴⁾		8.9	3.4	2.9	1.5	2.6
1,4-Dioxane		0.404	0.396	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-203-1 11/1/2011	MW-203-1 10/3/2012	MW-203-1 (REP) 5/31/2013	MW-203-1 5/31/2013	MW-203-1 11/19/2014
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	0.26 J	< 5.0	0.25 J	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5.0	< 5.0	< 1.0
1,1,1,2-Trichloroethane	1	< 5	< 5	< 5.0	< 5.0	< 1.0
1,1-Dichloroethane	5	0.32 J	1 J	0.98 J	1.1 J	0.60 J
1,1-Dichloroethene	5	< 5	0.44 J	0.47 J	0.46 J	< 1.0
1,2-Dichloroethane	0.6	< 5	< 5	< 5.0	< 5.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5	< 5.0	< 5.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 50	< 10
2-Hexanone	50	< 50	< 50	< 50	< 50	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 5.0
Acetone	NE	< 50	< 50	< 50	< 50	< 10
Benzene	1	< 0.7	< 0.7	< 0.70	< 0.70	< 1.0
Bromodichloromethane	50	< 5	< 5	< 5.0	< 5.0	< 1.0
Bromoform	50	< 5	< 5	< 5.0	< 5.0	< 4.0
Bromomethane	5	< 5	< 5	< 5.0	< 5.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5.0	< 5.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	8.9	3.6 J	3.5 J	3.2 J	< 5.0
Chloroethane	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Chloroform	7	0.68 J	0.36 J	0.28 J	0.27 J	0.34 J
Chloromethane	5	< 5	< 5	< 5.0	< 5.0	< 1.0
cis-1,2-Dichloroethene	5	1.4 J	0.62 J	0.39 J	0.24 J	0.39 J
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 5.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5.0	< 5.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Ethylbenzene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Methyl-Tert-Butylether	5	0.41 J	0.21 J	0.24 J	0.24 J	1.1
Methylene Chloride	5	< 5	< 5	< 5.0	< 5.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5	0.35 J	0.59 J	0.93 J	1.1 J	1.1
Toluene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 5.0	< 1.0
Trichloroethene	5	2.9 J	1.8 J	2.5 J	2.7 J	3.2
Trichlorotrifluoroethane (Freon 113)	5	< 5	1.1 J	1.1 J	1.4 J	< 5.0
Vinyl Chloride	2	< 2	< 2	< 2.0	< 2.0	< 1.0
o-Xylene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5.0	< 5.0	< 1.0
Total VOCs⁽³⁾		15	10	10	11	6.7
Project VOCs⁽⁴⁾		5	4.7	5.3	5.9	5.2
1,4-Dioxane		--	--	--	--	--

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-203-1 12/30/2015	MW-203-1 1/20/2017	MW-204-1 12/24/2015	MW-204-1 1/17/2017	MW-205-1 12/29/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	0.38 J	0.30 J	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0	3.0 J
Acetone	NE	< 10	< 10	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	1.9 J	2.0 J	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	0.32 J	0.27 J	0.50 J	0.24 J	< 1.0
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	0.35 J	0.92 J	2.5	3.4	1.1
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	0.58 J	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	1.2	0.76 J	< 1.0	< 1.0	< 1.0
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	2.5	3.9	4.0	4.1	0.76 J
Trichlorotrifluoroethane (Freon 113)	5	0.56 J	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs⁽³⁾		7.8	8.2	7.0	7.7	4.9
Project VOCs⁽⁴⁾		4.4	5.9	6.5	7.5	1.9
1,4-Dioxane		0.134	0.401	< 0.11	0.350	0.162

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU3 (Former Settling Ponds)
Bethpage, New York^(1,2)

Constitents (units in ug/L)	Sample Location: Sample Date:	MW-205-1 1/18/2017	MW-206-1 12/29/2015	MW-206-1 1/19/2017	MW-208-1 12/29/2015	MW-208-1 1/20/2017
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 1.0	0.27 J	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	0.44 J	0.74 J	2.9	2.1
1,1-Dichloroethene	5	< 1.0	< 1.0	0.27 J	0.89 J	0.70 J
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0	0.35 J
2-Butanone	NE	< 10	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	0.64 J	< 1.0	< 1.0	3.1	2.8
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	0.39 J	0.32 J	0.92 J	546 D	597
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	0.39 J	0.43 J
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	0.45 J	0.56 J	< 1.0	< 1.0
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	0.60 J
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	0.91 J	< 1.0	< 1.0	17.4	10.9
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	6.4	3.3
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs⁽³⁾		1.9	1.2	2.8	580	620
Project VOCs⁽⁴⁾		1.3	1.2	2.8	570	610
1,4-Dioxane		0.366	< 0.10	0.301	0.526	1.02

See Notes and Abbreviations on last page

Table 13
Concentrations of Volatile Organic Compounds and 1,4-Dioxane
in Groundwater Samples Collected from Monitoring Wells,
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Notes and Abbreviations:

- (1) Results are validated at 20% frequency, per protocols specified in Sampling and Analysis Plan in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (ARCADIS 2016).
- (2) Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3 (prior to November 2014) and per USEPA Method 8260C (after November 2014). Samples analyzed for 1,4-Dioxane using USEPA Method 8270D SIM (prior to 2016) and per USEPA Method 522 SIM (starting 2016).
- (3) "Total VOCs" represents the sum of individual concentrations of the VOCs detected. TVOCs were rounded to two significant figures.
- (4) "Project VOCs" represents the sum of individual concentrations of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2-Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene; and Xylenes-o,m, and p.

italicized indicates most recent data

[] Indicates an exceedance of an SCG.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation.
TCL	Target compound list.
VOC	Volatile Organic Compound.
ASP	Analytical services protocol.
SCGs	Standards, criteria, and guidance values.
µg/L	Micrograms per liter.
USEPA	United State Environmental Protection Agency.
SIM	Selective Ion Monitoring
NE	Not established.
E	Concentration for the constituent exceeded the calibration range.
J	Value is estimated.
D	Constituent identified from secondary dilution.
R	Concentration for the constituent was rejected.
B	Compound detected in associated blank sample.
< 5	Compound not detected above its laboratory quantification limit.
REP	Field replicate QA/QC sample
--	Not analyzed

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	B24MW-2	B24MW-3	BCPMW-1	BCPMW-2	BCPMW-3	BCPMW-4-1	BCPMW-4-1	BCPMW-4-1
	Sample Date:	4/23/2009	4/20/2009	4/28/2009	4/28/2009	4/29/2009	4/17/2009	10/4/2010	10/28/2011
	NYSDEC SCGs								
Cadmium, Total		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Cadmium, Dissolved	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium, Total	50	40.3	28.2	20.8	< 10	< 10	22.7	43	25
Chromium, Dissolved	50	< 10	10.6	< 10	< 10	< 10	12.8	41	22
Iron (total)	300	--	597	--	< 100	2,080	103	--	--
Iron (dissolved)	300	--	< 100	--	< 100	1,760	< 100	--	--
Manganese (total)	300	--	16.9	--	12.7	51.4	11.2	--	--
Manganese (dissolved)	300	--	13.7	--	11.3	49.2	< 10	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-4-1	BCPMW-4-1	BCPMW-4-1	BCPMW-4-1	BCPMW-4-1	BCPMW-4-1	BCPMW-4-1	BCPMW-4-2
	Sample Date:	10/3/2012	10/4/2012	6/5/2013	11/17/2014	10/8/2015	12/30/2015	12/28/2016	4/17/2009
	NYSDEC SCGs								
Cadmium, Total		< 5	--	< 5.0	< 3.0	< 3.0	< 3.0	< 3.0	< 5
Cadmium, Dissolved	5	--	< 5	< 5.0	< 3.0	< 3.0	< 3.0	< 3.0	< 5
Chromium, Total	50	32	--	16.1	24.7	24.9	22.7	< 10	10.6
Chromium, Dissolved	50	--	26	13.1	20.7	22.1	19.2	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--	4,630
Iron (dissolved)	300	--	--	--	--	--	--	--	4,080
Manganese (total)	300	--	--	--	--	--	--	--	228
Manganese (dissolved)	300	--	--	--	--	--	--	--	217

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-2 10/7/2010	BCPMW-4-2 10/28/2011	BCPMW-4-2 10/3/2012	BCPMW-4-2 10/4/2012	BCPMW-4-2 6/5/2013	BCPMW-4-2 11/18/2014	BCPMW-4-2 10/8/2015	BCPMW-4-2 12/31/2015
	NYSDEC SCGs								
Cadmium, Total		< 5	< 5	< 5	--	< 5.0	< 3.0	< 3.0	< 3.0
Cadmium, Dissolved	5	--	< 5	--	< 5	< 5.0	< 3.0	< 3.0	< 3.0
Chromium, Total	50	< 10	< 10	< 10	--	< 10	4.1 B	< 10	< 10
Chromium, Dissolved	50	--	< 10	--	< 10	< 10	< 10	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-4-2	BCPMW-4-2 (REP)	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3
	Sample Date:	12/22/2016	12/22/2016	4/17/2009	10/7/2010	10/28/2011	10/3/2012	10/4/2012
	NYSDEC SCGs							
Cadmium, Total		< 3.0	< 3.0	< 5	< 5	< 5	< 5	--
Cadmium, Dissolved	5	< 3.0	< 3.0	< 5	< 5	< 5	--	< 5
Chromium, Total	50	17.3	20.5	< 10	< 10	< 10	< 10	--
Chromium, Dissolved	50	< 10	< 10	< 10	< 10	< 10	--	< 10
Iron (total)	300	--	--	< 100	--	--	--	--
Iron (dissolved)	300	--	--	< 100	--	--	--	--
Manganese (total)	300	--	--	< 10	--	--	--	--
Manganese (dissolved)	300	--	--	< 10	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-4-3	BCPMW-4-3 (REP)	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-4-3	BCPMW-5-1
	Sample Date:	6/5/2013	6/5/2013	11/17/2014	10/9/2015	12/31/2015	12/22/2016	4/23/2009
	NYSDEC SCGs							
Cadmium, Total		< 5.0	< 5.0	< 3.0	< 3.0	< 3.0	< 3.0	< 5
Cadmium, Dissolved	5	< 5.0	< 5.0	< 3.0	< 3.0	< 3.0	< 3.0	< 5
Chromium, Total	50	< 10	< 10	6.8 B	< 10	< 10	11.2	< 10
Chromium, Dissolved	50	< 10	< 10	3.7 B	< 10	< 10	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	7,420
Iron (dissolved)	300	--	--	--	--	--	--	6,370
Manganese (total)	300	--	--	--	--	--	--	145
Manganese (dissolved)	300	--	--	--	--	--	--	131

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1
	Sample Date:	4/20/2009	10/6/2010	10/31/2011	10/3/2012	10/4/2012	6/7/2013	11/11/2014	12/23/2015
	NYSDEC SCGs								
Cadmium, Total		< 5	<5	< 5	< 5	--	< 5.0	< 3.0	< 3.0
Cadmium, Dissolved	5	< 5	<5	< 5	--	< 5	< 5.0	< 3.0	< 3.0
Chromium, Total	50	< 10	< 10	14	< 10	--	< 10	11.6	< 10
Chromium, Dissolved	50	< 10	<10	< 10	--	< 10	< 10	< 10 B	< 10
Iron (total)	300	< 100	--	--	--	--	--	--	--
Iron (dissolved)	300	< 100	--	--	--	--	--	--	--
Manganese (total)	300	< 10	--	--	--	--	--	--	--
Manganese (dissolved)	300	< 10	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-6-1	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2	BCPMW-6-2
	Sample Date:	12/27/2016	5/8/2009	10/6/2010	10/31/2011	10/3/2012	10/4/2012	6/5/2013	11/11/2014
	NYSDEC SCGs								
Cadmium, Total		< 3.0	< 5	<5	<5	< 5	--	< 5.0	< 3.0
Cadmium, Dissolved	5	< 3.0	< 5	<5	<5	--	< 5	< 5.0	< 3.0
Chromium, Total	50	223	10.3	<10	<10	< 10	--	< 10	13.9
Chromium, Dissolved	50	< 10	< 10	<10	<10	--	< 10	< 10	< 10 B
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	BCPMW-6-2	BCPMW-6-2	BCPMW-7-1	BCPMW-7-1	BCPMW-7-1	BCPMW-7-1	BCPMW-7-1	BCPMW-7-1
	Sample Date:	12/23/2015	12/27/2016	4/20/2009	10/7/2010	11/1/2011	10/4/2012	6/7/2013	11/18/2014
	NYSDEC SCGs								
Cadmium, Total		< 3.0	< 3.0	< 5	< 5	< 5	< 5	< 5.0	< 3.0
Cadmium, Dissolved	5	< 3.0	< 3.0	< 5	< 5	< 5	< 5	< 5.0	< 3.0
Chromium, Total	50	< 10	13.5	< 10	< 10	< 10	< 10	< 10	5.1 B
Chromium, Dissolved	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0.90 B
Iron (total)	300	--	--	< 100	--	--	--	--	--
Iron (dissolved)	300	--	--	< 100	--	--	--	--	--
Manganese (total)	300	--	--	106	--	--	--	--	--
Manganese (dissolved)	300	--	--	94.8	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-7-1 12/22/2015	BCPMW-7-1 12/28/2016	MW-200-1 4/29/2009	MW-200-1 10/5/2010	MW-200-1 11/3/2011	MW-200-1 ⁽³⁾ 10/4/2012	MW-200-1 4/15/2013	MW-200-1 5/31/2013
	NYSDEC SCGs								
Cadmium, Total		< 3.0	< 3.0	< 5	< 5	< 5	< 5	--	< 5
Cadmium, Dissolved	5	< 3.0	< 3.0	< 5	< 5	< 5	< 5	--	< 5
Chromium, Total	50	< 10	66.0	< 10	14	48	1,130	86	15.7
Chromium, Dissolved	50	< 10	< 10	< 10	< 10	13	320	21	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	MW-200-1	MW-200-1	MW-200-1	MW-201-1	MW-201-1	MW-201-1	MW-201-1 ⁽³⁾	MW-201-1
	Sample Date:	11/18/2014	12/24/2015	1/17/2017	5/1/2009	10/5/2010	11/3/2011	10/4/2012	4/16/2013
	NYSDEC SCGs								
Cadmium, Total		< 3.0	< 3.0	< 3.0	< 5	< 5	< 5	< 5	--
Cadmium, Dissolved	5	< 3.0	< 3.0	< 3.0	< 5	< 5	< 5	< 5	--
Chromium, Total	50	96.7	54.2	< 10	< 10	< 10	< 10	159	28
Chromium, Dissolved	50	19	29.5	< 10	< 10	< 10	< 10	42	17
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	MW-201-1	MW-201-1	MW-201-1	MW-201-1	MW-202-1	MW-202-1	MW-202-1	MW-202-1 ⁽³⁾
	Sample Date:	5/31/2013	11/20/2014	12/30/2015	1/18/2017	5/1/2009	10/6/2010	11/3/2011	10/4/2012
	NYSDEC SCGs								
Cadmium, Total		< 5	< 3.0	< 3.0	< 3.0	< 5	< 5	< 5	< 5
Cadmium, Dissolved	5	< 5	< 3.0	< 3.0	< 3.0	< 5	< 5	< 5	< 5
Chromium, Total	50	< 10	6.7 B	< 10	< 10	16.5	15	23	263 J
Chromium, Dissolved	50	< 10	1.7 B	< 10	< 10	< 10	< 10	< 10	22
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	MW-202-1	MW-202-1	MW-202-1	MW-202-1(REP)	MW-202-1	MW-202-1	MW-203-1
	Sample Date:	4/16/2013	5/30/2013	11/19/2014	11/19/2014	12/31/2015	1/19/2017	5/1/2009
	NYSDEC SCGs							
Cadmium, Total		--	< 5	< 3.0	< 3.0	< 3.0	< 3.0	< 5
Cadmium, Dissolved	5	--	< 5	< 3.0	< 3.0	< 3.0	< 3.0	< 5
Chromium, Total	50	19	34.3	74.3	83.8	34.9	< 10	31.5
Chromium, Dissolved	50	<10	< 10	2.7 B	2.3 B	< 10	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	MW-203-1	MW-203-1	MW-203-1 ⁽³⁾	MW-203-1	MW-203-1	MW-203-1	MW-203-1(REP)
	Sample Date:	10/5/2010	11/1/2011	10/3/2012	10/4/2012	4/16/2013	5/31/2013	5/31/2013
	NYSDEC SCGs							
Cadmium, Total		< 5	< 5	< 5	--	--	< 5	< 5
Cadmium, Dissolved	5	< 5	< 5	--	< 5	--	< 5	< 5
Chromium, Total	50	31	37	1,600	--	155	29.5	38.2
Chromium, Dissolved	50	< 10	< 10	--	84	<10	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	MW-203-1	MW-203-1	MW-203-1	MW-204-1	MW-204-1	MW-205-1	MW-205-1	MW-206-1
	Sample Date:	11/19/2014	12/20/2015	1/20/2017	12/24/2015	1/17/2017	12/29/2015	1/18/2017	12/29/2015
	NYSDEC SCGs								
Cadmium, Total		< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cadmium, Dissolved	5	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chromium, Total	50	22.9	81.6	< 10	85.3	57.0	11.4	73.4	12.6
Chromium, Dissolved	50	3.3 B	< 10	< 10	38.5	31.1	< 10	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Constituents (units in ug/L)	Sample Location:	MW-206-1	MW-208-1	MW-208-1
	Sample Date:	1/19/2017	12/29/2015	1/20/2017
	NYSDEC SCGs			
Cadmium, Total		< 3.0	< 3.0	< 3.0
Cadmium, Dissolved	5	< 3.0	< 3.0	< 3.0
Chromium, Total	50	162	< 10	< 10
Chromium, Dissolved	50	< 10	< 10	< 10
Iron (total)	300	--		--
Iron (dissolved)	300	--		--
Manganese (total)	300	--		--
Manganese (dissolved)	300	--		--

Notes and Abbreviations on last page

Table 14
Concentrations of Metals in Groundwater Samples Collected
from Monitoring Wells, Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds),
Bethpage, New York ^(1,2)

Notes:

- (1) Results are validated at 20% frequency, per protocols specified in Sampling and Analysis Plan in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (ARCADIS 2016).
- (2) Samples analyzed for metals using USEPA Method 6010.
- (3) Samples collected with HydraSleeve™ no purge method, all other samples collected by purge (3-Volume) method.

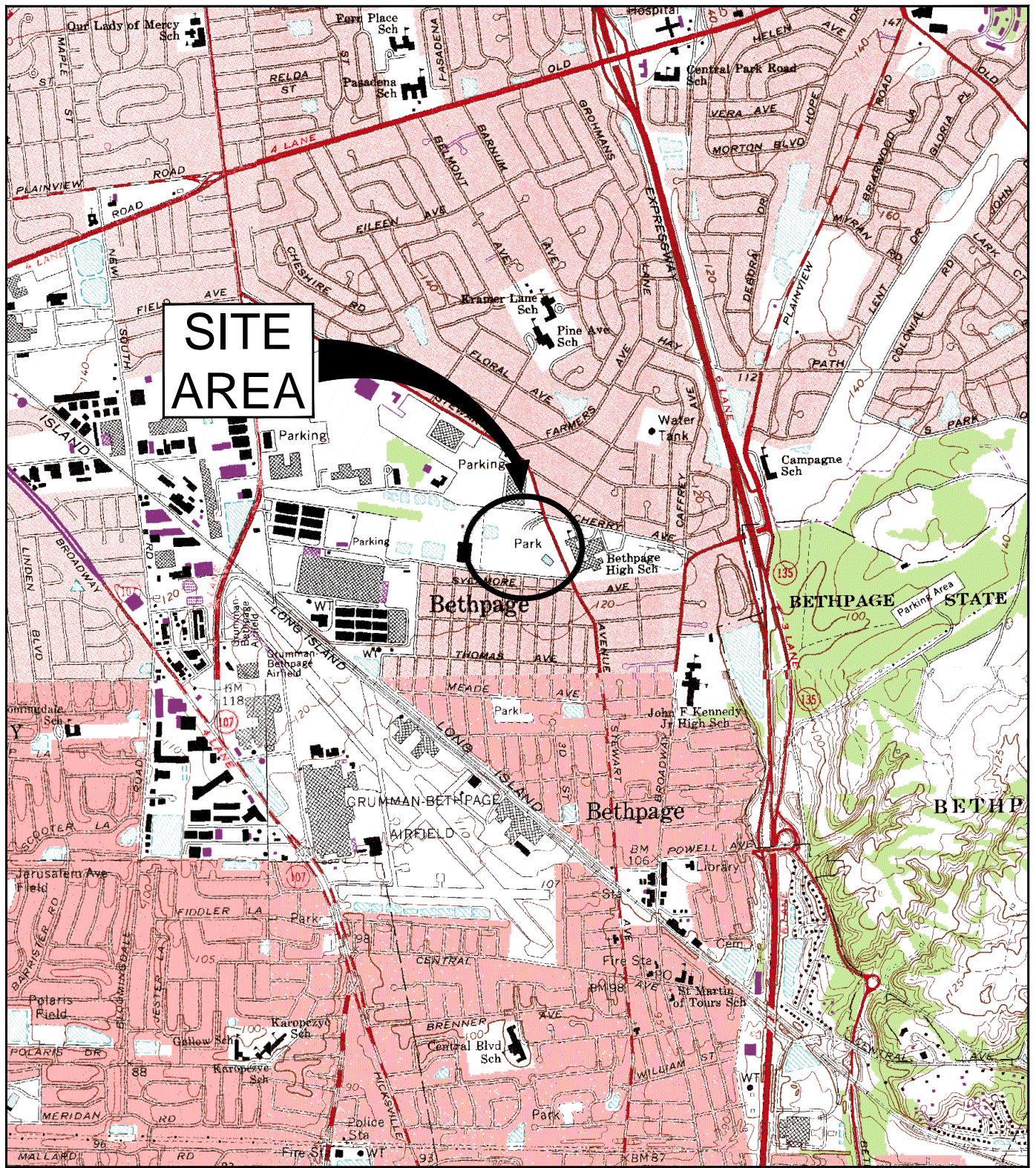
italicized indicates most recent data

	Indicates an exceedance of an SCG.
Bold	Indicates a detection.
NYSDEC	New York State Department of Environmental Conservation.
USEPA	United State Environmental Protection Agency.
SCGs	Standards, criteria, and guidance values.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5	Compound not detected above its laboratory quantification limit.
B	Compound detected in associated blank sample.
J	Value is estimated.

FIGURES



CITY:SYRACUSE,NY DIV:GROUP:ENV DB:A.SANCHEZ LD: PIC:(Op) PM:(Reop) TM:(Op) LVR:(Op)ON:"OFF"-REF: G:\ENV\CAD\STRACUSE\ACT\1001496114\DOMINANT\1496_BUI.dwg LAYOUT: BETHPAGE PARK. SAVED: 11/11/2015 4:51 PM ACADVER: 19.1.S (LMS TECH) PAGES: 19. PAGESETUP: PLOTSTYLETABLE: PLOTTED: 11/11/2015 4:54 PM BY: STOWELL,GARY



SOURCE: USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, N.Y., 1994, FREEPORT QUADRANGLE, FREEPORT, N.Y., 1994, HICKSVILLE QUADRANGLE, HICKSVILLE, N.Y., 1967, PHOTOREVISED 1979, HUNTINGTON, N.Y., 1967, PHOTOREVISED 1979



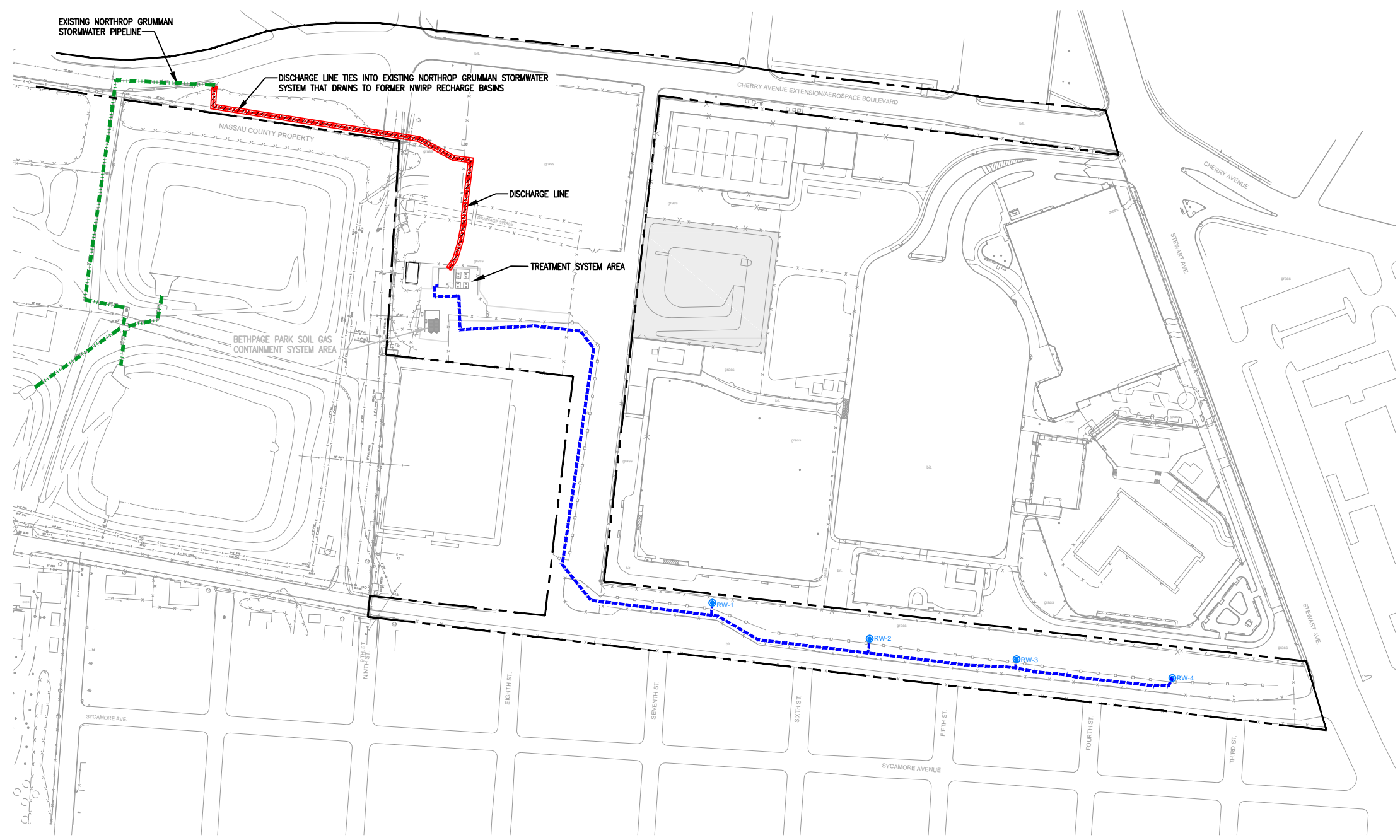
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE LOCATION



FIGURE
1

CITY:SYRACUSE-NY DIV:GROUP:ENV DBA:SANCHEZ LD:AS PIC:(Op) PM:(Rep) TM:(Op) LVR:(Op)N="OFF=REF" G:\ENVCAD\SYRACUSE\ACT\NY00498\1410MM\41NY1498B01.DWG LAYOUT:2. SAVED: 11/11/2015 4:26 PM. ACADVER: 19.1S (LMS TECH) PAGES: 19. PLOTSTYLETABLE: ... PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY XREFS: IMAGES: PROJECTNAME: ...



LEGEND:

- NORTHROP GRUMMAN PROPERTY LINE
- FENCE
- BITUMINOUS PAVEMENT
- INFLOW PIPELINE AND ELECTRICAL CONDUITS
- EFFLUENT PIPELINE
- EXISTING NORTHROP GRUMMAN STORMWATER PIPELINE
- REMEDIAL WELL
- NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NOW OWNED BY NASSAU COUNTY)

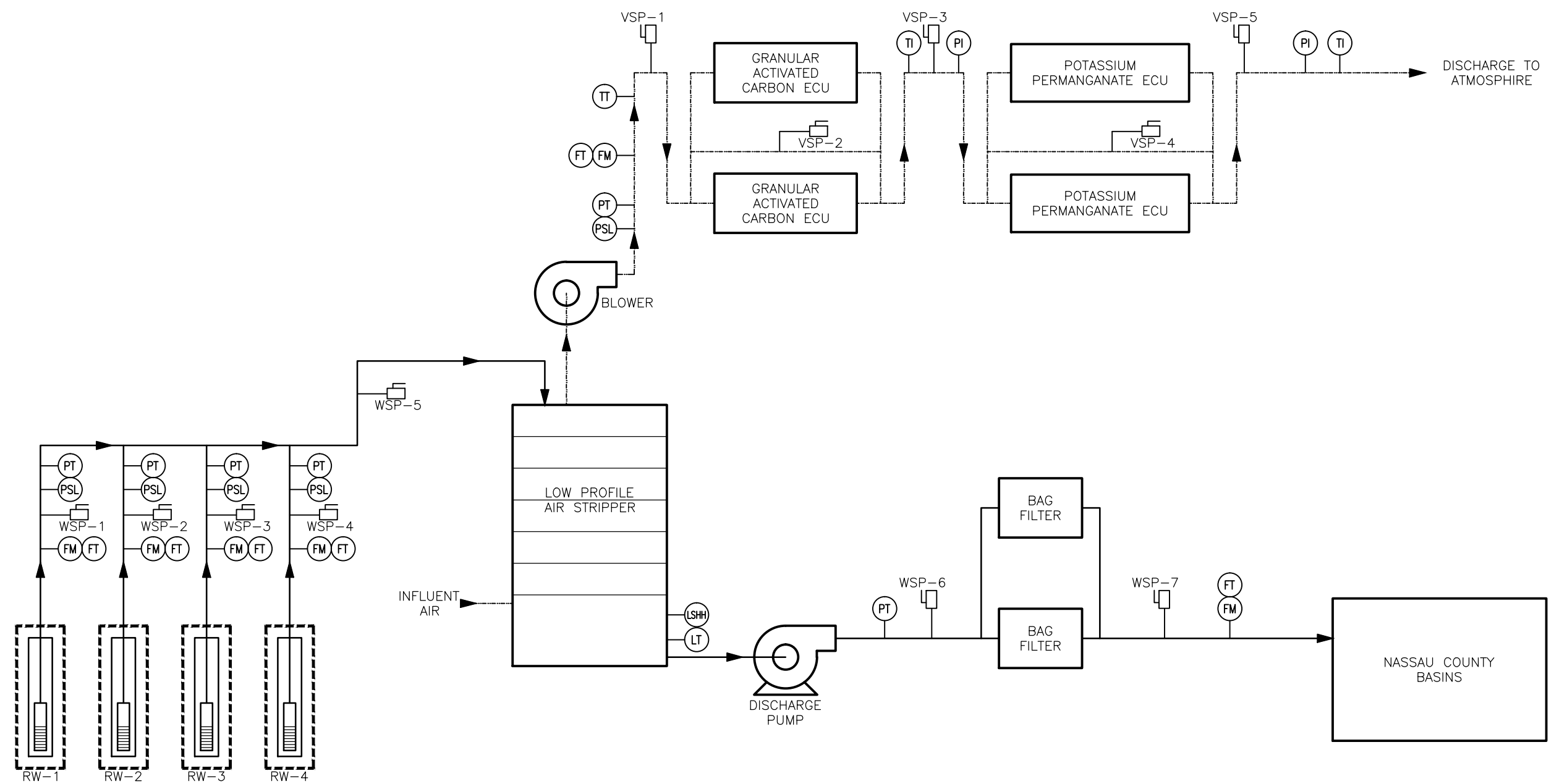


BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**SITE AND
GROUNDWATER CONTAINMENT SYSTEM**



CITY:SYRACUSE,NY DIV:GROUPENV DB:A,SANCHEZ LD:AS PIC:(Opt) PM:(Ref) LVR:(OPTION+)-OFF=-REF.
 \arcadis-us.com\office\data\Syracuse-NY\ENVCAD\SYRACUSE\ACTN\001496114\OMM\IN\NY1496D02.dwg LAYOUT: 3 SAVED: 11/11/2015 2:57 PM ACADVER: 19.1S (LMS TECH) PAGES: 3 PLOTSTYLETABLE: ... PLOTSETUP: ... PLOTTED: 5/13/2016 12:13 PM BY: HARRIS, JESSICA
 XREFS: IMAGES: PROJECTNAME: ...



- LEGEND:**
- PROCESS WATER
 - - - PROCESS AIR
 - (FM) INSTRUMENT
 - SAMPLE PORT
 - ▶ FLOW DIRECTION
 - FM FLOW METER
 - FT FLOW RATE TRANSMITTER
 - PSL PRESSURE SWITCH LOW
 - PT PRESSURE TRANSMITTER
 - PI PRESSURE INDICATOR
 - LSHH LEVEL SWITCH HIGH HIGH
 - LT LEVEL TRANSMITTER
 - TT TEMPERATURE TRANSMITTER
 - TI TEMPERATURE INDICATOR
 - WSP WATER SAMPLE PORT
 - VSP VAPOR SAMPLE PORT
 - ECU EMISSION CONTROL UNIT

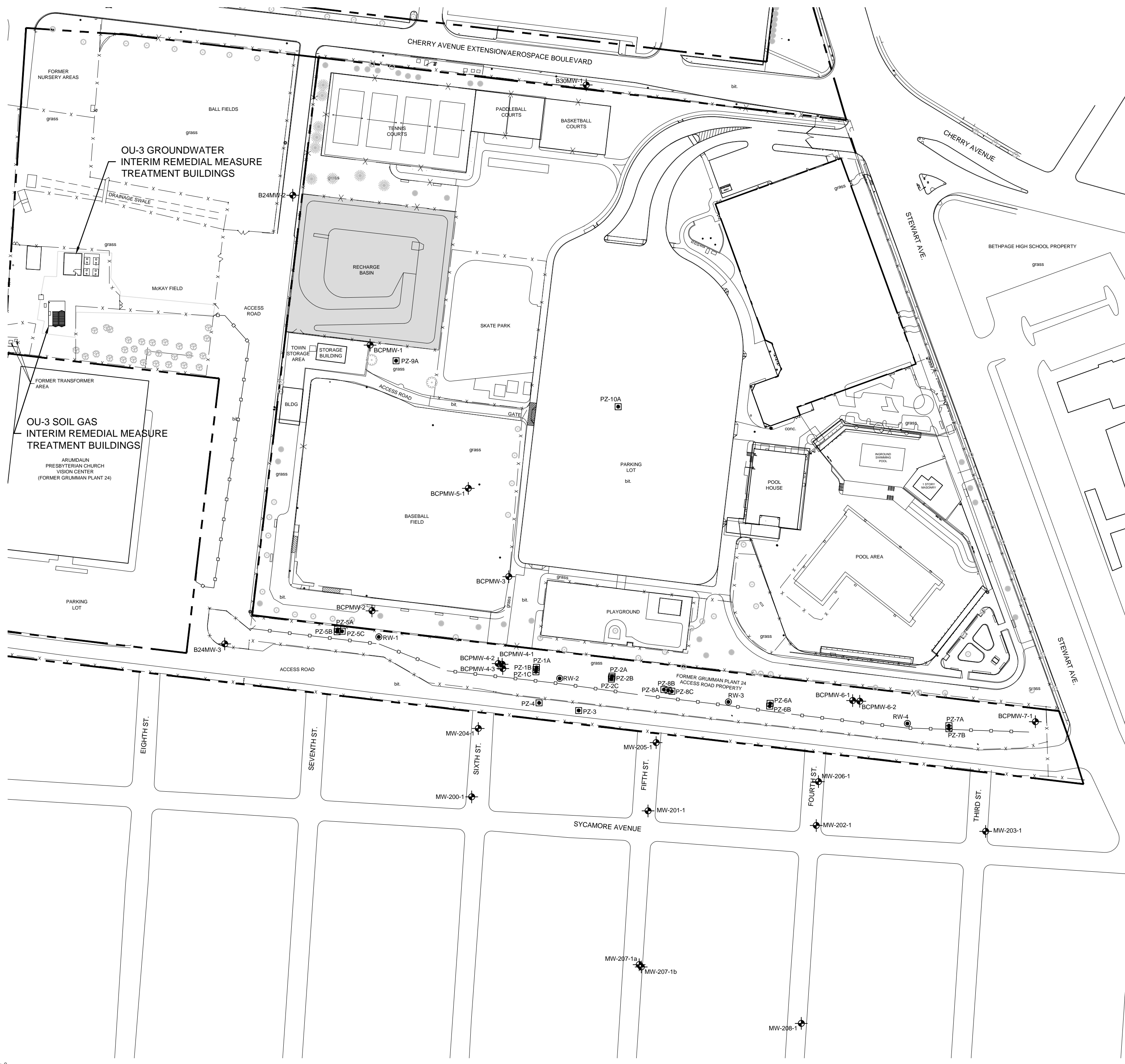
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
 OPERABLE UNIT 3
 (FORMER GRUMMAN SETTLING PONDS)
 BETHPAGE, NEW YORK

**GROUNDWATER TREATMENT SYSTEM
 PROCESS SCHEMATIC AND
 MONITORING LOCATIONS**

ARCADIS Design & Consultancy
 for natural and built assets

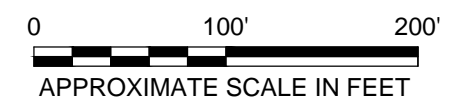
FIGURE
3

CITY: SYRACUSE; ANY: D:\GROUPE\ENV: DBA\SANCHEZ: LDALS: PIC:000: L:\R:\00\0\0\0\0\OFF\REF: Z:\ENV\CA\SYRACUSE\ACT\N\000\480\146\BPT\11\08\BPT11\08\BPT11.dwg: LAYOUT: 4: SAVED: 3/16/2017 3:54 PM: ACADVER: 19: 18: LMS TECH: PAGES: 21: PLOTTED: 3/16/2017 5:26 PM: BY: SANCHEZ, ADRIAN



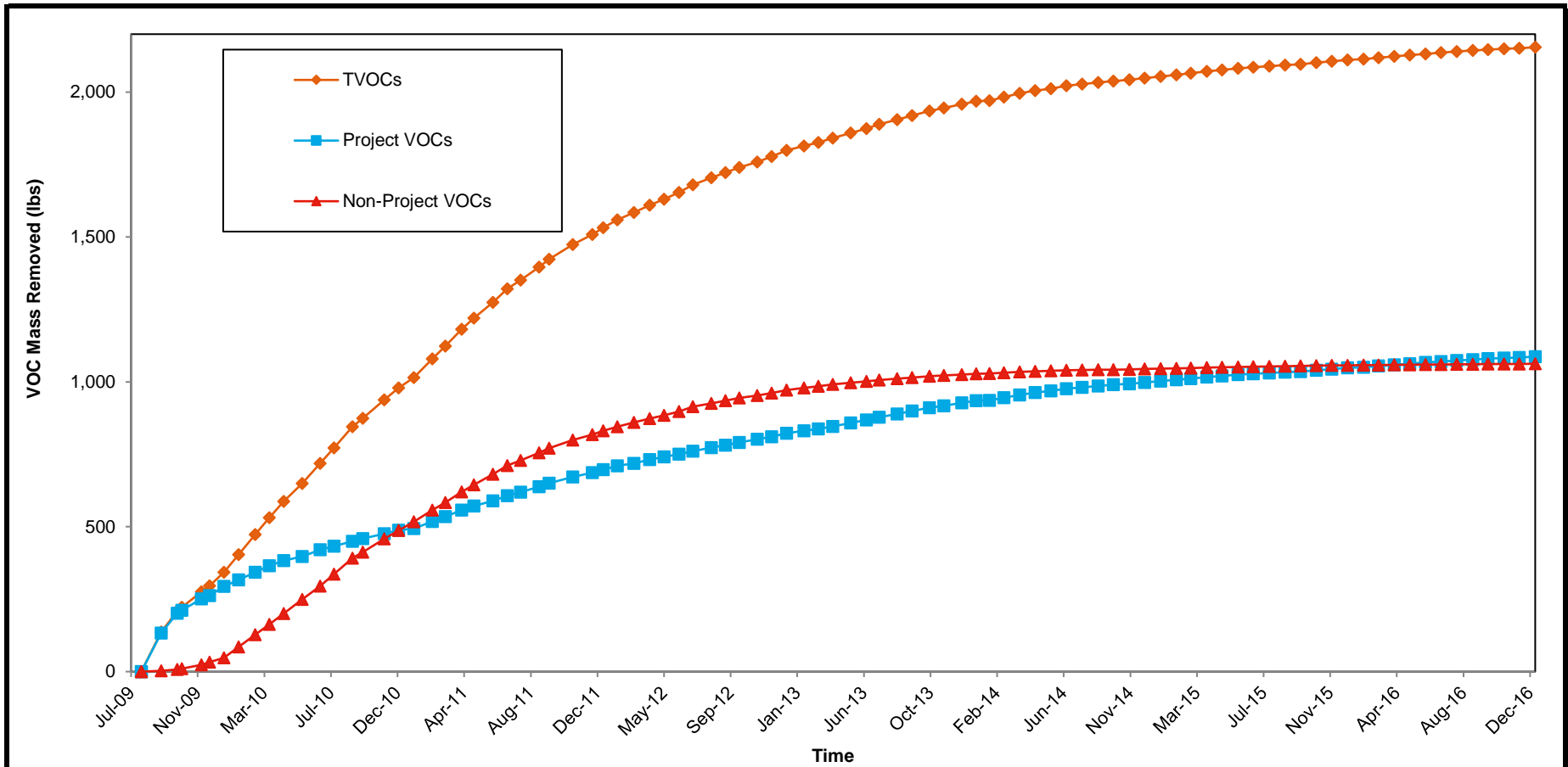
- EXPLANATION:**
- NORTHROP GRUMMAN PROPERTY LINE
 - FENCE
 - BASIN
 - BITUMINOUS PAVEMENT
 - MW-200-1 MONITORING WELL
 - RW-2 REMEDIAL WELL
 - PZ-2C PIEZOMETER

- NOTES:**
- MONITORING WELLS, REMEDIAL WELLS, AND PIEZOMETERS SURVEYED TO NORTH AMERICAN DATUM (NAD) 83.
 - PARK FEATURES SHOWN WERE PRESENT PRIOR TO TOWN OF OYSTER BAY REDEVELOPMENT IN 2005.



BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**GROUNDWATER MONITORING NETWORK
SITE PLAN**



Notes:


VOC = volatile organic compound

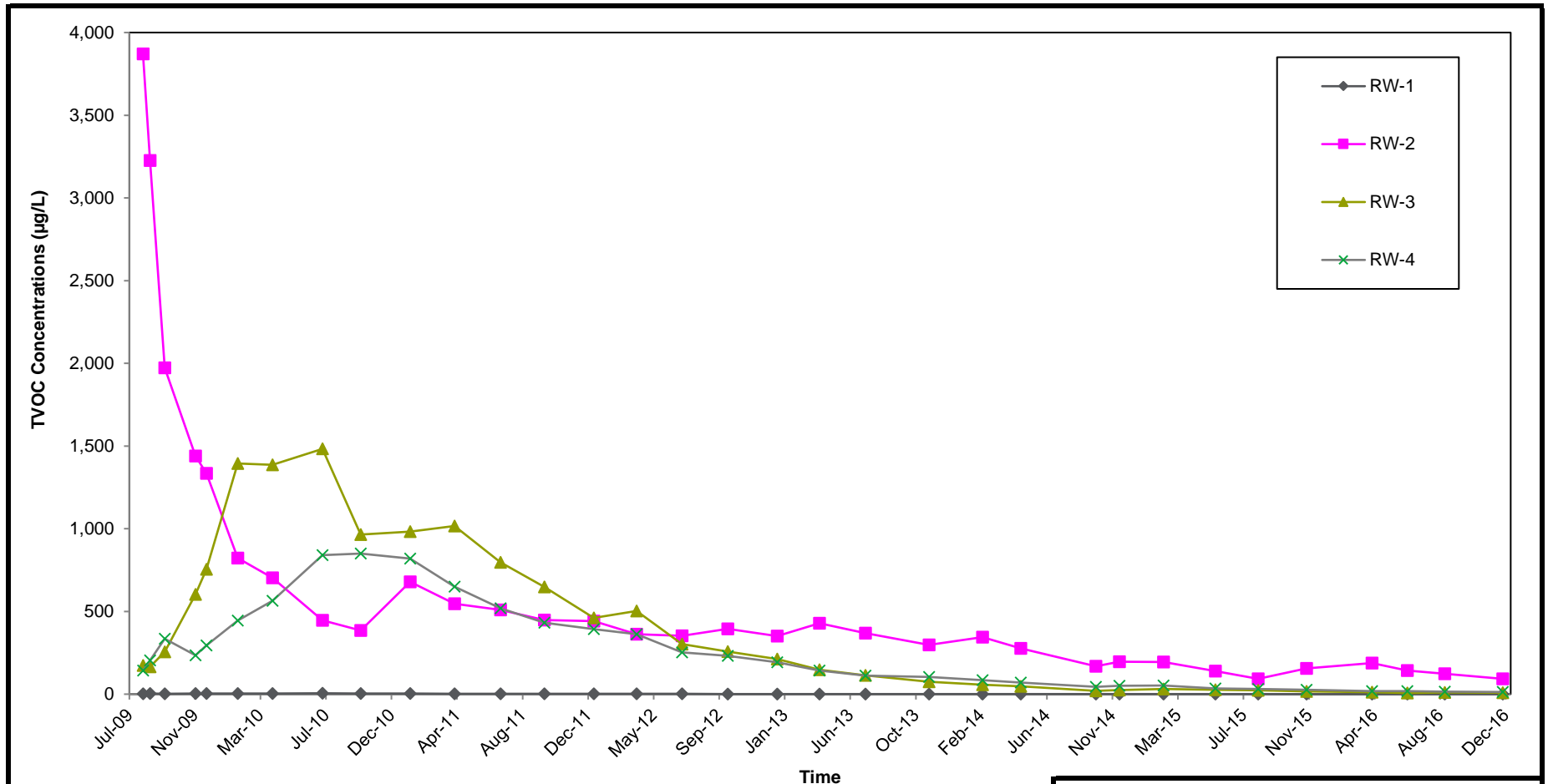
lbs = pounds

TVOCs = total VOCs detected

Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.

Non-Project VOCs = sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM, OPERABLE UNIT 3 (FORMER GRUMMAN SETTLING PONDS) BETHPAGE, NEW YORK	
CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT VOC MASS REMOVED THROUGH DECEMBER 2016	
	FIGURE 5



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter

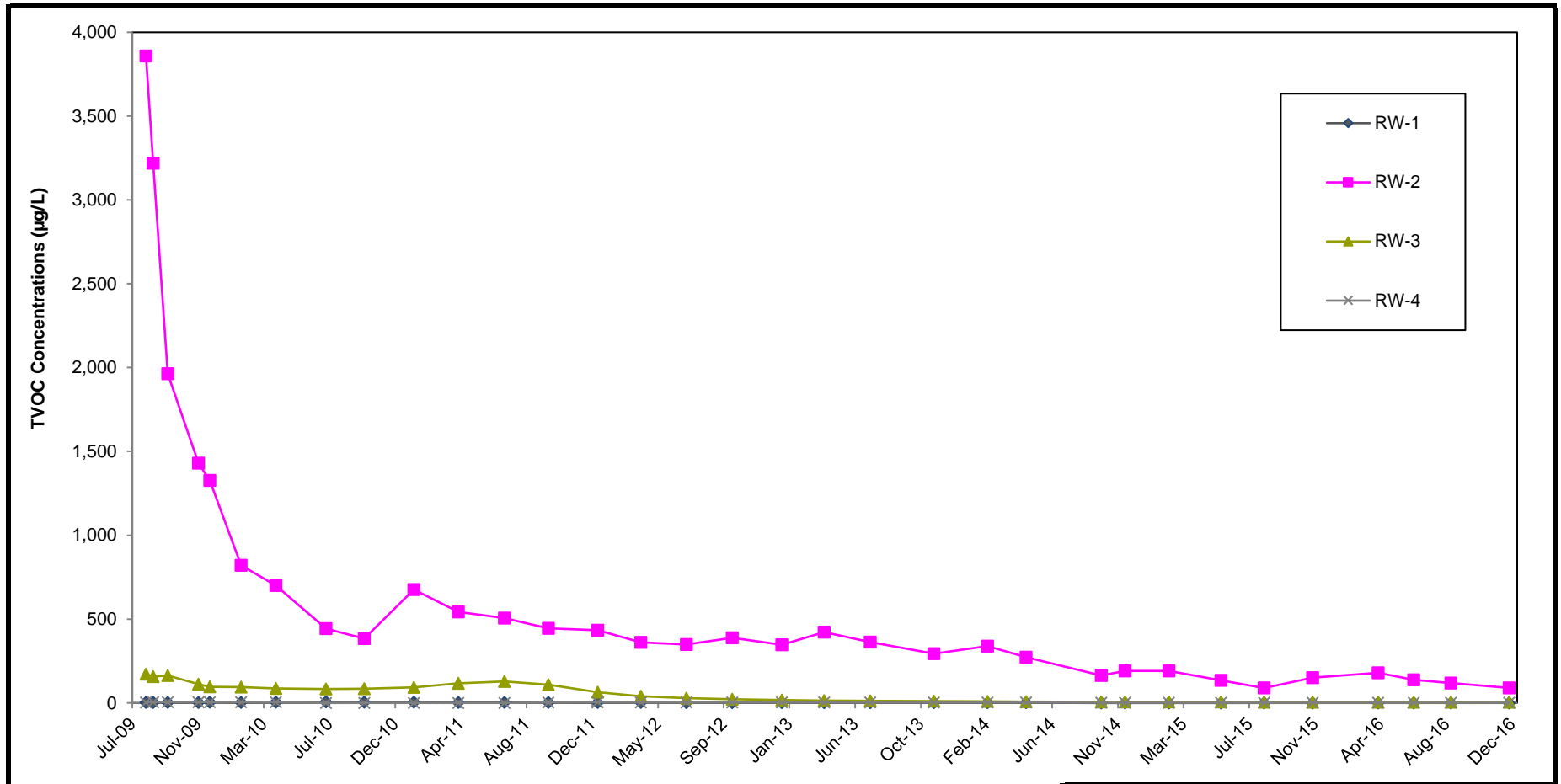
TVOCs = total VOCs detected

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**REMEDIAL WELL TOTAL VOC
CONCENTRATIONS THROUGH
DECEMBER 2016**



**FIGURE
6A**



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter

TVOCs = total VOCs detected

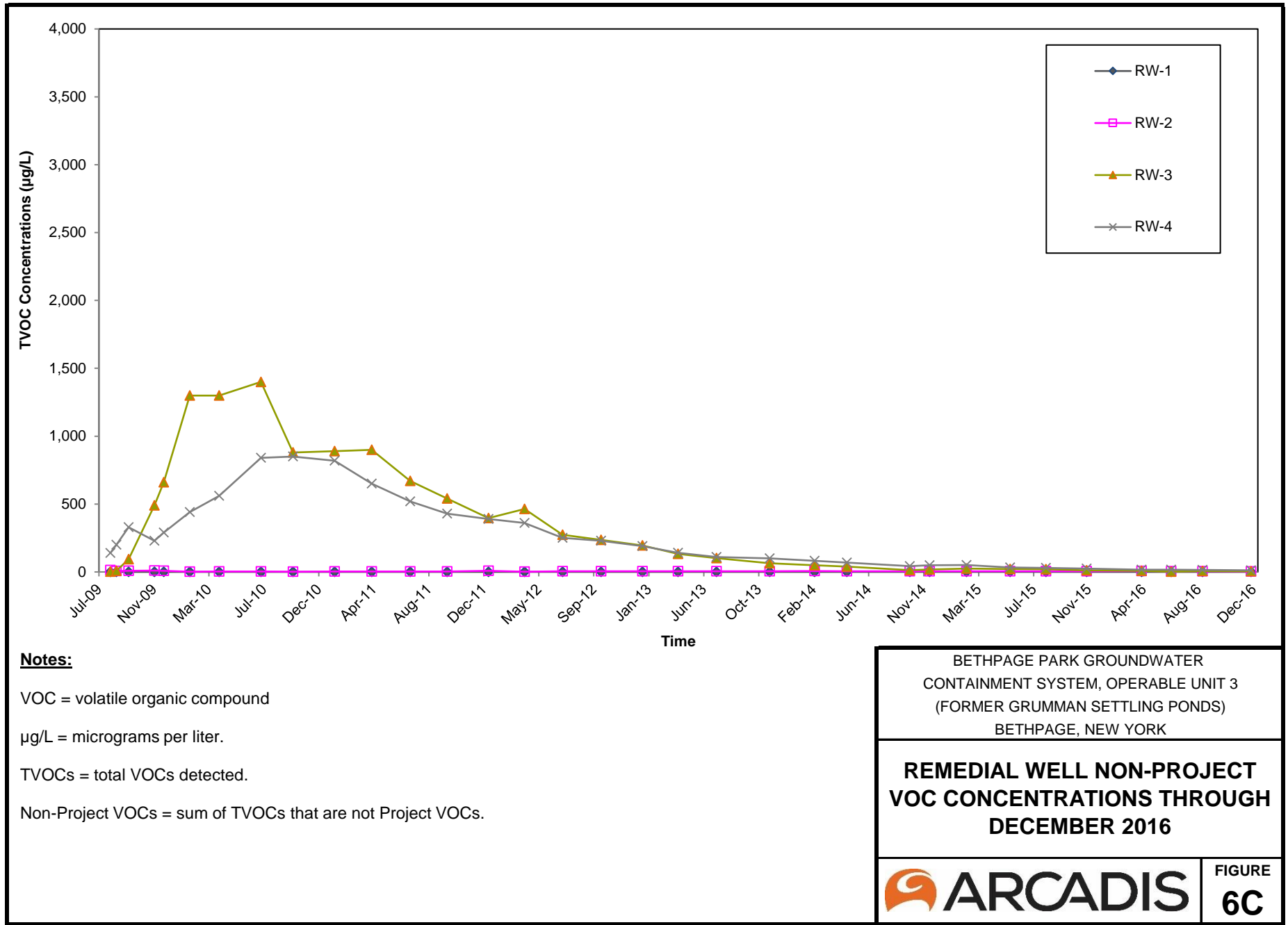
Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene and total xylenes.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**REMEDIAL WELL PROJECT VOC
CONCENTRATIONS THROUGH
DECEMBER 2016**



FIGURE
6B



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter.

TVOCs = total VOCs detected.

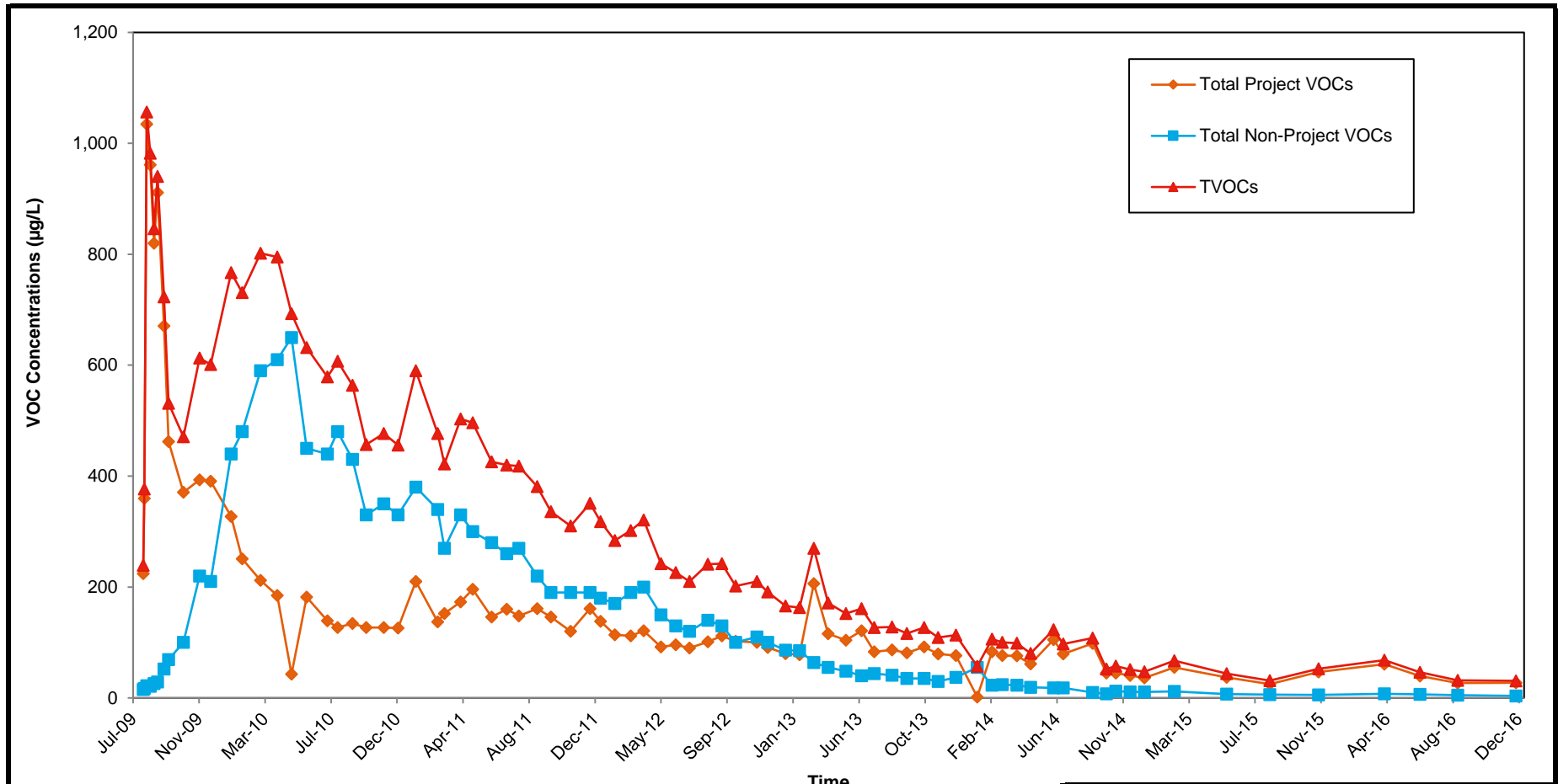
Non-Project VOCs = sum of TVOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**REMEDIAL WELL NON-PROJECT
VOC CONCENTRATIONS THROUGH
DECEMBER 2016**



FIGURE
6C



Notes:

VOC = volatile organic compound

µg/L = micrograms per liter

TVOCs = total VOCs detected.

Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.

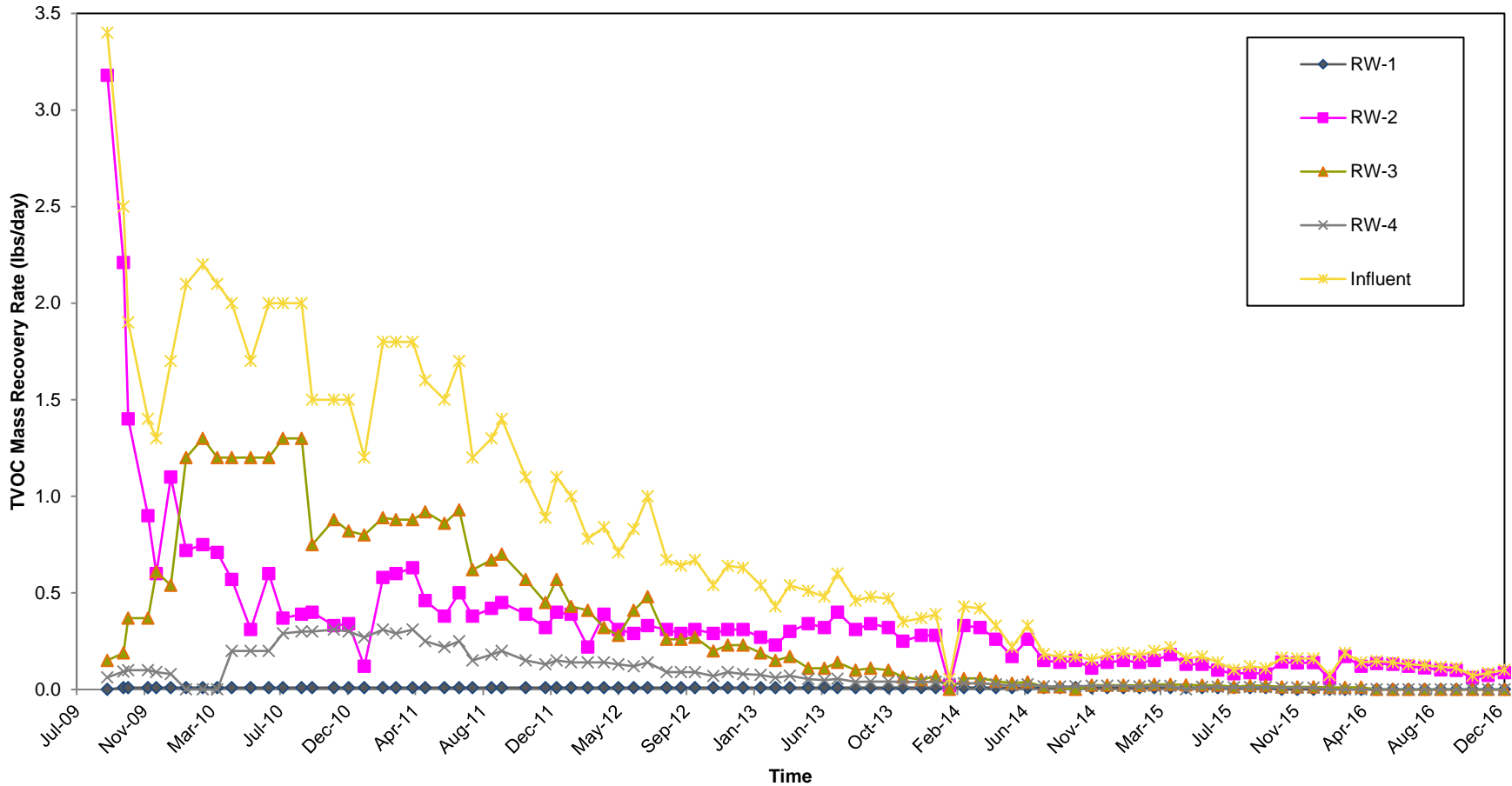
Non-Project VOCs = sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**INFLUENT TOTAL, PROJECT
AND NON-PROJECT
VOC CONCENTRATIONS
THROUGH DECEMBER 2016**

 **ARCADIS**

FIGURE
7



Notes:

VOC = volatile organic compound

lbs/day = pounds per day

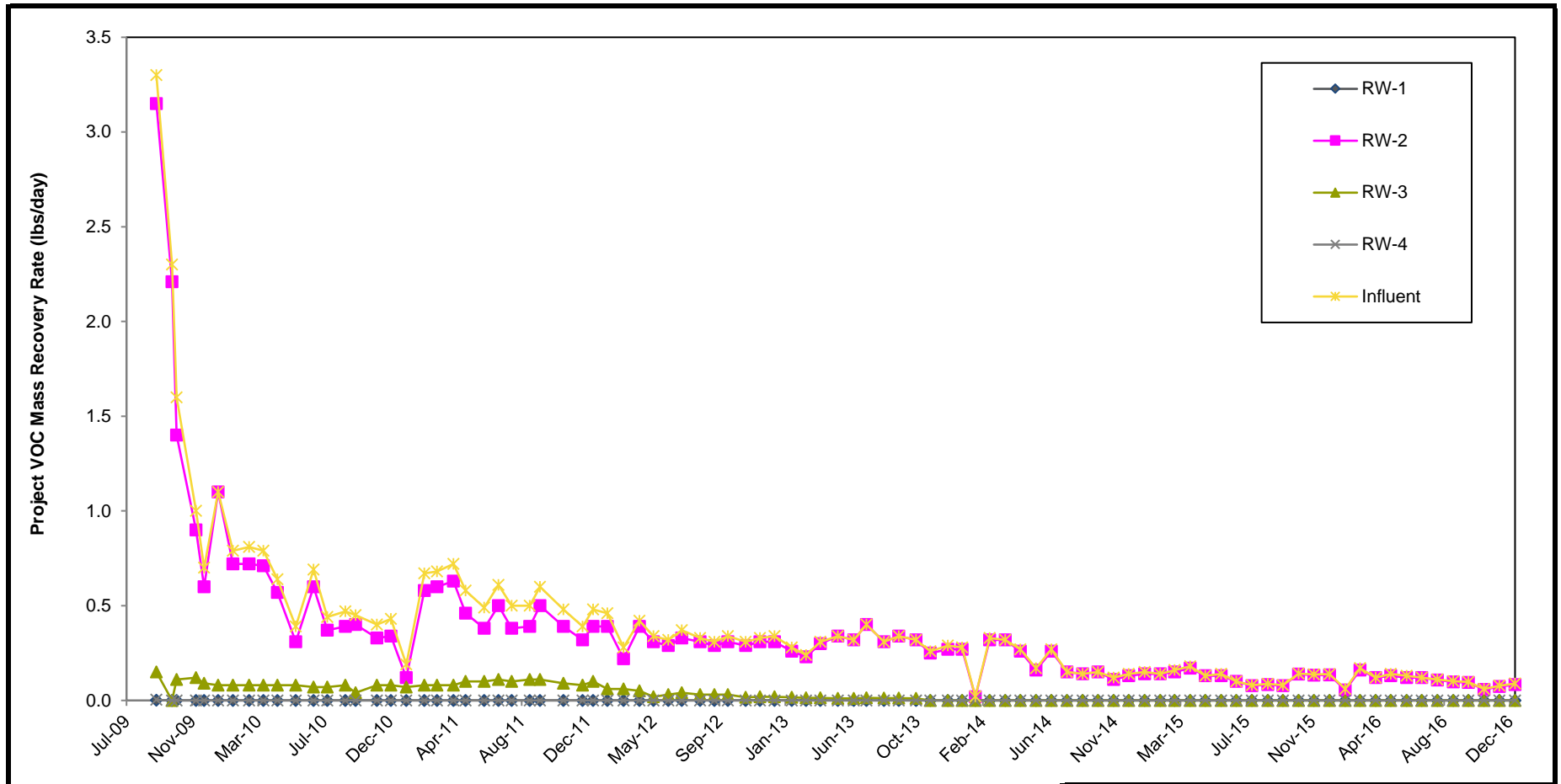
TVOCs = total VOCs detected

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**TOTAL VOC MASS RECOVERY
RATES THROUGH
DECEMBER 2016**



FIGURE
8A



Notes:

VOC = volatile organic compound

lbs/day = pounds per day.

Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes

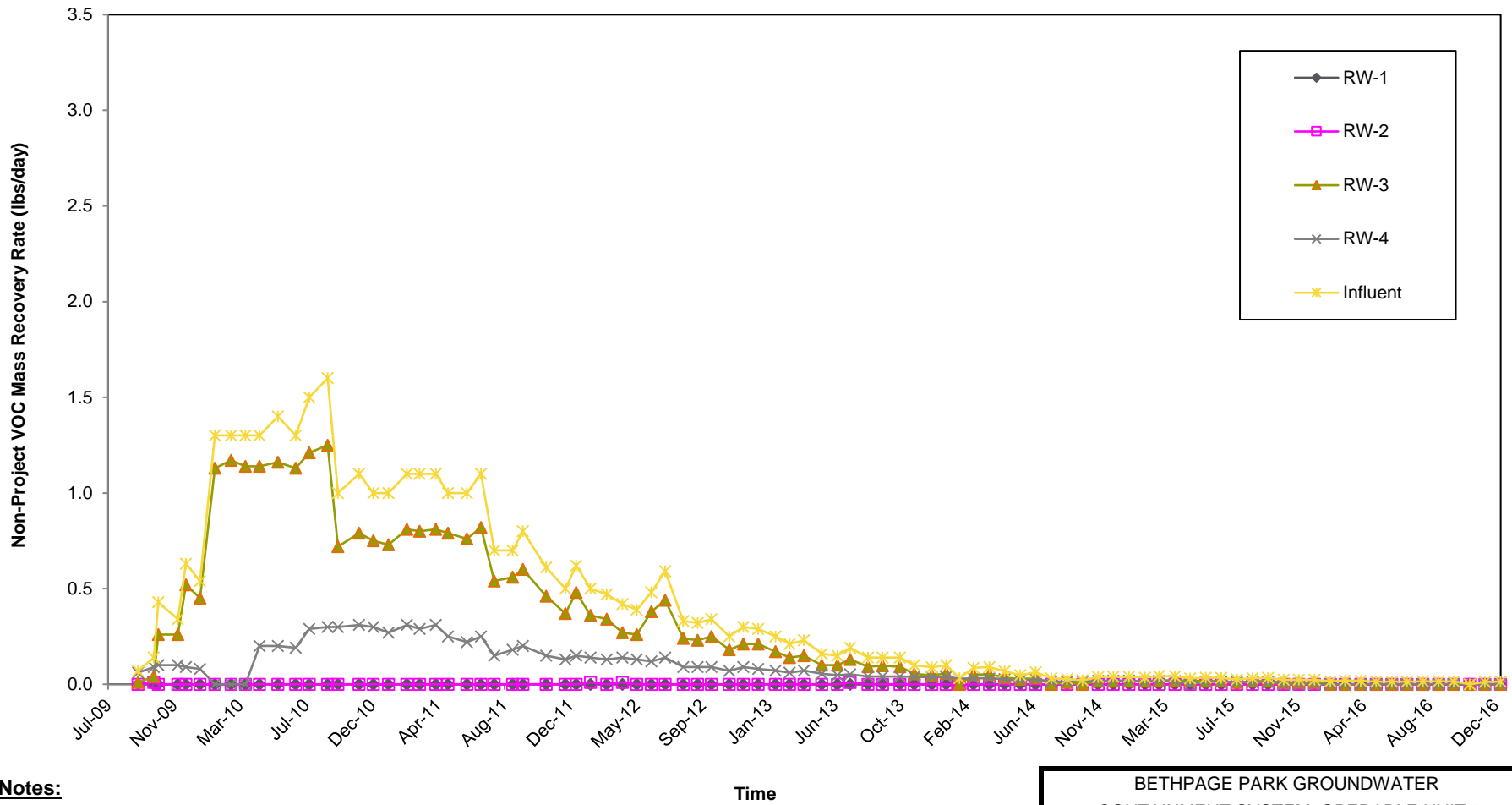
Time

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**PROJECT VOC MASS RECOVERY
RATES THROUGH
DECEMBER 2016**



FIGURE
8B



Notes:


VOC = volatile organic compound

lbs/day = pounds per day

Non-Project VOCs = sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

**NON-PROJECT VOC MASS
RECOVERY RATES THROUGH
DECEMBER 2016**



**FIGURE
8C**

APPENDIX A

Well Construction Information and Environmental Effectiveness Monitoring Program



Appendix A-1
Well Construction Information and Environmental Effectiveness Monitoring Program, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds) Northrop Grumman systems Corporation, Bethpage, New York ^(1,2)

Well ID	Well Diameter (inches)	Depth to Screen		Screen Length (ft)	Well Depth (ft)	Well Materials	Water Levels ⁽³⁾	Monitoring Activity		
		Top (ft bls)	Bottom (ft bls)					Water Quality ⁽⁴⁾		
								VOC	Cd/Cr	Fe/Mn
Monitoring Wells										
BCPMW-1	2	50	65	15	65	Sch. 40 PVC	Quarterly	Baseline	Baseline	--
BCPMW-2	2	60	75	15	75	Sch. 40 PVC	Quarterly	Baseline	Baseline	Baseline
BCPMW-3	2	59	74	15	74	Sch. 40 PVC	Quarterly	Baseline	Baseline	Baseline
BCPMW-4-1	4	45	65	20	70	Sch. 40 PVC	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	Baseline
BCPMW-4-2	4	68.5	83.5	15	88.5	Sch. 40 PVC	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	Baseline
BCPMW-4-3	4	115	125	10	130	Sch. 40 PVC	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	Baseline
BCPMW-5-1	4	50	65	15	70	Sch. 80 PVC/SS	Quarterly	Baseline	Baseline	Baseline
BCPMW-6-1	4	88.5	98.5	10	103.5	Sch. 40 PVC	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
BCPMW-6-2	4	133	143	10	148	Sch. 40 PVC	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
BCPMW-7-1	4	90	100	10	105	Sch. 40 PVC	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
B24MW-2	2	54	74	20	74	PVC	Quarterly	Baseline/Annual	Baseline	--
B24MW-3	2	55	70	15	70	PVC	Quarterly	Baseline/Annual	Baseline	--
B30MW-1	2	57	72	15	72	PVC	Quarterly	Baseline/Annual	Baseline	--
MW-200-1	4	85	95	10	100	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
MW-201-1	4	70	80	10	85	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
MW-202-1	4	125	135	10	140	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
MW-203-1	4	103	113	10	118	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual ⁽⁵⁾	Baseline/Annual	--
Remedial Wells ⁽⁶⁾										
RW-01	8	108	128	20	134	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--
RW-02	6	84	104	20	104	Steel/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--
RW-03	8	84	104	20	107	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--
RW-04	8	110	130	20	133	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--

Appendix A-1
Well Construction Information and Environmental Effectiveness Monitoring Program, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds) Northrop Grumman systems Corporation, Bethpage, New York ^(1,2)

Well ID	Well Diameter (inches)	Depth to Screen		Screen Length (ft)	Well Depth (ft)	Well Materials	Water Levels ⁽³⁾	Monitoring Activity		
		Top (ft bls)	Bottom (ft bls)					Water Quality ⁽⁴⁾		
								VOC	Cd/Cr	Fe/Mn
Piezometers										
PZ-01a	2	60	65	5	68	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-01b	1	80	85	5	88	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-01c	1	130	135	5	138	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-02a	2	60	65	5	68	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-02b	1	80	85	5	85	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-02c	1	130	135	5	138	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-03	1	80	85	5	88	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-04	1	80	85	5	88	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-05a	2	65	70	5	74	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-05b	1	110	115	5	117	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-06a	2	65	70	5	72	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-06b	1	90	95	5	97	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-07a	2	65	70	5	72	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-07b	1	113	118	5	120	Sch. 40 PVC/SS	Quarterly	--	--	--

Notes:

- (1) Water samples will be collected and analyzed in accordance with the method and procedures described in the Sampling and Analysis Plan (SAP).
- (2) Approximate locations of the wells and piezometers in the OU3 Bethpage Park Groundwater Containment System are shown in Figure 4. Water levels will be measured in all wells/piezometers during the baseline monitoring event. Water levels will be measured in accordance with the procedures presented in the SAP.
- (3) VOC: VOC analyses per NYSDEC ASP 2005, Method OLM 4.3 (prior to September 1, 2014) and per USEPA Method 8260C (after September 1, 2014).
Cd/Cr: Cadmium and Chromium using USEPA Method 6010C.
Fe/Mn: Iron and Manganese using USEPA Method 6010C, both total and dissolved.
- (5) Semiannual wells will be monitored annually after Year 1.
- (6) Some of the analyses listed here are also covered in the Remedial System Sampling Program (Table B-1) and some of the analyses and/or frequencies may be modified based on review of short-term and/or long-term testing results. (e.g. the Cd/Cr sampling frequency was changed from quarterly to annually in 2011).

Acronyms\Key:

Sch. 80 PVC	Schedule 80 polyvinyl chloride.	ft bls	Feet below land surface.
Sch. 40 PVC	schedule 40 polyvinyl chloride.	--	Not applicable.
SS	Stainless steel.	VOC	Volatile organic compound.
Steel	Low carbon steel.	NYSDEC	New York State Department of Environmental Conservation
ft	Feet.	USEPA	United States Environmental Protection Agency
ft ms	Feet relative to mean sea level.		

APPENDIX B

Compliance and Performance Program



Sample Location/Instrument ⁽¹⁾	Parameter (Method) ⁽²⁾	Frequency			
		Short-Term ⁽³⁾		Long-Term ⁽⁴⁾	SCADA Data Acquisition
		(first month)	(five month period following first month)		
<u>Water Samples</u> ⁽⁵⁾					
Remedial Well 1 (WSP-1)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C) ⁽¹¹⁾		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Remedial Well 2 (WSP-2)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C) ⁽¹¹⁾		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Remedial Well 3 (WSP-3)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C) ⁽¹¹⁾		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Remedial Well 4 (WSP-4)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C) ⁽¹¹⁾		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Air Stripper Influent (WSP-5)	VOCs (USEPA Method 8260C)	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Quarterly	NA
	Iron (USEPA 6010C)	1-hr ⁽⁶⁾ ; Days 1, 3, & Weekly	Monthly	Quarterly	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Air Stripper Effluent (WSP-6)	Iron (USEPA 6010C)	1-hr ⁽⁶⁾ ; As Needed	As Needed	As Needed	NA
Plant Effluent (WSP-7)	VOCs (USEPA Method 8260C)	1-hr ⁽⁶⁾; Days 1, 3, & Weekly	Monthly	Monthly	NA
	Iron (USEPA 6010C)	1-hr ⁽⁶⁾; Days 1, 3, & Weekly	Monthly	Monthly	NA
	Mercury (USEPA 7470A) ⁽⁷⁾	1-hr ⁽⁶⁾; Days 1, 3, & Weekly	Monthly	Monthly	NA
	1,4-Dioxane (USEPA Method B8270)	1-hr ⁽⁶⁾; Days 1, 3, & Weekly	Monthly	Monthly	NA
	pH (field) ⁽⁸⁾ and	1-hr ⁽⁶⁾; Days 1, 3, & Weekly	Monthly	Monthly	NA
<u>Air Samples</u> ^{(9) (10)}					
Air Stripper Effluent/ECU-1 Influent (VSP-1)	VOCs (TO-15 Modified)	Monthly	Monthly	Quarterly	NA
ECU-1 Effluent/ECU-2 Influent (VSP-2)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
ECU-2 Effluent/ECU-3 Influent (VSP-3)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
ECU-3 Effluent/ECU-4 Influent (VSP-4)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
Total Effluent (VSP-5)	VOCs (TO-15 Modified)	Monthly	Monthly	Quarterly	NA

See notes on last page.

Sample Location/Instrument ⁽¹⁾	Parameter (Method) ⁽²⁾	Frequency			
		Short-Term ⁽³⁾		Long-Term ⁽⁴⁾	SCADA Data Acquisition
		(first month)	(five month period following first month)		
<u>Water Flow Measurements</u>					
Remedial Well RW-1 (FT - 110)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-2 (FT - 120)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-3 (FT - 130)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-4 (FT - 140)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Combined Influent (FR - 200)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
System Effluent (FT-700)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
<u>Air Flow Measurements</u>					
Air Stripper Effluent (FT-500)	Flow rate (SCFM)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
<u>Water Pressure Measurements</u>					
Remedial Well RW-1 (PT - 110)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-2 (PT - 120)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-3 (PT - 130)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-4 (PT - 140)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Air Stripper Effluent (PT-700)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
<u>Air Temperature & Relatively Humidity Measurements</u>					
Air Stripper Effluent (TT-500)	Temperature	Weekly	Weekly	Weekly	Continuously
ECU Mid-Train (TI-503)	Temperature	Weekly	Weekly	Weekly	NA
Effluent (TI-603)	Temperature	Weekly	Weekly	Weekly	NA
<u>Air Pressure Measurements</u>					
Air Stripper Effluent (PT-500)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	Continuously
ECU #1 Influent (PI-501)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
ECU #2 Influent (PI-502)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
ECU #3 Influent (PI-601)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
ECU #4 Influent (PI-602)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
System Effluent (PI-603)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA

See notes on last page.

Notes:

- (1) Refer to Figure 3 of this Operation, Maintenance, & Monitoring (OM&M) Report and Appendix E of the Groundwater IRM OM&M Manual (OM&M Manual (ARCADIS 2009)) for a diagram showing referenced sample locations and measurement points.
- (2) Parameters/methods may be modified based on review of short-term and/or long-term testing results. Parameters shown in **Bold** indicate parameters that require NYSDEC notification/approval prior to change in monitoring schedule.
- (3) Short-term schedule is tentative. Modification may be required/recommended based on the results of start-up and performance testing.
- (4) Long-term schedule is tentative. Modification may be required/recommended based on the results of short-term testing or water quality trends.
- (5) Water samples will be collected in accordance with the methods described in the Sampling and Analysis Plan, which is included as Appendix A of the OM&M Manual (ARCADIS 2009). Samples will be analyzed in accordance with the methods and procedures described in the Sampling and Analysis Plan.
- (6) Per NYSDEC request, a 1-hr pilot test was performed during system shake-down. The 1-hr pilot test samples were also analyzed for Mercury (Hg).
- (7) Per the interim treated effluent (water) discharge criteria provided in the NYSDEC letter dated March 19, 2009, select samples were analyzed for Mercury (Hg).
- (8) As authorized by the NYSDEC, the pH monitoring frequency was reduced from weekly to monthly beginning on February 8, 2010.
- (9) Air samples collected and analyzed in accordance with methods described in the Sampling and Analysis Plan, which is included as Appendix A of the OM&M Manual (ARCADIS 2009).
- (10) Additional air samples will be collected to help calculate media usage rates and to help determine media changeout frequencies.
- (11) Cadmium and Chromium analyses are part of the Environmental Effectiveness Monitoring Program (Table A-1) and the original discharge permit application. They are included here for consistency.

Acronyms/Key:

NA	Not Applicable.
---	Not Required
ECU	Emissions control unit.
VOCs	Volatile organic compounds (refer Tables D-3 and D-5 in the Quality Assurance Project Plan (QAPP) (Appendix D of the OM&M Manual (ARCADIS 2009)) for the analyte lists for aqueous and air samples, respectively).
gal.	Gallons.
gpm	Gallons per minute.
i.w.g.	Inches water gauge.
NYSDEC	New York State Department of Environmental Conservation.
EPA	U.S. Environmental Protection Agency.
SCADA	Supervisory Control And Data Acquisition.
OM&M	Operation, maintenance and monitoring.

Arcadis of New York, Inc.

Two Huntington Quadrangle

Suite 1S10

Melville, New York 11747

Tel 631 249 7600

Fax 631 249 7610

www.arcadis.com

