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Operation, Maintenance, and Monitoring Report for the Bethpage Park Soil Gas Containment System

2014 Five Year Periodic Review Report

Northrop Grumman Systems Corporation
Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York
NYSDEC ID # 1-30-003A

March 2015

ARCADIS

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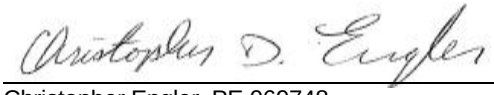

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Date:
March 31, 2015

Tables

Soil Gas Containment System, Northrop Grumman Systems Corporation, Bethpage, New York

Figures

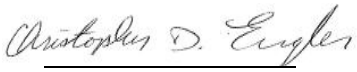
Appendices

Certification

Statement of Certification

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

(a) The engineering control employed for the Operable Unit 3 Bethpage Park Soil Gas Containment System is unchanged from the date the control was put in place, or last approved by the Division of Environmental Remediation;
(b) Nothing has occurred that would impair the ability of such control to protect public health and the environment;
(c) Nothing has occurred that would constitute a violation or failure to comply with any operation, maintenance, or monitoring plan for this control, and;
(d) Access to the Operable Unit 3 Bethpage Park Soil Gas Containment System will continue to be provided to the Division of Environmental Remediation to evaluate the remedy, including access to evaluate the continued maintenance of this control.



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Executive Summary

This Five Year Periodic Review Report (Review) summarizes and certifies the operation, maintenance, and monitoring (OM&M) activities conducted from 2008 to 2014 (i.e., February, 2008 to December 31, 2014) ["the review period"] for the Operable Unit 3 (OU3) Bethpage Park Soil Gas Containment System (BPSGCS) that mitigates the off-site migration of soil gas along the Plant 24 Access Road and the McKay Field Access Road. The review period includes 2008 as this is the first Review for the system and includes all system data since startup. This Review also satisfies the requirement for the OU3 BPSGCS 2014 Annual Summary Report, as it includes data collected during 2014.

Site Overview

The present-day Bethpage Community Park property, the Grumman Plant 24 Access Road, and McKay Field 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", or "Site". The Site Location, including adjacent streets and properties, is shown on Figure 1 and the site features are shown on Figure 2 (Site Plan).

The BPSGCS (previously referred to as the Soil Gas Interim Remedial Measure [IRM]) has been operational since February 18, 2008 in accordance with the Soil Gas IRM Work Plan (ARCADIS 2007a) and the 95% design report (ARCADIS 2007b).

The remedial action objectives of the BPSGCS are as follows:

- To mitigate the off-site migration of Project VOCs in the on-site soil gas through the implementation of a soil gas containment system installed along the Plant 24 Access Road and McKay Field Access Road, south and west of the Park, respectively, and;

- To comply with applicable NYSDEC Standards, Criteria, and Guidelines (SCGs)

The compliance objectives of the BPSGCS are as follows:

- To mitigate the off-site migration of soil gas, the system was designed to maintain -0.1 inch of water column (iwc) within a negative pressure curtain established along the Plant 24 Access Road and along the McKay Field Access Road, from

the boundary of the Plant 24 Access Road to approximately 400 feet north along the MacKay Field Access Road, based on a 12-month rolling average.

- To collect and treat vapors until it is demonstrated that all VOCs in the influent (untreated) vapor stream are present at concentrations lower than the NYSDEC Division of Air Resources Guide-1 (DAR-1) Annual Guidance Concentrations (AGCs) on a 12-month rolling average and Short-Term Guidance Concentrations (SGCs) for any given grab sample (NYSDEC 2014).

- To collect and transfer condensate to the Nassau County Department of Public Works (NCDPW) sanitary sewer, in accordance with the requirements set forth by the NCDPW (NCDPW 2007, 2008) or dispose off-site at a NYSDEC-permitted disposal facility.

Effectiveness of the OU3 BPSGCS

The following conclusions are provided about the performance and ability of the OU3 BPSGS to comply with the remedial action and compliance objectives for the Site:

- The BPSGCS generally operated as designed during the review period to mitigate the off-site migration of soil gas.
    - The BPSGCS operated continuously with the exception of brief shutdown periods for routine and non-routine maintenance (approximately 98% uptime).
    - Approximately 274 pounds of VOC-impacted soil gas were removed from the subsurface.
    - A vacuum of -0.1 iwc or greater was maintained within the majority of induced vacuum monitoring points based on a 12-month rolling average (Table 3). While several wells have had periodic issues throughout the review period maintaining the -0.1 iwc at the well heads, the issues causing the reduced vacuums have been corrected and will continue to be proactively managed through more frequent condensate removal.

- The operation of the BPSGCS complied with applicable NYSDEC SCGs during the review period.

- Effluent vapor emissions met applicable AGC and SGC air discharge criteria.

- Condensate was disposed in accordance with applicable NCDPW requirements or disposed off-site at a NYSDEC-permitted facility.

Compliance with OM&M Manual and Associated Plans

Requirements of the OU3 BPSGCS OM&M Manual (ARCADIS 2009a) were met during the reporting period in terms of operation and maintenance.

1. Introduction

Pursuant to the Administrative Order on Consent (AOC) Index # W1-0018-04-01 (NYSDEC 2005), ARCADIS of New York, Inc. (ARCADIS), on behalf of Northrop Grumman Systems Corporation (Northrop Grumman), has prepared this Operable Unit 3 (OU3) Bethpage Park Soil Gas Containment System (BPSGCS) Five Year Periodic Review Report (Review) for submittal to the New York State Department of Environmental Conservation (NYSDEC). The present-day Bethpage Community Park property, the Grumman Plant 24 Access Road, and McKay Field 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", or "Site". A Site location map is provided as Figure 1 and identifies the Site Area.

The BPSGCS (previously referred to as the Soil Gas Interim Remedial Measure [IRM]) has been operational since February 18, 2008 in accordance with the Soil Gas IRM Work Plan (ARCADIS 2007a) and the 95% design reports (ARCADIS 2007b). This Review summarizes and certifies the BPSGCS activities conducted for the OU3 BPSGCS and the monitoring of associated media and remedial technologies used at the Site from 2008 to 2014 (i.e., February 2008 to December 31, 2014 [the "review period"]). This Review also satisfies the requirement for the OU3 BPSGCS 2014 Annual Summary Report, including reporting of data collected, system alarms documented, conclusions drawn, and recommendations made for the BPSGCS during 2014 (i.e., from January 1, 2014 through December 31, 2014). Detailed OM&M summaries for the previous six operational annual reports (i.e., 2008 through 2014) are available in the following reports:

- 2008 Annual Summary Report of the Operable Unit 3 Operation, Maintenance and Monitoring, March 31, 2009 (ARCADIS 2009b).
- 2009 Annual Summary Report of the Operable Unit 3 Operation, Maintenance, and Monitoring, February 26, 2010 (ARCADIS 2010);
- 2010 Annual Summary Report of the Operation, Maintenance, and Monitoring for the Soil Gas Interim Remedial Measure, February 25, 2011 (ARCADIS 2011a);
- 2011 Annual Summary of the Operation, Maintenance, and Monitoring for the Soil Gas Interim Remedial Measure, February 24, 2012 (ARCADIS 2012);

- 2012 Annual Summary of the Operation, Maintenance, and Monitoring for the Soil Gas Interim Remedial Measure, March 1, 2013 (ARCADIS 2013);

- 2013 Annual Summary of the Operation, Maintenance, and Monitoring for the Soil Gas Interim Remedial Measure, February 25, 2014 (ARCADIS 2014a).

Additionally, this Review summarizes the OM&M activities performed during the fourth quarter of 2014 (i.e., October 1 through December 31, 2014). Detailed OM&M summaries for the previous three 2014 operational quarterly reports are available in the following 2014 Quarterly Reports:

- Quarterly OM&M Report for the Bethpage Park Soil Gas Containment System, March 2014 (ARCADIS 2014b)

- Quarterly OM&M Report for the Bethpage Park Soil Gas Containment System, June 2014 (ARCADIS 2014c)

- Quarterly OM&M Report for the Bethpage Park Soil Gas Containment System, September 2014 (ARCADIS 2014d)

During 2014, the BPSGCS system OM&M was conducted in accordance with the NYSDEC-approved OU3 Soil Gas IRM OM&M Manual (ARCADIS 2009a) and the NYSDEC-approved Sampling and Analysis Plan (SAP) (ARCADIS 2008).

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

- Project VOCs: VOCs that may be related to former Northrop Grumman historical activities. For this report, Project VOCs include 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: VOCs, such as Freon 12 and Freon 22, which are understood to be unrelated to former Northrop Grumman activities but have been detected in the Site Area. As noted in the Site Area RI Report (ARCADIS 2011), a

groundwater sub-plume of Freon 22 has been identified originating from the area of the Town of Oyster Bay's (Town's) former ice rink. Based on Town information (Zervos 2007), Freon 22 was used by the Town and released to the environment.

2. Site Overview

This section provides a brief description of the Site, relevant history as it relates to the OU3 BPSGCS, main features/components of the OU3 BPSGCS, and describes the goals of the BPSGCS.

2.1 Description of Site

The Site is bordered by Aerospace Boulevard/Cherry Avenue Extension and the Robert Plan Company Building to the north, Stewart Avenue and Bethpage High School to the east, the Plant 24 Access Road and residential areas to the south, and the Plant 24 Access Road, the Arumdaun Presbyterian Church Vision Center (the former Northrop Grumman Plant 24) and U.S. Navy Recharge Basins to the west. Other properties currently owned by Northrop Grumman, including the McKay Field property, ball fields, and former nursery area are located to the west. The Site location, including adjacent streets and properties, is shown on Figure 1. The present-day Bethpage Community Park is owned and operated by the Town. The Park property is approximately 18 acres, and is located adjacent to the northeast portion of the Northrop Grumman Bethpage Facility (Figure 1). The site features are shown on Figure 2 (Site Plan).

Adjoining the Park property to the south is the Plant 24 Access Road, which is a partially asphalt-paved/partially grassed area that runs east-west along the Park southern boundary and McKay Field Access Road which is an asphalt paved road that runs north-south along the Park western boundary. Stewart Avenue is a Nassau County-owned roadway that abuts the Site to the east.

2.2 Nature and Extent of Impacted Soil Gas

This section provides an overview of the nature and extent of impacted soil gas detected beneath and in the vicinity of the Park and the Town's former ice rink. Soil gas sampling conducted as part of the OU3 Site Area Remedial Investigation Report (Site Area RI Report, ARCADIS 2011b) for the above sites indicates that previous historical activities at the Park and releases at the Town's former ice rink have resulted in impacts to soil gas in the vadose zone with shallow (i.e., less than 10 feet [ft] below

land surface [bls]) and deep (i.e., greater than 34 ft bls) impacts in the south/southwest portion of the Park.

The Site Area RI Report describes and depicts the overall extent of soil gas impacts prior to remediation, which included on-site and off-site VOC-impacted soil gas. The predominant Project VOC (trichloroethylene) was used to approximate the distribution of Project VOCs in the vadose zone and Freons 12 and 22 were used to show the distribution of Non-project VOCs in the vadose zone.

2.3 Goals of the BPSGCS

The remedial action objectives of the BPSGCS are as follows:

- To mitigate the off-site migration of Project VOCs in the on-site soil gas through the implementation of a soil gas containment system installed along the Plant 24 Access Road and McKay Field Access Road, south and west of the Park, respectively, and;

- To comply with applicable NYSDEC Standards, Criteria, and Guidelines (SCGs)

The compliance objectives of the BPSGCS are as follows:

- To mitigate the off-site migration of soil gas, the system was designed to maintain -0.1 inch of water column (iwc) within a negative pressure curtain established along the Plant 24 Access Road and along the McKay Field Access Road, from the boundary of the Plant 24 Access Road to approximately 400 feet north along the MacKay Field Access Road, based on a 12-month rolling average.

- To collect and treat extracted vapors until it is demonstrated that all VOCs in the influent (untreated) vapor stream are present at concentrations lower than the NYSDEC Division of Air Resources Guide-1 (DAR-1) Annual Guidance Concentrations (AGCs) on a 12-month rolling average and Short-Term Guidance Concentrations (SGCs) for any given grab sample (NYSDEC 2014). On December 29, 2008, NYSDEC approved removal of vapor phase treatment (NYSDEC 2008).

- To collect and transfer condensate to the Nassau County Department of Public Works (NCDPW) sanitary sewer, in accordance with the requirements set forth by the NCDPW (NCDPW 2007, 2008) or dispose off-site at a NYSDEC-permitted

disposal facility. The sanitary sewer ultimately discharges to the Town of Oyster Bay's Cedar Creek treatment facility.

2.4 Main Features/Components of the BPSGCS

Following review and approval of the Soil Gas IRM 95% Design Report and Design Drawings by the NYSDEC (ARCADIS 2007b), the design package was finalized and the BPSGCS constructed. A general site plan (Figure 2) shows the treatment building, which houses the major process equipment, including two 20-horsepower [hp] and one 30 hp regenerative-type depressurization blowers, three 52-gallon moisture separators and associated transfer pumps, and one heat exchanger. Remaining system components are located outside the treatment building and include one 33-foot tall by 16-inch diameter stack, the 18 depressurization wells, and the 47 induced vacuum monitoring wells, also shown on Figure 2. Monitoring well vacuum measurements collected during 2014 are also provided on Figure 2. A process flow diagram that shows sampling and monitoring locations is provided as Figure 3. A detailed description of the system and a complete set of record drawings are provided in the OM&M Manual (ARCADIS 2009a).

3. Operation and Maintenance Activities

The following subsections provide a summary of the routine and non-routine operation and maintenance (O&M) activities completed during the review period to meet requirements outlined in the OM&M Manual (ARCADIS 2009a), as well as a performance evaluation of the BPSGCS. Finally, overall conclusions and recommendations regarding O&M for the Site are included in this section.

3.1 Summary of O&M Completed During the Review Period

In general, the O&M of the BPSGCS was conducted in accordance with the OM&M Manual (ARCADIS 2009a). This consisted of the following:

- Continuous monitoring by the Supervisory Control and Data Acquisition (SCADA) system.

- Weekly site checks to monitor and record key process parameters to confirm proper system operation, to assess whether a process parameter is changing or is out of range, and to provide information that may be helpful later in case there is an operation problem.

- Quarterly monitoring events to monitor and record key process parameters, including induced vacuums, to confirm proper system operation, make adjustments as needed, and to collect compliance samples. A summary of the quarterly monitoring data collected for the BPSGCS is provided in Tables 1, 2 and 3 and Appendix A.

- Routine maintenance of equipment was generally performed in accordance with the manufacturers' specifications as needed. This included annual alarm testing to confirm proper function of all advisory and system alarms.

- Non-routine maintenance of equipment and system components in response to alarm conditions or system parameters operating outside of their normal operating ranges. The most notable non-routine maintenance activities during the review period were due to system modifications, power anomalies, building high temperature alarms, blower failures, and heat exchanger high exhaust temperature alarms. These conditions did not have a large impact on system performance and have been proactively addressed to minimize system downtime.

3.2 Performance Evaluation

3.2.1 Fourth Quarter Performance Evaluation

The OU3 BPSGCS operated continuously during the fourth quarter reporting period (greater than 99 percent uptime) with the exception of brief shutdown events for routine and non-routine system maintenance. An operational summary of the depressurization wells, monitoring wells, flow rates and vacuums for the fourth quarter is provided in Tables 1 and 2. In summary:

- The time-weighted rolling average of all compliance points for the fourth quarter reporting period were greater than -0.1 iwc (Table 3).

- The BPSGCS effluent air quality complied with applicable AGCs throughout 2014, based on a 12-month rolling average (Table 5 and Appendix B).

3.2.2 Review Period Performance Evaluation

The OU3 BPSGCS operated continuously during the review period with the exception of brief shutdown events for routine and non-routine system maintenance. An

operational summary of the depressurization wells, monitoring wells, flow rates and vacuums for the review period is provided in Tables 1 and 2. In summary:

- The system operated during the review period for approximately 2,456 days out of a total 2,509 days (approximately 98% uptime).

- Over the review period, several wells, notably VMWC-7A, -7B, -14A, -14B, -18A, and -18B, have had issues maintaining the -0.1 iwc at the well heads as shown on Table 3 and described below:

    - VMWC-7A: The 12-month rolling average at VMWC-7A ranged from -0.086 to -0.095 iwc from December 2, 2009 through August 30, 2010. The 12-month rolling averages are lower than the compliance value of -0.1 iwc as a result of an incorrect value recorded on December 2, 2009 (Table 2).

    - VMWC-7A: The 12-month rolling average at VMWC-7A was noted as -0.099 iwc on December 20, 2012. The 12-month rolling average is slightly lower than the compliance value as a result of lower induced vacuum readings on March 9, 2012, September 17, 2012 and December 20, 2012 (Table 2). The lower induced vacuums were caused by condensate accumulation and/or normal seasonal fluctuations. The lower induced vacuums were rectified by performing a condensate removal event.

    - VMWC-14A: The 12-month rolling average at VMWC-14A was noted as -0.096 iwc from March 7, 2011 through March 9. 2012. The 12-month rolling average is slightly lower than the compliance value of -0.1 iwc as a result of lower induced vacuum readings on June 6, 2011 and September 19, 2011 (Table 2). The lower induced vacuums were caused by normal seasonal fluctuations.

    - VMWC-18A: The 12-month rolling average at VMWC-18A ranged from -0.073 to -0.094 iwc from December 3, 2010 through December 5, 2011. The 12-month rolling averages are lower than the compliance value of -0.1 iwc as a result of lower induced vacuum readings on August 30, 2010, December 3, 2010, March 7, 2011 and December 5, 2011 (Table 2). The lower induced vacuums were caused by condensate accumulation. The lower induced vacuums were rectified by performing a condensate removal event.

- VMWC-18A: The 12-month rolling average at VMWC-18A ranged from -0.080 to -0.099 iwc from December 20, 2012 to September 5, 2013. The 12-month rolling averages are lower than the compliance value of -0.1 iwc as a result of lower induced vacuum readings on December 5, 2011, September 17, 2012, December 20, 2012 and March 28, 2013 (Table 2). The lower induced vacuums were caused by condensate accumulation. The lower induced vacuums were rectified by performing a condensate removal event.

- VMWC-18B: The 12-month rolling average at VMWC-18B was noted as -0.097 iwc on March 28, 2013 and June 19, 2013. The 12-month rolling averages are lower than the compliance value of -0.1 iwc as a result of a lower induced vacuum reading on December 20, 2012 (Table 2). The lower induced vacuum was caused by condensate accumulation. The lower induced vacuums were rectified by performing a condensate removal event.

- The BPSGCS effluent air quality complied with applicable AGCs throughout the review period (Table 5 and Appendix B).

- During the review period, condensate disposal was completed as necessary and was typically associated with a below grade line condensate removal event. As of 2014, condensate removal is only conducted periodically by manipulating manifold vacuums and flow rates for brief periods of time. This process does not entirely vacate the below grade lines of condensate, though it enables the system to maintain adequate flow and vacuum at the manifolds without requiring a vacuum truck and a full day shutdown event.

3.3 Conclusions and Recommendations for O&M

Generally, the O&M activities conducted during 2014 and throughout the review period met the overall O&M requirements.

4. Monitoring

The following subsections provide a summary of the monitoring completed during this review period to meet requirements outlined in the OM&M Manual (ARCADIS 2009a). The following subsections also provide summaries of 2014 monitoring data, comparisons of the results with applicable AGCs and SGC's, and additional data

evaluations describing the performance effectiveness of the OU3 BPSGCS. Finally, overall conclusions and recommendations regarding monitoring for the Site are included.

4.1 Summary of Monitoring Completed

In general, the monitoring of the OU3 BPSGCS was completed in accordance with the OU3 BPSGCS OM&M Manual (ARCADIS 2009a). A summary of the monitoring completed during this review period is provided below:

- Quarterly system performance monitoring:
    - Instantaneous vacuum measurements at compliance measurement points and system operating measurements at influent manifolds, blower inlet and outlet, and system effluent were collected to assess the system performance. Summaries of the measurements are provided in Tables 1 and 2.
- Quarterly system compliance monitoring:
    - Containment system air quality monitoring was completed to monitor the performance of the containment system and to compare the levels to applicable AGC's and SGC's. Summaries of the results are provided in Tables 4 and 5 and Appendices A and B.

4.2 Summary of Monitoring Results

4.2.1 Containment System Performance Monitoring

Containment system performance monitoring results are summarized in the following subsections.

4.2.1.1 Fourth Quarter System Operating Parameters

System operating parameters measured during the fourth quarter reporting period are summarized in Tables 1 and 2. Except for the knockout tank influent vacuum, during the fourth quarter system operating parameters were consistent with the recommended values in Table 3 of the OM&M Manual (ARCADIS 2009a). In addition, the heat exchanger influent temperature remained lower than the design influent temperature

(i.e., 150 °F); accordingly, the heat exchanger was not operated during the fourth quarter reporting period.

Although the knockout tank influent vacuum operated outside of the recommended range, the instantaneous induced-vacuum readings at all compliance-related monitoring points during the fourth quarter reporting period was greater than or equal to -0.1 iwc (see Section 3.2 of this report). Therefore, no immediate action is warranted. The system operating parameters described above will continue to be evaluated and addressed, if necessary, during the next reporting period.

4.2.1.2 Review Period System Operating Parameters

System operating parameters measured during the review period are summarized in Tables 1 and 2. Overall throughout the review period, the system components generally operated within their recommended ranges.

4.2.1.3 Vapor Sample

The total effluent screening level vapor samples (i.e., photoionization detector [PID] reading) measured during the fourth quarter reporting period and review period are provided in Table 1. The screening result from the fourth quarter monitoring event was 0.2 parts per million by volume (ppmv), which is consistent with data collected throughout 2014 and the review period.

4.2.2 Containment System Compliance Monitoring

4.2.2.1 System Operating Parameters

Instantaneous vacuum measurements in compliance monitoring wells from the fourth quarter reporting period and annual time-weighted rolling averages are summarized in Tables 2 and 3. Measurements from Year 2014 are also shown (in text box format) on Figure 2.

As shown on Tables 2 and 3, during the fourth quarter reporting period, the instantaneous induced vacuum at all compliance-related monitoring points met or exceeded the minimum performance standard (greater than or equal to -0.1 iwc). The annual time-weighted rolling average of induced vacuum readings at all compliance-related monitoring points were maintained at greater than or equal to -0.1 iwc, demonstrating that the BPSGCS is operating as designed.

During the review period overall, as shown on Table 2 and 3, the instantaneous induced vacuum at all compliance-related monitoring points were generally greater than or equal to -0.1 iwc and maintained a time-weighted rolling average greater than -0.1 iwc, with several exceptions as described in Section 3.2. Several monitoring periods were lower than the EPA's radon guidance value of a negative pressure of 0.035 iwc during the review period, however, the annual time-weighted rolling average of induced vacuum readings at all compliance-related monitoring points was always greater than -0.035 iwc.

4.2.2.2 Vapor Sample

A total effluent vapor sample was collected on December 10, 2014. As shown in the laboratory results in Table 4 and Appendix A-1, the total volatile organic compound (TVOC) concentration of 1,289 micrograms per cubic meter (µg/m^3) was higher than the September 2014 concentration (720 µg/m^3) but consistent with historical data. The Project TVOC concentration of 1,143 µg/m^3 was also higher than the September 2014 concentration (542 µg/m^3), but consistent with historical data. The Non-project TVOC concentration of 146 µg/m^3 was lower than the September 2014 concentration (178 µg/m^3), but consistent with historical data.

Overall, the concentration of TVOCs has declined since system startup. Figure 4 provides an overview of the concentration trend over the review period. The containment system has removed a total of approximately 273.8 pounds of TVOCs, with 216.7 pounds of Project TVOCs (79.1%) and 57.1 pounds of Non-project TVOCs (20.9%) as shown on Figure 5. Figure 6 also provides a mass removal rate, which has also declined since system startup.

Benzene, carbon tetrachloride and vinyl chloride, environmentally "A"-rated compounds (as defined in DAR-1 AGC/SGC tables, revised February 28, 2014), were detected in the effluent vapor sample during the reporting period; the concentrations were consistent with historical data. Historically, these are the only three environmentally "A"-rated compounds detected in the effluent vapor samples.

Seventeen tentatively identified compounds (TICs) were also identified by the laboratory (Appendices A-2 and A-3) during the reporting period. The concentrations of the TICs were consistent with data collected throughout the review period. The three most commonly identified TICs over the review period were acetophenone, alpha-methlystyrene (methyl styrene [alpha]) and alpha-cumyl alcohol (2-phenyl-2-propanol).

4.2.2.3 Condensate Samples

A compliance monitoring condensate sample was not required to be collected for laboratory analysis during the reporting period.

Historic condensate sample results are provided in Table 6 and Appendix C. Condensate historically generated was disposed of in the Nassau County Department of Public Works (NCDPW) sewer system, with NCDPW Approval (NCDPW 2008). TICs have not been detected in any sample collected during the review period.

4.2.3 Air Emissions Model

Effluent vapor laboratory results were compared to the NYSDEC DAR-1 SGCs (Table 4). In addition, effluent vapor laboratory analytical results were compared to a site-specific modeled annual maximum allowable stack concentration (MASC). The annual MASC was calculated during each monitoring event for individual compounds using the output from a U.S. Environmental Protection Agency (USEPA) SCREEN3 model in conjunction with the NYSDEC DAR-1 AGCs. A scaling factor was calculated using the SCREEN3 model with site-specific physical layout (e.g., building dimension, stack height, terrain) and operating data (e.g., discharge flow rate, temperature) inputs for each monitoring event. The scaling factor was then used to adjust (scale) the NYSDEC DAR-1 AGC to a site-specific annual MASC. A summary of the instantaneous percent (i.e., not time-weighted) of the site-specific annual MASC for detected compounds is provided in Table 5. A summary of the cumulative annual percent (i.e., time-weighted) of the site-specific MASC for detected compounds is also provided in Table 5. A summary of the model input, outputs, and backup calculations is provided in Appendix B.

The BPSGCS effluent vapor met applicable air discharge criteria in the fourth quarter reporting period and throughout the review period, based on the following:

- The measured concentrations of individual VOCs in the effluent did not exceed applicable SGCs (Table 4).

- The measured concentrations of individual VOCs in the effluent did not exceed applicable instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model (Table 5). Similarly, the time-weighted rolling average for all detected compounds is well below the MASCs.

- Three environmentally "A"-rated compounds were detected in the effluent vapor during the fourth quarter reporting period. Specifically, benzene, carbon tetrachloride and vinyl chloride were detected at 2.7, 0.69, and 1.3 µg/m^3, respectively. However, the mass emission rates for benzene, carbon tetrachloride and vinyl chloride were 6.6 x 10^{-6}, 1.7 x 10^{-6}, and 3.2 x 10^{-6} pounds per hour (lbs/hr), respectively, which is well below the NYSDEC recommended action level of 0.01 lbs/hr. Over the review period, the maximum concentration of each compound was detected at 140, 920, and 1.1 µg/m^3, respectively. This corresponds with mass emission rates of 3.4 x 10^{-4}, 6.1x 10^{-3}, and 2.2 x 10^{-6} lbs/hr, respectively, which is well below the NYSDEC recommended action level of 0.01 lbs/hr.

4.3 Conclusions and Recommendations for Monitoring

Overall, monitoring activities conducted during 2014 and throughout the review period met the monitoring requirements outlined in the OU3 BPSGCS OM&M Manual (ARCADIS 2009a).

5. Evaluation of Performance, Effectiveness, and Protectiveness

The OU3 BPSGCS was effective at achieving compliance goals during the review period. Table 7 provides of summary of how each goal was achieved through operation of the OU3 BPSGCS. Supporting data in the form of tables and figures are also referenced in the previous sections of this Review.

6. Conclusions and Recommendations

This section provides overall conclusions and recommendations based on the Review.

6.1 Compliance with OM&M Manual

Requirements of the OU3 BPSGCS OM&M Manual were met during the reporting period in terms of operation and maintenance noted in Sections 3 and 4.

6.2 Performance and Effectiveness of the OU3 BPSGCS

The following conclusions are provided about the performance and ability of the OU3 BPSGS to comply with the remedial action and compliance objectives for the Site:

- The BPSGCS generally operated as designed during the review period to mitigate the off-site migration of soil gas.
    - The BPSGCS operated continuously with the exception of brief shutdown periods for routine and non-routine maintenance (approximately 98% uptime).
    - Approximately 274 pounds of VOC-impacted soil gas were removed from the subsurface.
    - A vacuum of -0.1 iwc or greater was maintained at a majority of induced vacuum monitoring points over a 12-month rolling average throughout the reporting period (Table 3). While data recorded at several wells indicated that vacuum induced at the well heads was slightly less than the targeted -0.1 iwc, during several events, the issues causing the reduced vacuums (most notably a build-up of condensation water in the vacuum distribution piping) have been corrected and Northrop Grumman will continue to proactively manage this issue through more frequent condensate removal.
    - The operation of the BPSGCS complied with applicable NYSDEC SCGs during the review period.
    - Effluent vapor emissions met applicable AGC and SGC air discharge criteria.
    - Condensate was disposed in accordance with applicable NCDPW requirements or disposed off-site at a NYSDEC-permitted facility.

6.3 Recommendation

Based on the information provided herein, ARCADIS recommends to continue operation of the BPSGCS. No modifications or upgrades are needed at this time.

6.4 Future Periodic Review Submittals

ARCADIS proposes the following reporting requirements be followed:

- Quarterly reports will no longer be submitted; sample analytical results will be tabulated and submitted to the NYSDEC in a memo with an attached site figure without any evaluation.

- Annual summary reports will be submitted to the NYSDEC.

- Periodic review certifications will be completed on a 5-year cycle.

7. References

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Tables

Table 1. Summary of General System Operating Parameters, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

	Extraction Well DW-7S Parameters					Extraction Well DW-7D Parameters					Extraction Well DW-3S Parameters					Extraction Well DW-3D Parameters					Extraction Well DW-5S Parameters					Extraction Well DW-5D Parameters				
Date	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum
	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)
02/18/08(3)	58	-3.6	56	7.2	-2.0	76	-7.2	56	29.3	-2.5	80	-7.3	56	2.8	-2.5	113	-15	54	13.3	-4.5	100	-4.6	57	0.0	-3.0	52	-16	57	0.0	-14
02/19/08(3)	53	-3.8	NM	9.7	-2.0	78	-7.4	NM	26.7	-2.5	45	-2.5	NM	6.5	-1.8	108	-16	NM	16.4	-3.5	57	-2.5	NM	0.0	-2.0	52	-18	NM	0.0	-14
02/25/08(3)	55	-5.5	NM	4.2	-2.0	74	-13	NM	5.8	-2.7	37	-2.0	NM	2.1	-1.5	71	-26	NM	6.6	-2.7	20	-1.1	NM	0.4	-1.5	56	-24	NM	0.0	-18
03/03/08(3)	53	-6.0	NM	2.8	-2.0	84	-13	NM	0.8	-2.7	45	-2.5	NM	1.2	-1.5	88	-16	NM	1.9	-2.7	20	-1.4	NM	0.8	-1.5	66	-27	NM	0.0	-15
03/17/08(3)	76	-9.0	NM	2.6	-2.5	50	-8.0	NM	0.4	-2.0	45	-2.8	NM	1.1	-2.0	83	-16	NM	0.1	-2.7	20	-1.5	NM	0.0	-2.5	70	-32	NM	0.0	-25
04/16/08	85	-10	50	2.7	NM	41	-2.0	55	2.0	NM	15	-0.41	59	0.6	NM	29	-1.1	57	4.6	NM	34	-0.77	55	0.0	NM	32	-22	58	0.6	NM
05/19/08	72	-5.0	57	5.0	-4.0	20	-0.80	62	2.1	-1.5	15	-0.45	62	0.0	-2.0	23	-2.0	59	3.5	-3.0	78	-2.5	60	2.5	-2.5	20	-14	59	0.0	-11
06/02/08	86	-5.8	66	0.0	-1.8	23	-0.70	73	0.0	-0.90	16	-0.40	71	0.0	-1.1	27	-2.0	72	0.0	-1.3	86	-2.3	65	0.0	-2.8	17	-14	74	0.0	-10
07/07/08	49	-4.4	69	4.7	-2.2	18	-1.2	76	2.6	-1.0	18	-0.40	74	2.3	-1.2	18	-11	78	3.1	-2.2	121	-2.2	71	2.1	-2.7	15	-14	82	2.3	-10
08/06/08(5,8)	79	-4.5	76	NM	-2.5	19	-0.90(9)	81	NM	-1.7	9.8	-2.0(6)	77	NM	-1.0	13	-12	80	NM	-1.1	83	-2.1	75	NM	-2.0	4.6	-15	82	NM	-0.90
09/18/08	95	-4.5	69	NM	-1.5	23	-0.80	69	NM	-0.70	13	-3.0	69	NM	-0.20	24	-2.1	69	NM	-1.0	84	-2.2	70	NM	-0.80	6.9	-15	69	NM	-1.0
10/27/08	85	-5.5	63	NM	-1.5	22	-0.80	63	NM	-0.90	13	-7.0(12)	62	NM	-0.80	23	-0.10	63	NM	-0.90	89	-2.2	63	NM	-1.4	18	-15	63	NM	-1.3
11/25/08	NM	-10	54	NM	-1.4	20	-4.0	54	NM	-0.83	13	-12	58	NM	-0.35	30	-0.80	55	NM	-0.63	117	-3.6	55	NM	-1.4	30	-22	54	NM	-3.1
12/18/08	96	-9.0	51	NM	-1.4	20	-1.0	52	NM	-0.56	13	-13	57	NM	-0.27	26	-1.5	52	NM	-0.56	90	-4.0	53	NM	-1.5	68	-18	52	NM	-11
3/19/09(13,14)	95	-26	47	2.3	-0.85	21	-12	47	0.0	-1.7	13	-10	48	0.3	-0.51	26	-12	47	3.2	-0.78	89	-16	47	0.0	-1.6	30	-20	47	0.0	-6.5
06/26/09	83	-17	65	NM	-1.4	6.0	-7.5	68	NM	-0.46	5.0	-7.7	69	NM	-0.26	10	-6.5	67	NM	-0.38	90	-16	65	NM	-1.5	14	-10	66	NM	-2.3
09/29/09	85	-16	64	NM	-1.6	5.5	-8.0	64	NM	-0.46	6.0	-4.5	64	NM	-0.24	10	-6.5	64	NM	-0.39	90	-16	64	NM	-1.6	14	-9.0	64	NM	-2.0
12/02/09	85	-17	65	NM	-1.5	6.0	-7.7	66	NM	-0.46	6.5	-4.7	65	NM	-0.20	9.5	-6.8	66	NM	-0.34	90	-17	65	NM	-1.5	14	-9.4	66	NM	-2.2
03/12/10(16)	90	-21	44	NM	-1.5	7.0	-22	49	NM	-0.50	6.5	-4.6	49	NM	-0.30	10	-7.0	47	NM	-0.40	65	-24	45	NM	-1.6	14	-11	47	NM	-3.4
06/07/10	100	-19	63	NM	-1.7	9.0	-8.5	65	NM	-0.42	5.0	-7.0	66	NM	-0.24	10	-7.0	64	NM	-0.37	85	-17	62	NM	-1.4	16	-10	64	NM	-2.3
08/30/10	95	-19	69	NM	-1.7	15	-8.5	70	NM	-0.62	6.0	-4.5	72	NM	-0.23	10	-6.0	70	NM	-0.35	85	-16	69	NM	-1.4	14	-9.0	70	NM	-2.1
12/03/10	90	-20	51	NM	-1.6	12	-15	50	NM	-0.52	7.0	-4.8	51	NM	-0.25	10	-6.5	51	NM	-0.37	92	-19	51	NM	-1.5	14	-10	51	NM	-2.3
03/07/11	90	-23	44	NM	-1.6	6.0	-8.0	45	NM	-0.45	5.5	-7.0	49	NM	-0.21(18)	10	-7.0	46	NM	-0.41(18)	80	-21	45	NM	-1.4(18)	15	-11	45	NM	-2.7(18)
06/06/11	71	-16	64	NM	-1.2	7.0	-7.9	66	NM	-0.41	8.0	-8.4	64	NM	-0.30	14	-7.5	66	NM	-0.44	93	-17	64	NM	-1.5	14	-9.5	66	NM	-2.2
09/19/11	72	-16	67	NM	-1.3	7.0	-7.8	66	NM	-0.37	7.0	-8.5	67	NM	-0.29	13	-7.3	66	NM	-0.42	95	-18	67	NM	-1.7	14	-9.5	66	NM	-2.1
12/05/11	105	-21	53	NM	-1.5	8.0	-8.5	53	NM	-0.47	6.0(19)	-5.0(19)	54	NM	-0.29	15	-8.0	54	NM	-0.42	90	-20	54	NM	-1.7	15	-11	(20)	NM	-2.8
03/09/12	115	-18	47	NM	-2.0	5.0	-7.5	47	NM	-0.44	6.0	-5.0	48	NM	-0.23	9.0	-6.0	47	NM	-0.31	85	-17	48	NM	-1.5	14	-10	47	NM	-2.4
06/04/12	110	-18	62	NM	-1.9	4.0	-6.0(21)	61	NM	-0.53	6.0	-5.0	62	NM	-0.27	9.0	-7.0	61	NM	-0.38	80	-15	61	NM	-1.4	14	-10	61	NM	-2.2
09/17/12	100	-23	68	NM	-1.9	2.0	-9.0	69	NM	-0.48	5.0	-4.5	69	NM	-0.25	9.0	-6.0	68	NM	-0.34	80	-16	68	NM	-1.3	9.0	-14	68	NM	-1.8
12/20/12	110	-28	51	NM	-2.1	2.8	-11	52	NM	-0.42	5.2	-5.7	53	NM	-0.27	10	-6.5	51	NM	-0.33	93	-19	51	NM	-1.5	12	-12	51	NM	-2.6
03/28/13	87	-20	47	NM	-1.5	3.0	-8.5	49	NM	-0.34	5.0	-6.8	55	NM	-0.21	15	-7.0	48	NM	-0.42	70	-16	50	NM	-1.2	5.0	-9.0	50	NM	-2.4
06/19/13	85	-20	63	NM	-1.5	4.5	-11	67	NM	-0.41	6.2	-5.0	66	NM	-0.24	11	-6.0	67	NM	-0.36	92	-19	63	NM	-1.5	12	-13	65	NM	-2.4
09/05/13	86	-20	71	NM	-1.5	4.0	-13	71	NM	-0.43	5.0	-8.0	73	NM	-0.24	10	-7.0	70	NM	-0.35	95	-19	69	NM	-1.5	12	-13	71	NM	-2.3
12/04/13	100	-19	52	NM	-1.7	5.0	-11	56	NM	-0.46	5.0	-6.5	62	NM	-0.22	10	-9.0	53	NM	-0.39	85	-19	55	NM	-1.4	12	-13	53	NM	-2.3
03/11/14	93	-15	NM	NM	-1.7	4.0	-20	NM	NM	-0.38	12	-9.1	NM	NM	-0.40	11	-6.4	NM	NM	-0.44	62	-12	NM	NM	-1.1	11	-12	NM	NM	-2.7
06/20/14	110	-18	NM	NM	-1.6	12	-12	NM	NM	-0.52	7.0	-4.8	NM	NM	-0.23	17	-8.2	NM	NM	-0.48	103	-16	NM	NM	-1.5	13	-14	NM	NM	-2.3
09/10/14	97	-20	NM	NM	-1.7	6.8	-8.2	NM	NM	-0.42	7.0	-5.2	NM	NM	-0.20	11	-7.0	NM	NM	-0.30	84	-15	NM	NM	-1.4	15	-8.5	NM	NM	-2.0
12/10/14	94	-21	NM	NM	-1.7	6.0	-8.0	NM	NM	-0.50	7.0	-5.6	NM	NM	-0.26	9.0	-7.0	NM	NM	-0.38	83	-16	NM	NM	-1.4	13	-9.0	NM	NM	-2.1

Notes and abbreviations on last page.

Table 1. Summary of General System Operating Parameters, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

	Extraction Well DW-6S Parameters					Extraction Well DW-6D Parameters					Extraction Well DW-1S Parameters					Extraction Well DW-1D Parameters					Extraction Well DW-4S Parameters					Extraction Well DW-4D Parameters					
Date	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum	Flow Rate at Manifold	Flow Rate at Manifold	Vacuum at Manifold	Temperature at Manifold	PID Measured Concentration	Wellhead Vacuum
	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(iwc)	(°F)	(ppmv)	(iwc)	(scfm)	(fpm)	(iwc)	(°F)	(ppmv)	(iwc)
02/18/08[3]	170	-13	55	0.0	-6.0	44	-16	60	0.0	-14	160	-12	54	0.0	-5.0	20	-17	62	0.0	-15	170	-12	55	0.0	-2.0	8.0	268	-2.0	60.8	0.0	-3
02/19/08[3]	167	-14	NM	0.0	-6.0	48	-18	NM	0.0	-14	235	-20	NM	0.0	-8.0	20	-18	NM	0.0	-16	155	-14	NM	0.0	-5.5	8.0	253	-2.0	NM	0.0	-1.5
02/25/08[3]	167	-16	NM	0.0	-6.0	94	-24	NM	0.0	-21	228	-25	NM	NM	-7.2	28	-24	NM	0.0	-25	160	-16	NM	0.0	-5.5	8.0	160	-1.1	NM	0.0	-2.0
03/03/08[3]	170	-16	NM	0.5	-5.5	55	-25	NM	0.0	-20	208	-27	NM	0.1	-7.0	32	-27	NM	0.0	-25	160	-16	NM	1.1	-5.7	8.0	110	-1.0	NM	0.0	-2.0
03/17/08[3]	185	-22	NM	0.0	-6.0	65	-31	NM	1.2	-22	208	-29	NM	0.0	-7.5	32	-33	NM	0.0	-30	176	-26	NM	0.0	-6.0	8.0	124	-1.3	NM	0.0	-1.75
04/16/08	50	-1.4	54	0.2	NM	11	-1.9	58	1.9	NM	89	-3.3	52	0.0	NM	4.0	-0.79	61	0.0	NM	48	-1.4	56	0.0	NM	9.3	214	-0.48	60.6	0.0	NM
05/19/08	43	-1.2	62	2.5	-1.3	11	-2.6	60	0.0	-2.0	148	-11	56	0.0	-4.5	6.6	-1.8	64	0.3	-2.5	32	-1.0	62	1.7	-2.7	15	349	-1.1	63.3	0.6	-2.2
06/02/08	48	-1.2	68	0.0	-1.2	15	-2.2	73	0.0	-2.5	180	-10	61	0.0	-4.2	8.5	-1.8	74	0.0	-5.1	31	-0.70	66	0.0	-2.1	17	412	-1.2	71.6	0.0	-2.7
07/07/08	53	-1.5	72	1.2	-2.0	15	-2.1	75	3.3	-2.2	153	-6.0	69	2.3	-3.8	8.7	-1.3	77	2.2	-4.7	38	-0.20	73	1.2	-2.1	18	436	-1.1	73.0	2.5	-1.8
08/06/08[5,8]	41	-1.2	75	NM	-1.0	12	-2.1	80	NM	-0.90[6]	138	-6.2	75	NM	-3.0	13	-1.2	81	NM	-1.1	13	-0.80	87	NM	-0.60	13	307	-1.0	80.7	NM	0.0[10]
09/18/08	42	-1.1	70	NM	-0.90	13	-2.1	70	NM	-1.5	152	-6.2	71	NM	-3.0	6.3	-1.5	70	NM	-1.5	9.3	-12	70	NM	-0.50	14	340	-0.50	69.6	NM	-0.38 [11]
10/27/08	42	-1.2	63	NM	-0.90	11	-2.0	62	NM	-0.20	155	-6.7	63	NM	-2.8	6.3	-1.5	63	NM	-1.8	31	-13	62	NM	-0.50	14	326	-0.60	62.6	NM	-0.40
11/25/07	53	-1.6	55	NM	-0.88	6.1	-1.0	56	NM	-0.79	63	-3.0	56	NM	-1.2	1.5	-0.10	62	NM	-0.26	55	-19	62	NM	-0.15	18	420	-0.70	54.6	NM	-0.51
12/18/08	48	-1.5	53	NM	-0.80	5.2	-1.0	54	NM	-0.70	54	-2.5	53	NM	-1.0	8.2	-1.5	53	NM	-1.4	18	-17	58	NM	-0.23	17	388	-0.75	51.8	NM	-0.40
3/19/09[13,14]	47	-12	47	0.0	-0.95	5.1	-4.6	48	0.0	-1.1	59	-16	47	0.0	-1.2	8.0	-4.2	47	0.0	-2.4	18	-18	47	0.0	-0.43	19	NA	-11	47	0.0	-0.96
06/26/09	36	-11	66	NM	-0.74	10	-6.0	67	NM	-1.9	65	-21	65	NM	-1.7	6.1	-3.00	69	NM	-1.6	82	-16	65	NM	-1.6	7.0	NA	-7.0	67.6	NM	-0.78
09/29/09	34	-11	64	NM	-0.80	10	-6.4	64	NM	-1.9	85	-21	64	NM	-1.6	6.1	-3.40	64	NM	-1.8	85	-16	64	NM	-1.7	6.5	NA	-9.5	64.0	NM	-0.80
12/02/09	89	-16	65	NM	-1.6	6.2	-4.9	66	NM	-1.1	90	-21	65	NM	-2.2	6.1	-4.30	66	NM	-1.6	78	-16	65	NM	-1.4	6.5	NA	-5.4	65.6	NM	-0.30
03/12/10[16]	90	-16	46	NM	-1.9	6.4	-5.0	48	NM	-1.7	87	-22	46	NM	-2.4	6.1	-3.4	50	NM	-1.5	85	-16	47	NM	-1.6	8.0	NA	-6.0	49	NM	-0.86
06/07/10	75	-17	63	NM	-1.5	5.8	-5.4	65	NM	-1.4	73	-21	63	NM	-1.8	5.7	-3.6	65	NM	-2.1	71	-16	63	NM	-1.5	6.0	NA	-8.2	64	NM	-0.71
08/30/10	75	-16	69	NM	-1.8	5.8	-5.0	72	NM	-1.2	75	-21	68	NM	-1.5	5.6	-3.2	72	NM	-1.6	70	-15	68	NM	-1.4	8.0	NA	-5.5	71	NM	-0.61
12/03/10	90	-19	51	NM	-1.7	6.3	-5.1	51	NM	-1.3	95	-24	53	NM	-2.0	6.3	-3.3	51	NM	-1.8	81	-16	52	NM	-1.6	6.8	NA	-7.8	51	NM	-0.72
03/07/11	90	-19	46	NM	-1.8	6.3	-5.5	47	NM	-1.5[19]	93	-24	46	NM	-2.3	6.2	-3.4	NM	NM	-1.8	82	-16	47	NM	-1.7	8.0	NA	-6.3	47	NM	-0.87[18]
06/06/11	95	-17	64	NM	-1.8	7.8	-5.5	66	NM	-1.6	81	-23	64	NM	-2.0	6.1	-4.0	66	NM	-1.7	67	-15	64	NM	-1.6	5.0	NA	-12	66	NM	-0.62
09/19/11	100	-17	67	NM	-2.1	7.5	-5.5	66	NM	-1.7	95	-27	67	NM	-2.2	6.0	-3.5	66	NM	-1.8	68	-15	66	NM	-1.4	8.0	NA	-6.0	66	NM	-0.76
12/05/11	93	-19	[20]	NM	-2.0	8.2	-6.0	[20]	NM	-1.8	95	-22	[20]	NM	-2.3	6.7	-4.0	[20]	NM	-2.0	83	-16	[20]	NM	-1.7	9.0	NA	-6.0	[20]	NM	-0.84
03/09/12	72	-14	48	NM	-1.3	6.0	-5.0	47	NM	-1.5	90	-20	48	NM	-2.0	4.5	-3.0	48	NM	-1.8	85	-16	48	NM	-1.7	7.2	NA	-6.0	48	NM	-0.79
06/04/12	65	-15	61	NM	-1.3	5.6	-5.0	62	NM	-1.8	85	-22	62	NM	-1.3	4.3	-2.8	62	NM	-1.9	80	-16	61	NM	-1.6	7.0	NA	-6.0	62	NM	-0.74
09/17/12	70	-15	[23]	NM	-1.4	4.8	-5.0	68	NM	-1.0	80	-22	67	NM	-1.7	3.7	-2.2	69	NM	-1.1	65	-15	67	NM	-2.0	6.0	NA	-7.5	68	NM	-0.57
12/20/12	76	-17	52	NM	-1.6	5.4	-5.0	51	NM	-1.1	103	-23	52	NM	-2.6	4.2	-2.6	52	NM	-1.1	77	-16	52	NM	-1.4	5.5	NA	-8.8	51	NM	-0.64
03/28/13	63	-14	50	NM	-1.2	6.6	-5.4	50	NM	-1.4	55	-18	51	NM	-1.3	6.0	-3.3	50	NM	-1.8	60	-14	52	NM	-1.3	8.5	NA	-7.1	50	NM	-0.66
06/19/13	83	-17	63	NM	-1.7	6.2	-5.0	67	NM	-1.4	92	-24	63	NM	-2.1	3.9	-2.6	67	NM	-1.2	78	-16	63	NM	-1.6	6.0	NA	-8.5	66	NM	-0.72
09/05/13	85	-17	70	NM	-1.7	6.2	-5.2	72	NM	-1.3	93	-24	70	NM	-1.8	1.0	-1.6	72	NM	-1.2	82	-16	71	NM	-1.5	4.0	NA	-5.4	73	NM	-0.59
12/04/13	75	-18	54	NM	-1.8	7.2	-5.5	55	NM	-1.5	80	-23	54	NM	-2.0	3.2	-2.2	57	NM	-1.0	70	-16	54	NM	-1.5	4.0	NA	-5.8	56	NM	-0.63
03/11/14	84	-16	NM	NM	-1.8	6.9	-5.4	NM	NM	-1.6	66	-17	NM	NM	-1.6	3.1	-2.0	NM	NM	-0.91	63	-13	NM	NM	-1.3	8.5	NA	-9.1	NM	NM	-0.78
06/20/14	85	-15	NM	NM	-1.4	8.3	-6.2	NM	NM	-1.5	75	-18	NM	NM	-1.4	8.3	-4.7	NM	NM	-2.0	85	-14	NM	NM	-1.6	5.5	NA	-11	NM	NM	-0.73
09/10/14	82	-17	NM	NM	-1.6	5.9	-5.4	NM	NM	-1.1	72	-19	NM	NM	-1.5	4.7	-2.8	NM	NM	-1.2	62	-14	NM	NM	-1.2	5.5	NA	-5.6	NM	NM	-0.51
12/10/14	79	-18	NM	NM	-1.6	6.4	-5.4	NM	NM	-1.2	75	-20	NM	NM	-2.4	4.7	-3.0	NM	NM	-1.3	75	-16	NM	NM	-1.6	7.0	NA	-5.9	NM	NM	-0.60

Notes and abbreviations on last page.

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Table 1. Summary of General System Operating Parameters, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

	Extraction Well DW-8S Parameters					Extraction Well DW-9S Parameters					Extraction Well DW-2S Parameters					Extraction Well DW-2D Parameters					Extraction Well DW-10S Parameters					Extraction Well DW-11S Parameters				
Date	Flow Rate at Manifold (scfm)	Vacuum at Manifold (iwc)	Temperature at Manifold (°F)	PID Measured Concentration (ppmv)	Wellhead Vacuum (iwc)	Flow Rate at Manifold (scfm)	Vacuum at Manifold (iwc)	Temperature at Manifold (°F)	PID Measured Concentration (ppmv)	Wellhead Vacuum (iwc)	Flow Rate at Manifold (scfm)	Vacuum at Manifold (iwc)	Temperature at Manifold (°F)	PID Measured Concentration (ppmv)	Wellhead Vacuum (iwc)	Flow Rate at Manifold (scfm)	Vacuum at Manifold (iwc)	Temperature at Manifold (°F)	PID Measured Concentration (ppmv)	Wellhead Vacuum (iwc)	Flow Rate at Manifold (scfm)	Vacuum at Manifold (iwc)	Temperature at Manifold (°F)	PID Measured Concentration (ppmv)	Wellhead Vacuum (iwc)	Flow Rate at Manifold (scfm)	Vacuum at Manifold (iwc)	Temperature at Manifold (°F)	PID Measured Concentration (ppmv)	Wellhead Vacuum (iwc)
02/18/08(3)	135	-9.1	55	0.0	-3.0	72	-10	57	0.0	-4.5	45	-5.1	61	0.0	-2.5	80	-12	55.2	0.0	-7.0	75	-14	58	0.0	-5.0	80	-1.5	55	0.0	-13
02/19/08(3)	140	-12	NM	0.0	-3.5	72	-10	NM	0.0	-4.5	65	-10	NM	0.0	-3.6	82	-13	NM	0.0	-8.0	75	-14	NM	0.0	-5.2	70	-16	NM	0.0	-10
02/25/08(3)	138	-15	NM	0.3	-3.5	72	-12	NM	0.4	-4.7	67	-12	NM	0.4	-4.0	40	-6.2	NM	0.0	-5.7	75	-16	NM	0.4	-5.5	77	-20	NM	0.3	-9.0
03/03/08(3)	140	-18	NM	0.9	-3.7	76	-13	NM	0.1	-5.0	67	-14	NM	0.0	-4.5	40	-5.1	NM	0.0	-4.9	78	-17	NM	0.2	-5.5	72	-21	NM	0.0	-9.8
03/17/08(3)	140	-18	NM	0.2	-4.0	76	-12	NM	0.1	-5.5	65	-15	NM	0.0	-4.5	50	-6.0	NM	0.0	-5.0	77	-18	NM	0.1	-5.5	77	-20	NM	0.0	-9.0
04/16/08	35	-2.1	55	0.2	NM	29	-1.5	56	0.2	NM	34	-2.2	57	0.1	NM	19	-0.80	58.6	0.0	NM	24	-1.6	57	0.0	NM	32	-3.1	55	0.4	NM
05/19/08	66	-9.0	59	2.2	-3.5	65	-6.8	59	0.8	-4.2	34	-3.5	62	0.8	-1.7	47	-4.3	59.3	1.2	-4.0	48	-7.2	59	0.7	-3.5	43	-6.0	60	1.1	-3.7
06/02/08	73	-9.2	62	0.0	-3.9	68	-6.8	62	0.0	-4.5	34	-4.1	68	0.0	-1.8	51	-4.4	66.3	0.0	-4.1	53	-9.0	66	0.0	-3.8	46	-6.0	66	0.0	-3.7
07/07/08	102	-9.0	71	2.5	-4.1	87	-7.0	70	0.7	-4.5	41	-3.7	72	2.0	-1.8	56	-4.4	71.0	2.1	-4.0	69	-7.9	71	2.1	-2.5	56	-6.2	71	1.9	-3.8
08/06/08(5,8)	94	-9.0	80	NM	-2.7	68	-7.1	81	NM	-2.5	30	-3.1	82	NM	-1.9	50	-4.5	83.9	NM	-3.0	62	-7.8	81	NM	-3.5	48	-6.4	82	NM	-3.5
09/18/08	100	-9.0	71	NM	-2.3	75	-7.0	71	NM	-2.5	35	-3.5	71	NM	-1.5	50	-4.5	70.1	NM	-3.0	57	-7.5	70	NM	-3.5	50	-6.5	70	NM	-3.5
10/27/08	92	-11	63	NM	-0.10	80	-8.0	63	NM	-2.5	33	-4.1	62	NM	-2.4	52	-4.5	62.4	NM	-2.9	54	-10	62	NM	-3.5	43	-8.1	62	NM	-2.5
11/25/08	81	-16	55	NM	-2.8	86	-12	56	NM	-3.2	42	-7.0	55	NM	-2.1	8.7	-0.50	55.5	NM	-0.49	56	-14	55	NM	-4.1	46	-11	54	NM	-3.5
3/19/09(13,14)	71	-15	52	NM	-2.1	71	-11	53	NM	-2.9	28	-10	53	NM	-1.3	60	-5.3	51.6	NM	-2.9	43	-14	52	NM	-2.4	36	NM	51	NM	-2.4
3/19/09(13,14)	73	-23	47	0.0	-2.1	73	-25	46	0.0	-3.1	29	-17	46	8.6	-1.4	55	-38	NA	0.0	-3.8	40	-22	46	0.4	-2.6	39	-23	46	0.0	-3.2
06/26/09	85	-23	65	NM	-2.8	45	-26.5	66	NM	-2.0	0(4)	-27	NA	NM	-0.06	40	-24	NA	NM	-2.6	52	-22	65	NM	-3.4	30	-22	66	NM	-2.3
09/29/09	78	-21	64	NM	-2.4	45	-16.0	64	NM	-1.9	31	-19	64	NM	-1.8	37	-24	64.0	NM	-2.4	55	-12	64	NM	-3.4	31	-22	64	NM	-2.4
12/02/09	72	-24	65	NM	-1.9	30	-13.3	65	NM	-1.2	31	-23	65	NM	-1.2	37	-25	65.6	NM	-1.6	30	-14	65	NM	-2.3	32	-25	65	NM	-2.3
03/12/10(16)	80	-25	47	NM	-2.4	33	-14	49	NM	-1.4	31	-23	49	NM	-1.9	38	-24	47	NM	-2.5	40	-18	47	NM	-1.8	36	-27	47	NM	-2.8
06/07/10	85	-23	63	NM	-2.4	28	-14	64	NM	-1.2	34	-18	63	NM	-1.5	35	-24	63	NM	-2.5	32	-15	64	NM	-1.9	33	-24	64	NM	-2.4
08/30/10	82	-22	68	NM	-2.4	27	-13	68	NM	-1.1	32	-20	68	NM	-1.6	35	-21	68	NM	-2.2	35	-14	68	NM	-1.9	32	-23	68	NM	-2.5
12/03/10	70	-24	52	NM	-2.2	34	-14	53	NM	-1.3	30	-21	53	NM	-1.8	35	-24	52	NM	-2.3	35	-18	52	NM	-0.69	15	-27	52	NM	-0.68
03/07/11	80	-26	47	NM	-2.4	32	-14	48	NM	-1.4	34	-25	48	NM	-2.0	36	-24	47	NM	-2.6	33	-11	49	NM	-2.1	15	-29	49	NM	-1.2(18)
06/06/11	84	-23	64	NM	-2.3	31	-14	64	NM	-1.2	37	-21	64	NM	-1.6	41	-26	66	NM	-2.7	31	-14	64	NM	-1.7	31	-26	64	NM	-2.4
09/19/11	83	-22	65	NM	-2.4	31	-14	65	NM	-1.3	32	-22	65	NM	-1.7	42	-26	65	NM	-2.9	30	-15	64	NM	-1.8	29	-26	65	NM	-2.3
12/05/11	70	-25	(20)	NM	-2.1	35	-15(19)	(20)	NM	-1.6	33(19)	-22(19)	(20)	NM	-1.8	44	-29	(20)	NM	-3.0	25	-10(19)	(20)	NM	-0.9	35(19)	-22(19)	(20)	NM	-1.3
03/09/12	65	-17	48	NM	-2.1	30	-13	48	NM	-1.3	30	-16	48	NM	-1.4	36	-22	48	NM	-2.4	30	-13	48	NM	-1.6	44	-20	48	NM	-2.8
06/04/12	60	-18	62	NM	-1.9	25	-14	62	NM	-1.2	28	-16	62	NM	-1.4	34	-21	61	NM	-2.2	30	-13	62	NM	-1.6	40	-19	62	NM	-2.7
09/17/12	63	-18	67	NM	-1.8	48	-16	67	NM	-1.9	28	-16	66	NM	-1.3	34	-19	66	NM	-2.1	38	-17	66	NM	-2.0	31	-19	66	NM	-2.5
12/20/12	65	-24	53	NM	-2.1	36	-14	53	NM	-1.6	45	-31	52	NM	-2.1	49	-33	52	NM	-3.0	20	-32	53	NM	-0.5	20	-25	52	NM	-0.70
03/28/13	62	-18	52	NM	-2.0	30	-13	56	NM	-1.4	28	-18	56	NM	-1.4	32	-20	50	NM	-2.3	35	-14	54	NM	-1.9	26	-12	51	NM	-1.9
06/19/13	46	-15	62	NM	-1.4	34	-14	63	NM	-1.5	33	-22	64	NM	-1.6	38	-24	63	NM	-2.5	36	-17	64	NM	-1.9	32	-17	64	NM	-2.5
09/05/13	48	-15	70	NM	-1.3	34	-14	70	NM	-1.4	34	-21	69	NM	-1.6	19	-13	71	NM	-1.6	38	-14	71	NM	-1.8	34	-21	68	NM	-2.2
12/04/13	47	-17	55	NM	-1.4	33	-14	57	NM	-1.3	29	-24	57	NM	-1.4	21	-14	53	NM	-1.3	30	-14	56	NM	-1.6	29	-22	54	NM	-2.6
03/11/14	65	-17	NM	NM	-1.9	38	-14	NM	NM	-1.7	27	-23	NM	NM	-1.4	18	-12	NM	NM	-1.4	40	-13	NM	NM	-2.2	39	-22	NM	NM	-3.0
06/20/14	68	-17	NM	NM	-1.7	37	-14	NM	NM	-1.2	27	-18	NM	NM	-1.3	32	-21	NM	NM	-2.0	35	-13	NM	NM	-2.0	29	-18	NM	NM	-2.1
09/10/14	60	-18	NM	NM	-1.8	28	-13	NM	NM	-1.1	28	-22	NM	NM	-1.5	29	-19	NM	NM	-2.0	27	-13	NM	NM	-1.5	31	-22	NM	NM	-2.2
12/10/14	65	-23	NM	NM	-2.3	32	-14	NM	NM	-1.5	30	-28	NM	NM	-1.8	34	-22	NM	NM	-2.1	25	-13	NM	NM	-1.6	27	-25	NM	NM	-2.2

Notes and abbreviations on last page.

Table 1. Summary of General System Operating Parameters, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

	Knock Out Tank Parameters			Condensate Water Collected [1]	Blower Parameters BL-200					Blower Parameters BL-300					Blower Parameters BL-400					Combined Blower Parameters VSP-601					Stack Parameters VSP-602		Water Levels in Wells				
	Vacuum																													
Date	Influent KO-200	Influent KO-300	Influent KO-400	Influent ST-510	Influent Vacuum	Effluent Pressure	Effluent Flow Rate	Effluent PID	Blower Speed	Influent Vacuum	Effluent Pressure	Effluent Flow Rate	Effluent PID	Blower Speed	Influent Vacuum	Effluent Pressure	Effluent Flow Rate	Effluent PID	Blower Speed	Total Effluent Flow Rate [2]	Total Effluent PID	Heat Exchanger Influent Temp.	Total Effluent Pressure	Heat Exchanger Effluent Temp.	Effluent PID	Discharge Temperature	Effluent Relative Humidity	VMWC-1D	VMWC-5D	B24MW-3	VMWC-1C	VMWC-5B
	(iwc)	(iwc)	(iwc)	(gal)	(iwc)	(iwc)	(scfm)	(ppmv)	(Hz)	(iwc)	(iwc)	(scfm)	(ppmv)	(Hz)	(iwc)	(iwc)	(scfm)	(ppmv)	(Hz)	(scfm)	(ppmv)	(°F)	(iwc)	(°F)	(ppmv)	(°F)	(%)	(ft bmp)	(ft bmp)	(ft bmp)	(ft bmp)	(ft bmp)
02/18/08[3]	-18	-38	-35	0	-20	6.2	500	6.4	NM	-40	12	595	0.0	NM	-38	12	643	0.0	NM	1964	0.9	100	9.6	93	0.0	NM	NM	52.13	Dry	53.75	Dry	Dry
02/19/08[3]	-20	-40	-36	0	-21	9.0	432	2.7	NM	-41	12	842	1.6	NM	-39	10	605	1.3	NM	1674	NM	95	9.8	84	NM	NM	NM	52.17	Dry	53.77	Dry	Dry
02/25/08[3]	-27	-42	-40	24	-28	8.2	434	NM	NM	-43	10	822	NM	NM	-42	10	653	NM	NM	1679	2.4	94	9.0	94	0.0	NM	NM	52.19	49.12	53.89	38.20	Dry
03/03/08[3]	-27	-44	-42	71	-29	7.6	392	NM	NM	-45	10	752	NM	NM	-44	10	685	NM	NM	1793	0.5	104	8.6	94	0.0	NM	NM	Dry	Dry	53.90	Dry	Dry
03/17/08[3]	-33	-43	-41	NM	-34	7.6	412	NM	NM	-45	10	718	NM	NM	-44	10	805	NM	NM	1774	0.0	103	8.0	96	0.0	NM	NM	Dry	Dry	53.62	Dry	Dry
04/16/08	0	-32	0	83	0	0	0	NM	NM	-35	1.0	641	1.0	NM	0	0	0	NM	NM	NM	1.0	90	0.9	82	0.7	NM	NM	51.55	48.47	53.25	Dry	Dry
05/19/08	0	-18	0	0	0	0	NM	NM	NM	-20	1.5	666	3.1	NM	0	0	NM	NM	NM	NM[4]	4.6	85	1.4	74	1.7	NM	NM	51.53	48.50	53.20	Dry	Dry
06/02/08	0	-16	0	0	0	0	NM	NM	NM	-20	1.2	746	0.0	NM	0	0	NM	NM	NM	NM[4]	0.0	85	1.6	85	0.0	NM	NM	51.71	50.55	53.33	Dry	Dry
07/07/08	0	-17	0	0	0.0	0	NM	NM	NM	-20	1.5	829	0.9	NM	0	0	NM	NM	NM	NM[4]	0.70	85	1.5	90	0.0	NM	NM	52.25	Dry	53.90	Dry	Dry
08/06/08[5,8]	0	-18	0	0	NM	NM	NM	NM	NM	-20	1.5	640	NM	NM	NM	NM	NM	NM	NM	NM[4]	0.0	98	1.6	95	0.0	NM	NM	52.62[7]	Dry[7]	54.20	Dry	Dry
09/18/08	0	-18	0	0	0.0	0	NM	NM	NM	-20	1.5	633	NM	NM	0	0	NM	NM	NM	583	0.40	95	1.6	91	0.1	NM	NM	52.78	Dry	54.36	Dry	Dry
10/27/08	0	-18	0	0	0.0	0	NM	NM	NM	-20	1.5	552	NM	NM	0	0	NM	NM	NM	523	0.20	85	1.6	85	0.1	NM	NM	52.95	Dry	54.54	Dry	Dry
11/25/08	0	-23	0	0	NM	NM	NM	NM	NM	-24	1.0	NM	NM	NM	NM	NM	NM	NM	NM	487	1.4	95	1.3	70	NM	NM	NM	53.03	Dry	54.70	Dry	Dry
12/18/08	0	-20	0	0	NM	NM	NM	NM	NM	-24	1.2	NM	NM	NM	NM	NM	NM	NM	NM	540	0.0	80	1.4	74	0.0	NM	NM	NM	NM	NM	NM	NM
3/19/09[13,14]	-41	0	0	100	-44	3	828 [15]	1.1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	534	0.4	100	2.7	90	NM	NM	NM	Dry	Dry	55.60	Dry	Dry
06/26/09	0	-31	0	0	NM	NM	NM	NM	NM	-35	2.4	NM	NM	NM	NM	NM	NM	NM	NM	573	0.60	105	2.4	90	NM	NM	NM	Dry	Dry	54.00	Dry	Dry
09/29/09	0	-23	0	0	NM	NM	NM	NM	NM	-23	2.0	NM	NM	NM	NM	NM	NM	NM	NM	595	0.00	100	2.7	90	NM	NM	NM	Dry	Dry	55.30	Dry	Dry
12/02/09	0	-25	0	0	NM	NM	NM	NM	NM	-32	2.0	NM	NM	NM	NM	NM	NM	NM	NM	615	0.00	100	2.6	91	NM	NM	NM	Wet	Dry	55.44	Dry	Dry
03/12/10[16]	0	-30	0	0	NM	NM	NM	NM	NM	-33	2.0	NM	NM	NM	NM	NM	NM	NM	NM	606	0.00	85	2.2	76	NM	NM	NM	53.24	NM	49.20	38.12	18.50
06/07/10	0	-27	0	0	NM	NM	NM	NM	NM	-31	2.0	NM	NM	NM	NM	NM	NM	NM	NM	666[17]	0.0	105	2.0	95	NM	NM	NM	51.20	46.72	51.31	38.14	18.43
08/30/10	0	-26	0	39	NM	NM	NM	NM	NM	-31	2.0	NM	NM	NM	NM	NM	NM	NM	NM	587	0.0	110	2.1	102	NM	NM	NM	52.20	49.00	53.31	38.10	18.40
12/03/10	0	-29	0	0	NM	NM	NM	NM	NM	-34	2.0	NM	NM	NM	NM	NM	NM	NM	NM	604	0.0	80	2.5	72	NM	NM	NM	53.50	49.30	52.30	38.12	18.32
03/07/11	0	-25	0	31	NM	NM	NM	NM	NM	-35	2.0	NM	NM	NM	NM	NM	NM	NM	NM	761	0.0	90	2.5	72	NM	NM	NM	53.50	49.32	54.52	38.13	18.43
06/06/11	0	-27	0	0	NM	NM	NM	NM	NM	-34	2.0	NM	NM	NM	NM	NM	NM	NM	NM	583	0.0	105	2.5	96	NM	NM	NM	52.20	48.98	53.38	38.10	NM
09/19/11	0	-28	0	0	NM	NM	NM	NM	NM	-32	2.0	NM	NM	NM	NM	NM	NM	NM	NM	572	0.0	110	2.5	92	NM	NM	NM	51.62	49.32	52.65	38.18	18.44
12/05/11	0	-32	0	3892	NM	NM	NM	NM	NM	-38	3.0	NM	NM	NM	NM	NM	NM	NM	NM	590[19]	0.0	100[19]	2.5	80	NM	NM	NM	51.34	48.23	52.41	38.19	18.19
03/09/12	0	-26	0	250	NM	NM	NM	NM	NM	-38	2.0	NM	NM	NM	NM	NM	NM	NM	NM	627	0.2	94	2.5	90	NM	NM	NM	51.75	48.55	52.38	38.12	18.48
06/04/12	0	0	-25[21]	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	-32	2.0	NM	NM	NM	523	0.3	100	3.0	76	NM	NM	NM	NM[22]	NM[22]	NM[22]	NM[22]	NM[22]
09/17/12	0	0	-30	210	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	-34	1.0	NM	NM	NM	480	0.0	120	2.0	94	NM	NM	NM	53.14	49.15	54.24	38.23	18.48
12/20/12	0	0	-28	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	-40	1.0	NM	NM	NM	647	0.5	101	2.0	80	NM	NM	NM	53.30	48.90	55.05	37.86	18.23
03/28/13	-20	0	0	185	-22	2.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	519	0.0	85	2.0	72	NM	NM	NM	Dry	Dry	64.59	Dry	Dry
06/19/13	-32	0	0	10	-34	3.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	515	0.1	104	2.0	96	NM	NM	NM	52.69	Dry	53.48	Dry	Dry
09/05/13	-32	0	0	10	-35	2.5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	683[24]	0.0	110[24]	2.3[24]	115	NM	NM	NM	53.44	Dry	54.48	Dry	Dry
12/04/13	-40	0	0	0	-45	2.2[25]	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	720[26]	0.0	100[26]	2.0	100	NM	NM	NM	53.65	Dry	56.45	Dry	Dry
03/11/14	-39	0	0	90	-42	2.6[27]	NM	NM	55.53	NM	NM	NM	NM	NA	NM	NM	NM	NM	NA	665	0.0	105	3.0	94	NM	NM	NM	NM	NM	NM	NM	NM
06/20/14	-27	0	0	0	-31	2.6[28]	NM	NM	59.48	NM	NM	NM	NM	NA	NM	NM	NM	NM	NA	734	0.0	110	2.5	104	NM	NM	NM	NM	NM	NM	NM	NM
09/10/14	0	-26	0	0	NM	NM	NM	NM	NA	-29	3.8	NM	NM	60.00	NM	NM	NM	NM	NA	683	0.0	110	3.0	96	NM	NM	NM	NM	NM	NM	NM	NM
12/10/14	0	-36	0	0	NM	NM	NM	NM	NA	-35	2.0	NM	NM	60.00	NM	NM	NM	NM	NA	650	0.2	98	2.0	74	NM	NM	NM	NM	NM	NM	NM	NM

Notes and abbreviations on last page.

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Table 1. Summary of General System Operating Parameters, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Notes and Abbreviations:

°F	Degrees Fahrenheit.
DW	Depressurization well.
ft bmp	Feet below measuring point.
gal	Gallons.
iwc	Inches of water column.
NM	Not measured.
ppmv	Parts per million by volume.
scfm	Standard cubic feet per minute.
VMWC	Vapor monitoring well cluster.

1. Total gallons of water recorded at storage tank ST-510 per quarter.
2. Total effluent air velocity in feet per minute was measured using a hand-held anemometer at the stack effluent location. The total effluent flow rate in scfm was calculated by multiplying the measured air velocity by the pipe area, the ratio of the standard air temperature to the measured air temperature, and the
3. Flow rate at manifold on associated dates quantified using venturi flow meter and associated flow chart. Remaining flow rates measured with a hotwire anemometer and calculated to standard conditions.
4. Access point covered by insulation no measurement taken during this round.
5. Temperature readings are erroneous due to field measurement error. July 7, 2008 temperature readings used for conversion of flow to scfm.
6. Data point is average of readings observed which fluctuated between -0.9 and -3.0 iwc.
7. Original parameter not collected on 8/6/08 or was erroneous, data point reported is second reading taken on 08/07/08.
8. Wellhead vacuum gauges replaced during reporting period with lower range/higher accuracy gauges.
9. Gauge vacuum at 0.0 iwc manometer reading used for table.
10. New gauge range too high to collect measurable reading.
11. Vacuum reading taken using digital manometer during this round of monitoring.
12. Data point is average of readings observed which fluctuated between -4.0 and -10 iwc.
13. First round of monitoring with new variable area float type air flow meters installed.
14. Blower BL-300 taken off line on February 10, 2009 and replaced with Blower BL-200.
15. Field transcription error suspected.
16. Readings shown were collected between March 11, and 12, 2010.
17. For the June 7, 2010 monitoring event, the total effluent flow rate was measured directly in standard cubic feet per minute using a hand-held anemometer.
18. Values were remeasured on March 14, 2011 due to erroneous values recorded on March 7, 2011.
19. Values were remeasured on December 22, 2011 due to erroneous values recorded on December 5, 2011.
20. Temperature reading not recorded.
21. Values were remeasured on June 14, 2012 due to erroneous value recorded on June 4, 2012.
22. Water level measurement not recorded due to operator error.
23. Temperature reading not recurded due to operator error.
24. Value was remeasured on October 2, 2013 due to an erroneous value of the total effluent flow rate recorded on September 5, 2013.
25. Value was measured on January 27, 2014 due to an erroneous value recorded on December 4, 2013 as a result of a faulty pressure gauge.
26. Value was remeasured on December 6, 2013 due to an erroneous value of the total effluent flow rate recorded on December 4, 2013.
27. Value was measured on April 9, 2014 due to an erroneous value recorded on March 11, 2014 as a result of a faulty pressure gauge.
28. Value was measured on June 30, 2014 due to an erroneous value recorded on June 20, 2014 as a result of a faulty pressure gauge.

Table 2. Summary of Induced Vacuum Readings at Compliance Monitoring Points, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2]

Well ID:	DW-7S		DW-7D	DW-3S				DW-3D				DW-5S		DW-5D	DW-1S									
Date	VMWC-14A [3]	VMWC-14B [3]	VMWC-14D [3]	VMWC-9A	VMWC-9B	VMWC-10B	VMWC-11B [3]	VMWC-10D	VMWC-11D	VMWC-12D [3]	VMWC-15A [3]	VMWC-15B [3]	VMWC-15D [3]	VMWC-1A	VMWC-2A	VMWC-4A	VMWC-3A [3]	VMWC-1B	VMWC-4B	VMWC-3B [3]	VMWC-1C	VMWC-2C	VMWC-4C	VMWC-3C [3]
02/18/08	-0.05	-0.26	-0.31	-0.51	-0.67	-0.50	-0.41	-0.57	-0.43	-0.34	-0.52	-0.41	-0.35	-0.12	-0.10	-0.07	-0.07	-0.15	-0.08	-0.08	-0.11	-0.11	-0.09	-0.08
02/19/08	-0.09	-0.27	-0.30	-0.42	-0.53	-0.40	-0.33	-0.48	-0.40	-0.31	-0.30	-0.30	-0.35	-0.74	-0.61	-0.50	-0.42	-0.93	-0.58	-0.42	-0.78	-0.66	-0.61	-0.46
02/25/08	-0.09	-0.26	-0.31	-0.39	-0.49	-0.39	-0.34	-0.44	-0.36	-0.31	-0.23	-0.23	-0.27	-0.70	-0.58	-0.44	-0.40	-0.88	-0.54	-0.42	-0.74	-0.62	-0.55	-0.44
03/03/08	-0.11	-0.28	-0.31	-0.38	-0.44	-0.37	-0.31	-0.41	-0.33	-0.27	-0.19	-0.21	-0.25	-0.62	-0.48	-0.40	-0.32	-0.78	-0.46	-0.38	-0.66	-0.54	-0.49	-0.39
03/17/08	-0.11	-0.28	-0.31	-0.39	-0.50	-0.36	-0.29	-0.39	-0.36	-0.54	-0.25	-0.25	-0.28	-0.70	-0.60	-0.44	-0.38	-0.89	-0.50	-0.40	-0.68	-0.60	-0.52	-0.43
04/16/08	-0.11	-0.16	-0.18	-0.15	-0.17	-0.14	-0.13	-0.14	-0.13	-0.11	-0.090	-0.090	-0.080	-0.20	-0.16	-0.16	-0.11	-0.24	-0.16	-0.11	-0.19	-0.16	-0.16	-0.11
07/07/08	-0.097	-0.15	-0.15	-0.12	-0.14	-0.13	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.30	-0.26	-0.19	-0.15	-0.41	-0.23	-0.16	-0.33	-0.26	-0.22	-0.16
08/06/08	-0.10	-0.15	-0.15	-0.10	-0.16	-0.11	-0.15[6]	-0.11	-0.11	-0.11	-0.13	-0.13	-0.11	-0.34	-0.24[6]	-0.26	-1.14	-0.39	-0.30	-0.16	-0.32	-0.29[6]	-0.29	-0.16
09/18/08	-0.12	-0.19	-0.20	NM	NM	NM	-0.18	NM	NM	-0.26	-0.14	-0.14	-0.14	NM	NM	NM	-0.19	NM	NM	-0.20	NM	NM	NM	-0.21
10/27/08	-0.097	-0.14	-0.14	NM	NM	NM	-0.14	NM	NM	-0.14	-0.13	-0.13	-0.11	NM	NM	NM	-0.18	NM	NM	-0.18	NM	NM	NM	-0.18
11/25/08	-0.13	-0.19	-0.20	NM	NM	NM	-0.16	NM	NM	-0.16	-0.17	-0.16	-0.15	NM	NM	NM	-0.11	NM	NM	-0.11	NM	NM	NM	-0.11
12/18/08	-0.10	-0.17	-0.20	NM	NM	NM	-0.15	NM	NM	-0.17	-0.20	-0.20	-0.20	NM	NM	NM	-0.11	NM	NM	-0.12	NM	NM	NM	-0.089
03/19/09	-0.15	-0.25	-0.28	NM	NM	NM	-0.22	NM	NM	-0.21	-0.18	-0.18	-0.19	NM	NM	NM	-0.12	NM	NM	-0.12	NM	NM	NM	-0.13
06/26/09	-0.12	-0.16	-0.15	NM	NM	NM	-0.10	NM	NM	-0.12	-0.13	-0.14	-0.12	NM	NM	NM	-0.11	NM	NM	-0.14	NM	NM	NM	-0.20
09/29/09	-0.10	-0.14	-0.15	NM	NM	NM	-0.10	NM	NM	-0.16	-0.15	-0.14	-0.11	NM	NM	NM	-0.12	NM	NM	-0.12	NM	NM	NM	-0.10
12/02/09	-0.10	-0.14	-0.15	NM	NM	NM	-0.10	NM	NM	-0.14	-0.16	-0.15	-0.11	NM	NM	NM	-0.14	NM	NM	-0.14	NM	NM	NM	-0.14
03/12/10[8]	-0.097	-0.16	-0.16	NM	NM	NM	-0.20	NM	NM	-0.13	-0.17	-0.15	-0.12	NM	NM	NM	-0.15	NM	NM	-0.17	NM	NM	NM	-0.17
06/07/10	-0.12	-0.19	-0.19	NM	NM	NM	-0.13	NM	NM	-0.14	-0.13	-0.13	-0.14	NM	NM	NM	-0.13	NM	NM	-0.13	NM	NM	NM	-0.13
08/30/10	-0.10	-0.18	-0.18	NM	NM	NM	-0.10	NM	NM	-0.13	-0.13	-0.14	-0.14	NM	NM	NM	-0.12	NM	NM	-0.12	NM	NM	NM	-0.14
12/03/10	-0.11	-0.18	-0.19	NM	NM	NM	-0.13	NM	NM	-0.13	-0.14	-0.14	-0.14	NM	NM	NM	-0.14	NM	NM	-0.13	NM	NM	NM	-0.14
03/07/11	-0.15	-0.16	-0.17	NM	NM	NM	-0.13[9]	NM	NM	-0.12[9]	-0.14[9]	-0.13[9]	-0.15[9]	NM	NM	NM	-0.19	NM	NM	-0.18	NM	NM	NM	-0.20
06/06/11	-0.088	-0.16	-0.15	NM	NM	NM	-0.11	NM	NM	-0.11	-0.14	-0.14	-0.14	NM	NM	NM	-0.14	NM	NM	-0.15	NM	NM	NM	-0.16
09/19/11	-0.092	-0.11	-0.11	NM	NM	NM	-0.11	NM	NM	-0.10	-0.13	-0.13	-0.13	NM	NM	NM	-0.13	NM	NM	-0.14	NM	NM	NM	-0.14
12/05/11	-0.11	-0.19	-0.20	NM	NM	NM	-0.15	NM	NM	-0.15	-0.11	-0.11	-0.14	NM	NM	NM	-0.13	NM	NM	-0.14	NM	NM	NM	-0.15
03/09/12	-0.10	-0.14	-0.19	NM	NM	NM	-0.13	NM	NM	-0.14	-0.12	-0.11	-0.11	NM	NM	NM	-0.18	NM	NM	-0.18	NM	NM	NM	-0.18
06/04/12	-0.17	-0.19	-0.19[13]	NM	NM	NM	-0.14	NM	NM	-0.18	-0.18	-0.17	-0.18	NM	NM	NM	-0.16	NM	NM	-0.18	NM	NM	NM	-0.18
09/17/12	-0.10	-0.16	-0.15	NM	NM	NM	-0.13	NM	NM	-0.15	-0.13	-0.13	-0.11	NM	NM	NM	-0.13	NM	NM	-0.13	NM	NM	NM	-0.13
12/20/12	-0.12	-0.24	-0.25	NM	NM	NM	-0.13	NM	NM	-0.17	-0.14	-0.14	-0.16	NM	NM	NM	-0.17	NM	NM	-0.17	NM	NM	NM	-0.18
03/28/13	-0.16	-0.16	-0.17	NM	NM	NM	-0.12	NM	NM	-0.14	-0.13	-0.14	-0.11	NM	NM	NM	-0.095	NM	NM	-0.11	NM	NM	NM	-0.11
06/19/13	-0.11	-0.17	-0.16	NM	NM	NM	-0.14	NM	NM	-0.13	-0.15	-0.14	-0.15	NM	NM	NM	-0.18	NM	NM	-0.19	NM	NM	NM	-0.17
09/05/13	-0.11	-0.14	-0.14	NM	NM	NM	-0.12	NM	NM	-0.12	-0.14	-0.14	-0.15	NM	NM	NM	-0.15	NM	NM	-0.16	NM	NM	NM	-0.18
12/04/13	-0.12	-0.19	-0.19	NM	NM	NM	-0.16	NM	NM	-0.15	-0.14	-0.14	-0.15	NM	NM	NM	-0.13	NM	NM	-0.13	NM	NM	NM	-0.14
03/11/14	-0.11	-0.19	-0.16	NM	NM	NM	-0.14	NM	NM	-0.15	-0.14	-0.12	-0.12	NM	NM	NM	-0.13	NM	NM	-0.13	NM	NM	NM	-0.13
06/20/14	-0.10	-0.18	-0.19	NM	NM	NM	-0.10	NM	NM	-0.14	-0.14	-0.13	-0.16	NM	NM	NM	-0.11	NM	NM	-0.12	NM	NM	NM	-0.12
09/10/14	-0.10	-0.16	-0.16	NM	NM	NM	-0.11	NM	NM	-0.11	-0.13	-0.14	-0.15	NM	NM	NM	-0.11	NM	NM	-0.11	NM	NM	NM	-0.11
12/10/14	-0.13	-0.20	-0.20	NM	NM	NM	-0.16	NM	NM	-0.17	-0.16	-0.14	-0.16	NM	NM	NM	-0.16	NM	NM	-0.17	NM	NM	NM	-0.18

Notes and abbreviations on last page.

Table 2. Summary of Induced Vacuum Readings at Compliance Monitoring Points, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2]

Well ID:		DW-1D					DW-4D	DW-8S		DW-2S								DW-2D							DW-11S	
Date		VMWC-1D	VMWC-2D	VMWC-4D	VMWC-3D [3]	VMWC-16D [3]	VMWC-16A [3]	VMWC-16B [3]	VMWC-5A	VMWC-6A	VMWC-8A	VMWC-7A [3]	VMWC-5B	VMWC-6B	VMWC-8B	VMWC-7B [3]	VMWC-5D	VMWC-6D	VMWC-8D	VMWC-7D	VMWC-13D [3]	VMWC-17D [3]	VMWC-18A [3]	VMWC-18B [3]
02/18/08		-1.2	-0.99	-0.16	-0.90	-0.51	-0.040	-0.10	-0.070	-0.040	-0.40	-0.080	-0.10	-0.050	-0.020	-0.030	-1.9	-1.5	-0.030[4]	-1.0	-0.17	-0.39	-0.050	-0.070
02/19/08		-1.3	-1.1	-0.86	-0.96	-0.54	-0.26	-0.26	-0.62	-0.37	-0.29	-0.22	-0.74	-1.73	-0.33	-0.23	-2.2	-0.37[4]	-1.9	-1.4	-0.44	-0.53	-0.25	-0.26[5]
02/25/08		-1.6	-1.2	-0.97	-1.1	-0.39	-0.29	-0.30	-0.70	-0.42	-0.31	-0.28	-0.82	-0.46	-0.35	-0.29	-1.2	-1.1	-0.88	-0.89	-0.39	-0.22	-0.24	-0.30
03/03/08		-1.6	-1.2	-0.90	-0.98	-0.27	-0.26	-0.27	-0.68	-0.40	-0.31	-0.27	-0.83	-0.44	-0.35	-0.30	-0.90	-0.72	-0.65	-0.53	-0.24	-0.16	-0.24	-0.27
03/17/08		-1.7	-1.5	-0.96	-1.2	-0.43	-0.31	-0.35	-0.69	-0.41	-0.33	-0.25	-0.78	-0.42	-0.36	-0.28	-1.2	-0.92	-0.82	-0.65	NM	-0.25	-0.29	-0.34
04/16/08		-0.18	-0.15	-0.18	-0.13	-0.090	-0.080	-0.080	-0.26	-0.14	NM	-0.090	-0.22	-0.15	NM	-0.090	-0.23	-0.21	NM	-0.17	NM	-0.08	-0.080	-0.090
07/07/08		-0.37	-0.27	-0.24	-0.31	-0.17	-0.16	-0.17	-0.31	-0.19	-0.16	-0.14	-0.34	-0.20	-0.17	-0.15	-1.0	-0.85	-0.76	-0.50	-0.19	NM	-0.13	-0.16
08/06/08		-0.32	-0.27	-0.30	-0.22	-0.14	-0.14	-0.16	-0.24	-0.19	-0.19	-0.16	-0.34	-0.20	-0.19	-0.15	-0.95	-0.77	-0.75	-0.55	-0.19	-0.17	-0.13	-0.16
09/18/08		NM	NM	NM	-0.34	-0.26	-0.17	-0.18	NM	NM	NM	-0.22	NM	NM	NM	-0.17	NM	NM	NM	NM	-0.39	-0.22	-0.13	-0.16
10/27/08		NM	NM	NM	-0.24	-0.14	-0.15	-0.16	NM	NM	NM	-0.14	NM	NM	NM	-0.14	NM	NM	NM	NM	-0.23	-0.68	-0.13	-0.13
11/25/08		NM	NM	NM	-0.12	-0.12	-0.18	-0.19	NM	NM	NM	-0.19	NM	NM	NM	-0.19	NM	NM	NM	NM	-0.10	-0.17	-0.15	-0.18
12/18/08		NM	NM	NM	-0.11	-0.06	-0.15	-0.17	NM	NM	NM	-0.15	NM	NM	NM	-0.16	NM	NM	NM	NM	-0.14	-0.22	-0.13	-0.16
03/19/09		NM	NM	NM	-0.28	-0.15	-0.13	-0.15	NM	NM	NM	-0.16	NM	NM	NM	-0.15	NM	NM	NM	NM	-0.36	-0.31	-0.14	-0.17
06/26/09		NM	NM	NM	-0.12	-0.16	-0.21	-0.22	NM	NM	NM	-0.10	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.86	-0.11	-0.12	-0.13
09/29/09		NM	NM	NM	-0.18	-0.19	-0.16	-0.17	NM	NM	NM	-0.10	NM	NM	NM	-0.095	NM	NM	NM	NM	-0.19	-0.18	-0.10	-0.12
12/02/09		NM	NM	NM	-0.18	-0.10	-0.14	-0.15	NM	NM	NM	0.010[7]	NM	NM	NM	-0.10	NM	NM	NM	NM	-0.23	-0.30	-0.13	-0.14
03/12/10	[8]	NM	NM	NM	-0.19	-0.30	-0.21	-0.22	NM	NM	NM	-0.12	NM	NM	NM	-0.14	NM	NM	NM	NM	-0.25	-0.31	-0.13	-0.15
06/07/10		NM	NM	NM	-0.20	-0.20	-0.18	-0.20	NM	NM	NM	-0.12	NM	NM	NM	-0.13	NM	NM	NM	NM	-0.23	-0.19	-0.10	-0.17
08/30/10		NM	NM	NM	-0.21	-0.19	-0.17	-0.18	NM	NM	NM	-0.095	NM	NM	NM	-0.12	NM	NM	NM	NM	-0.13	-0.15	-0.093	-0.12
12/03/10		NM	NM	NM	-0.16	-0.12	-0.13	-0.18	NM	NM	NM	-0.091	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.14	-0.10	-0.054	-0.26
03/07/11		NM	NM	NM	-0.31	-0.19[9]	-0.23	-0.22	NM	NM	NM	-0.34	NM	NM	NM	-0.24	NM	NM	NM	NM	-0.22	-0.25	-0.048	-0.19
06/06/11		NM	NM	NM	-0.21	-0.23	-0.070	-0.19	NM	NM	NM	-0.10	NM	NM	NM	-0.12	NM	NM	NM	NM	-0.28	-0.24	-0.11	-0.17
09/19/11		NM	NM	NM	-0.20	-0.20	-0.19	-0.21	NM	NM	NM	-0.12	NM	NM	NM	-0.13	NM	NM	NM	NM	-0.17	-0.27	-0.10	-0.12
12/05/11		NM	NM	NM	-0.22	-0.21	-0.18	-0.20	NM	NM	NM	-0.10[10]	NM	NM	NM	-0.10[10]	NM	NM	NM	NM	-0.25	-0.23	-0.048	-0.039[11]
03/09/12		NM	NM	NM	-0.19	-0.19	-0.21	-0.17	NM	NM	NM	-0.098	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.18	-0.28[12]	-0.15	-0.13
06/04/12		NM	NM	NM	-0.19[13]	-0.20[13]	-0.19[13]	-0.21	NM	NM	NM	-0.12	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.19	-0.23	-0.13	-0.13
09/17/12		NM	NM	NM	-0.14	-0.13	-0.17	-0.14	NM	NM	NM	-0.091	NM	NM	NM	-0.10	NM	NM	NM	NM	-0.15	-0.16	-0.095	-0.10
12/20/12		NM	NM	NM	-0.14	-0.12	-0.20	-0.20	NM	NM	NM	-0.093	NM	NM	NM	-0.096	NM	NM	NM	NM	-0.20	-0.12	-0.026	-0.048
03/28/13		NM	NM	NM	-0.14	-0.18	-0.14[14]	-0.18	NM	NM	NM	-0.11	NM	NM	NM	-0.13	NM	NM	NM	NM	-0.18	-0.24	-0.096	-0.11
06/19/13		NM	NM	NM	-0.27	-0.25	-0.17	-0.18	NM	NM	NM	-0.12	NM	NM	NM	-0.13	NM	NM	NM	NM	-0.16	-0.26	-0.10	-0.13
09/05/13		NM	NM	NM	-0.21[15]	-0.21[15]	-0.11	-0.13	NM	NM	NM	-0.10	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.27	-0.20	-0.10	-0.11
12/04/13		NM	NM	NM	-0.20	-0.20	-0.14	-0.14	NM	NM	NM	-0.093	NM	NM	NM	-0.098	NM	NM	NM	NM	-0.22[16]	-0.15	-0.10	-0.10
03/11/14		NM	NM	NM	-0.20	-0.13	-0.18[17]	-0.18[17]	NM	NM	NM	-0.10	NM	NM	NM	-0.12	NM	NM	NM	NM	-0.12[18]	-0.19[18]	-0.13	-0.15
06/20/14		NM	NM	NM	-0.19	-0.16	-0.15	-0.16	NM	NM	NM	-0.13	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.13	-0.18	-0.093	-0.11
09/10/14		NM	NM	NM	-0.14	-0.19	-0.14	-0.16	NM	NM	NM	-0.11	NM	NM	NM	-0.11	NM	NM	NM	NM	-0.11	-0.26	-0.096	-0.12
12/10/14		NM	NM	NM	-0.15	-0.17	-0.21	-0.21	NM	NM	NM	-0.14	NM	NM	NM	-0.13	NM	NM	NM	NM	-0.19	-0.15	-0.16	-0.13

Notes and abbreviations on last page.

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Table 2. Summary of Induced Vacuum Readings at Compliance Monitoring Points, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.(1,2)

Notes and Abbreviations:

--	Not applicable.
DW	Depressurization well.
NM	Not measured.
VMWC	Vacuum monitoring well cluster.
iwc	Inches of water column.

1. All induced vacuum measurements units in iwc. Values shown have been rounded to include two significant figures.
2. Compliance goal is -0.1 iwc of vacuum at all compliance monitoring points, based on a twelve-month rolling average.
3. Compliance related monitoring point.
4. Data point appears to be erroneous based on vacuum readings at further vapor point greater than that recorded at the closer location.
5. Data point is average of readings taken which fluctuated between -0.22 and -0.29 iwc.
6. Original parameter collected on 8/6/08 was erroneous, data point reported is second reading taken on 08/07/08.
7. Suspected field recording error.
8. Readings shown were collected between March 11, and 12, 2010.
9. Values were remeasured on March 14, 2011 due to erroneous values recorded on March 7, 2011.
10. Values were remeasured on December 6, 2011 due to erroneous values recorded on December 5, 2011.
11. Value was remeasured on December 22, 2011 due to erroneous values recorded on December 5 and 6, 2011.
12. Value was measured on March 21, 2012. This value was inadvertently not recorded on March 9, 2012 due to operator error.
13. Values were remeasured on June 14, 2012 due to erroneous values recorded on June 4, 2012.
14. Value was remeasured on April 5, 2013 due to erroneous values recorded on March 28, 2013.
15. Value was remeasured on September 25, 2013 due to an erroneous value recorded on September 5, 2013.
16. Value was remeasured on December 16, 2013 due to an erroneous value recorded on December 4, 2013.
17. Value was remeasured on March 21, 2014 due to well inaccessability in March 11, 2014.
18. Value was remeasured on March 21, 2014 due to an erroneous value recorded on March 11, 2014.

Table 3. Summary of Time-Weighted Rolling Averages at Compliance Monitoring Points, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2]

Well ID:	DW-7S			DW-7D	DW-3S				DW-3D				DW-5S			DW-5D	DW-1S											
Date	VMWC-14A [3]	VMWC-14B [3]	VMWC-14D [3]	VMWC-9A	VMWC-9B	VMWC-10B	VMWC-11B [3]	VMWC-10D	VMWC-11D	VMWC-12D [3]	VMWC-15A [3]	VMWC-15B [3]	VMWC-15D [3]	VMWC-1A	VMWC-2A	VMWC-4A	VMWC-3A [3]	VMWC-1B	VMWC-4B	VMWC-3B [3]	VMWC-1C	VMWC-2C	VMWC-4C	VMWC-3C [3]
12/18/08	-0.11	-0.17	-0.19	--	--	--	-0.17	--	--	-0.18	-0.15	-0.15	-0.15	--	--	--	-0.28	--	--	-0.19	--	--	--	-0.19
03/19/09	-0.12	-0.19	-0.20	--	--	--	-0.17	--	--	-0.18	-0.15	-0.15	-0.15	--	--	--	-0.24	--	--	-0.17	--	--	--	-0.17
06/26/09	-0.12	-0.18	-0.19	--	--	--	-0.15	--	--	-0.16	-0.15	-0.15	-0.14	--	--	--	-0.21	--	--	-0.15	--	--	--	-0.16
09/29/09	-0.12	-0.18	-0.19	--	--	--	-0.14	--	--	-0.16	-0.15	-0.15	-0.14	--	--	--	-0.12	--	--	-0.13	--	--	--	-0.14
12/02/09	-0.12	-0.17	-0.18	--	--	--	-0.13	--	--	-0.16	-0.15	-0.15	-0.13	--	--	--	-0.12	--	--	-0.13	--	--	--	-0.14
03/12/10	-0.11	-0.15	-0.15	--	--	--	-0.13	--	--	-0.14	-0.15	-0.15	-0.11	--	--	--	-0.13	--	--	-0.14	--	--	--	-0.15
06/07/10	-0.10	-0.16	-0.16	--	--	--	-0.14	--	--	-0.14	-0.15	-0.14	-0.12	--	--	--	-0.14	--	--	-0.14	--	--	--	-0.14
08/30/10	-0.11	-0.17	-0.17	--	--	--	-0.14	--	--	-0.14	-0.15	-0.14	-0.13	--	--	--	-0.13	--	--	-0.14	--	--	--	-0.15
12/03/10	-0.11	-0.18	-0.18	--	--	--	-0.14	--	--	-0.13	-0.14	-0.14	-0.14	--	--	--	-0.14	--	--	-0.14	--	--	--	-0.14
03/07/11	-0.12	-0.18	-0.18	--	--	--	-0.12	--	--	-0.13	-0.14	-0.13	-0.14	--	--	--	-0.15	--	--	-0.14	--	--	--	-0.15
06/06/11	-0.11	-0.17	-0.17	--	--	--	-0.12	--	--	-0.12	-0.14	-0.14	-0.14	--	--	--	-0.15	--	--	-0.15	--	--	--	-0.16
09/19/11	-0.11	-0.15	-0.15	--	--	--	-0.12	--	--	-0.12	-0.14	-0.13	-0.14	--	--	--	-0.15	--	--	-0.15	--	--	--	-0.16
12/05/11	-0.11	-0.15	-0.16	--	--	--	-0.12	--	--	-0.12	-0.13	-0.13	-0.14	--	--	--	-0.15	--	--	-0.15	--	--	--	-0.16
03/09/12	**-0.096**	-0.15	-0.16	--	--	--	-0.12	--	--	-0.12	-0.13	-0.12	-0.13	--	--	--	-0.15	--	--	-0.15	--	--	--	-0.16
06/04/12	-0.12	-0.16	-0.17	--	--	--	-0.13	--	--	-0.14	-0.13	-0.13	-0.14	--	--	--	-0.15	--	--	-0.16	--	--	--	-0.16
09/17/12	-0.12	-0.17	-0.18	--	--	--	-0.14	--	--	-0.15	-0.14	-0.13	-0.13	--	--	--	-0.15	--	--	-0.16	--	--	--	-0.16
12/20/12	-0.12	-0.18	-0.19	--	--	--	-0.13	--	--	-0.16	-0.14	-0.14	-0.14	--	--	--	-0.16	--	--	-0.16	--	--	--	-0.17
03/28/13	-0.14	-0.19	-0.19	--	--	--	-0.13	--	--	-0.16	-0.14	-0.14	-0.14	--	--	--	-0.14	--	--	-0.15	--	--	--	-0.15
06/19/13	-0.12	-0.18	-0.18	--	--	--	-0.13	--	--	-0.15	-0.14	-0.14	-0.13	--	--	--	-0.14	--	--	-0.15	--	--	--	-0.15
09/05/13	-0.13	-0.18	-0.18	--	--	--	-0.13	--	--	-0.14	-0.14	-0.14	-0.14	--	--	--	-0.15	--	--	-0.16	--	--	--	-0.16
12/04/13	-0.13	-0.17	-0.16	--	--	--	-0.14	--	--	-0.13	-0.14	-0.14	-0.14	--	--	--	-0.14	--	--	-0.14	--	--	--	-0.15
03/11/14	-0.11	-0.18	-0.16	--	--	--	-0.14	--	--	-0.14	-0.14	-0.13	-0.14	--	--	--	-0.14	--	--	-0.15	--	--	--	-0.15
06/20/14	-0.11	-0.18	-0.17	--	--	--	-0.13	--	--	-0.14	-0.14	-0.13	-0.14	--	--	--	-0.13	--	--	-0.13	--	--	--	-0.14
09/10/14	-0.11	-0.18	-0.18	--	--	--	-0.13	--	--	-0.14	-0.14	-0.13	-0.14	--	--	--	-0.12	--	--	-0.12	--	--	--	-0.13
12/10/14	-0.11	-0.18	-0.18	--	--	--	-0.13	--	--	-0.14	-0.14	-0.13	-0.15	--	--	--	-0.13	--	--	-0.13	--	--	--	-0.14

Notes and abbreviations on last page.

Table 3. Summary of Time-Weighted Rolling Averages at Compliance Monitoring Points, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2]

Well ID:	DW-1D					DW-4D	DW-8S	DW-2S								DW-2D							DW-11S	
Date	VMWC-1D	VMWC-2D	VMWC-4D	VMWC-3D [3]	VMWC-16D [3]	VMWC-16A [3]	VMWC-16B [3]	VMWC-5A	VMWC-6A	VMWC-8A	VMWC-7A [3]	VMWC-5B	VMWC-6B	VMWC-8B	VMWC-7B [3]	VMWC-5D	VMWC-6D	VMWC-8D	VMWC-7D	VMWC-13D [3]	VMWC-17D [3]	VMWC-18A [3]	VMWC-18B [3]
12/18/08	--	--	--	-0.32	-0.18	-0.16	-0.18	--	--	--	-0.17	--	--	--	-0.16	--	--	--	--	-0.19	-0.22	-0.14	-0.17
03/19/09	--	--	--	-0.28	-0.16	-0.15	-0.17	--	--	--	-0.16	--	--	--	-0.16	--	--	--	--	-0.23	-0.24	-0.14	-0.16
06/26/09	--	--	--	-0.22	-0.16	-0.16	-0.18	--	--	--	-0.15	--	--	--	-0.15	--	--	--	--	-0.42	-0.23	-0.13	-0.15
09/29/09	--	--	--	-0.19	-0.15	-0.17	-0.18	--	--	--	-0.13	--	--	--	-0.13	--	--	--	--	-0.40	-0.25	-0.12	-0.14
12/02/09	--	--	--	-0.19	-0.16	-0.16	-0.18	--	--	--	**-0.095**	--	--	--	-0.12	--	--	--	--	-0.43	-0.22	-0.12	-0.14
03/12/10	--	--	--	-0.16	-0.20	-0.18	-0.19	--	--	--	**-0.086**	--	--	--	-0.11	--	--	--	--	-0.40	-0.22	-0.12	-0.13
06/07/10	--	--	--	-0.19	-0.21	-0.17	-0.19	--	--	--	**-0.091**	--	--	--	-0.12	--	--	--	--	-0.23	-0.24	-0.11	-0.14
08/30/10	--	--	--	-0.19	-0.21	-0.18	-0.19	--	--	--	**-0.089**	--	--	--	-0.12	--	--	--	--	-0.21	-0.24	-0.11	-0.15
12/03/10	--	--	--	-0.19	-0.20	-0.17	-0.20	--	--	--	-0.11	--	--	--	-0.12	--	--	--	--	-0.19	-0.19	**-0.094**	-0.18
03/07/11	--	--	--	-0.22	-0.17	-0.17	-0.20	--	--	--	-0.16	--	--	--	-0.15	--	--	--	--	-0.18	-0.17	**-0.073**	-0.19
06/06/11	--	--	--	-0.22	-0.18	-0.15	-0.19	--	--	--	-0.16	--	--	--	-0.15	--	--	--	--	-0.19	-0.19	**-0.076**	-0.18
09/19/11	--	--	--	-0.22	-0.19	-0.16	-0.20	--	--	--	-0.16	--	--	--	-0.15	--	--	--	--	-0.20	-0.22	**-0.078**	-0.18
12/05/11	--	--	--	-0.23	-0.21	-0.17	-0.21	--	--	--	-0.17	--	--	--	-0.15	--	--	--	--	-0.23	-0.25	**-0.078**	-0.13
03/09/12	--	--	--	-0.20	-0.21	-0.16	-0.19	--	--	--	-0.11	--	--	--	-0.12	--	--	--	--	-0.22	-0.26	-0.10	-0.12
06/04/12	--	--	--	-0.20	-0.20	-0.19	-0.20	--	--	--	-0.11	--	--	--	-0.11	--	--	--	--	-0.20	-0.25	-0.11	-0.11
09/17/12	--	--	--	-0.18	-0.18	-0.19	-0.18	--	--	--	-0.10	--	--	--	-0.11	--	--	--	--	-0.19	-0.22	-0.11	-0.10
12/20/12	--	--	--	-0.16	-0.16	-0.19	-0.18	--	--	--	**-0.099**	--	--	--	-0.10	--	--	--	--	-0.18	-0.20	**-0.099**	-0.10
03/28/13	--	--	--	-0.15	-0.15	-0.17	-0.18	--	--	--	-0.10	--	--	--	-0.11	--	--	--	--	-0.18	-0.19	**-0.086**	**-0.097**
06/19/13	--	--	--	-0.17	-0.16	-0.17	-0.18	--	--	--	-0.10	--	--	--	-0.11	--	--	--	--	-0.17	-0.19	**-0.080**	**-0.097**
09/05/13	--	--	--	-0.18	-0.18	-0.16	-0.18	--	--	--	-0.11	--	--	--	-0.11	--	--	--	--	-0.20	-0.20	**-0.081**	-0.10
12/04/13	--	--	--	-0.20	-0.21	-0.14	-0.16	--	--	--	-0.11	--	--	--	-0.12	--	--	--	--	-0.20	-0.21	-0.10	-0.11
03/11/14	--	--	--	-0.22	-0.20	-0.15	-0.16	--	--	--	-0.10	--	--	--	-0.11	--	--	--	--	-0.19	-0.20	-0.11	-0.13
06/20/14	--	--	--	-0.20	-0.17	-0.15	-0.15	--	--	--	-0.11	--	--	--	-0.11	--	--	--	--	-0.18	-0.18	-0.11	-0.12
09/10/14	--	--	--	-0.18	-0.17	-0.15	-0.16	--	--	--	-0.11	--	--	--	-0.11	--	--	--	--	-0.15	-0.20	-0.11	-0.12
12/10/14	--	--	--	-0.17	-0.16	-0.17	-0.18	--	--	--	-0.12	--	--	--	-0.12	--	--	--	--	-0.14	-0.19	-0.12	-0.13

Notes and abbreviations on last page.

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Table 3. Summary of Time-Weighted Rolling Averages at Compliance Monitoring Points, Northrop Grumman Operable Unit 3 Bethpage Park Soil Gas Containment System Former Grumman Settling Ponds, Bethpage, New York.(1,2)

Notes and Abbreviations:

	Indicates well does not meet USEPA radon guidance of -0.035 iwc on a twelve-month rolling average.
BOLD	Indicates well does not meet compliance criteria of -0.1 iwc on a twelve-month rolling average.
--	Not applicable.
DW	Depressurization well.
iwc	Inches of water column.
VMWC	Vacuum monitoring well cluster.
USEPA	United States Environmental Protection Agency

1. All induced vacuum measurements units in iwc. Values shown have been rounded to include two significant figures.
2. Compliance goal is -0.1 iwc of vacuum at all compliance monitoring points, based on a twelve-month rolling average.
3. Compliance related monitoring point.
4. Time weighted rolling average calculated by summing the products of the instantaneous induced vacuum readings and the number of days between readings for a 12-month monitoring period, and dividing by the total number of days between the first and last set of readings for a 12-month monitoring period.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)	CAS No.	SGC	Sample ID: VSP-601 Sample Date: 2/18/2008	VSP-602 2/18/2008	VSP-601 2/19/2008	VSP-602 2/19/2008	VSP-601 2/25/2008	VSP-602 2/25/2008	VSP-601 3/3/2008	VSP-602 3/3/2008
Project VOCs										
1,1,1-Trichloroethane	71-55-6	9,000	**110**	< 0.62 U	**71**	< 0.61 U	**35**	< 0.63 U	**26**	< 0.63 U
1,1-Dichloroethane	75-34-3	NS	**43**	< 0.62 U	**33**	< 0.61 U	**45**	< 0.63 U	**47**	< 0.63 U
1,1-Dichloroethene	75-35-4	380[4]	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Benzene	71-43-2	1,300	**67**	< 0.62 U	**22**	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**5,800**	< 0.62 U	**4,600**	< 0.61 U	**2,900**	< 0.63 U	**1,600**	< 0.63 U
Tetrachloroethene	127-18-4	300	**340**	< 0.62 U	**200**	< 0.61 U	**82**	< 0.63 U	**45**	< 0.63 U
Toluene	108-88-3	37,000	**92**	< 0.62 U	**98**	< 0.61 U	**34**	< 0.63 U	**61**	< 0.63 U
trans-1,2-Dichloroethene	156-60-5	190,000[5]	**120**	< 0.62 U	**71**	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Trichloroethylene	79-01-6	14,000	**14,000**	< 0.62 U	**9,400**	< 0.61 U	**5,100**	< 0.63 U	**2,500**	< 0.63 U
Vinyl chloride	75-01-4	180,000	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	**1.1**	**200**	**40**
Xylenes - M,P	1330-20-7	22,000	< 28 U	< 1.2 U	< 21 U	< 1.2 U	< 51 U	< 1.3 U	< 13 U	< 0.63 U
Subtotal Project VOCs			**20,572**	0	**14,495**	0	**8,196**	**1.1**	**4,479**	**40**
Non-Project VOCs										
2-Butanone	78-93-3	13,000	**16**	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
2-Hexanone	591-78-6	4,000	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	--	--	--	--	--	--	--	--
Acetone	67-64-1	180,000	< 140 U	< 6.2 U	< 110 U	< 6.1 U	< 250 U	< 6.3 U	< 130 U	< 6.3 U
Bromodichloromethane	75-27-4	NS	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Bromoform	75-25-2	NS	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Carbon Disulfide	75-15-0	6,200	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Carbon Tetrachloride	56-23-5	1,900	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Chlorodibromomethane	124-48-1	NS	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	--	--	--	--	--	--	--	--
Chloroform	67-66-3	150	**34**	< 0.62 U	**24**	< 0.61 U	< 25 U	< 0.63 U	**27**	< 0.63 U
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	< 14 U	< 0.62 U	< 11 U	**0.71**	< 25 U	**5.7**	**13**	**8.3**
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Methylene Chloride	75-09-2	14,000	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U	< 0.63 U	< 13 U	< 0.63 U
Subtotal Non-Project VOCs			**50**	0	**24**	**0.71**	0	**5.7**	**40**	**8.3**
TVOC[3]			**20,622**	0	**14,519**	**0.71**	**8,196**	**6.8**	**4,519**	**48**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)	CAS No.	Sample ID: / Sample Date:	VSP-601 3/17/2008	VSP-602 3/17/2008	VSP-601 4/16/2008	VSP-602 4/16/2008	VSP-601 5/19/2008	VSP-602 5/19/2008	VSP-601 6/2/2008	VSP-602 6/2/2008
Project VOCs	CAS No.	SGC								
1,1,1-Trichloroethane	71-55-6	9,000	**35**	< 14 U	< 25 U	< 26 U	**38**	< 2.7 U	**44**	< 2.5 U
1,1-Dichloroethane	75-34-3	NS	**59**	< 11 U	**31**	< 19 U	**25**	**5.8**	**27**	**7.6**
1,1-Dichloroethene	75-35-4	380[4]	< 10 U	< 10 U	< 18 U	< 19 U	< 19 U	< 1.9 U	< 18 U	< 1.8 U
Benzene	71-43-2	1,300	< 8.4 U	< 8.4 U	< 14 U	< 15 U	**19**	< 1.6 U	< 15 U	< 1.5 U
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**1,400 D**	< 10 U	**1,100**	**79**	**950**	**180**	**930**	**230 D**
Tetrachloroethene	127-18-4	300	**39**	< 3.6 U	**54**	< 6.4 U	**42**	< 0.67 U	**48**	**2.2**
Toluene	108-88-3	37,000	**140**	< 10 U	**37**	< 18 U	< 18 U	< 1.8 U	< 17 U	< 1.7 U
trans-1,2-Dichloroethene	156-60-5	190,000[5]	**10**	< 10 U	< 18 U	< 19 U	< 19 U	< 1.9 U	< 18 U	**2.8**
Trichloroethylene	79-01-6	14,000	**1,500 D**	< 2.8 U	**1,300**	< 5.0 U	**1,000**	**5.3**	**1,100**	**6.5**
Vinyl chloride	75-01-4	180,000	**980 D**	**920 D**	**120**	**710**	< 12 U	**65**	< 12 U	**13**
Xylenes - M,P	1330-20-7	22,000	< 46 U	< 46 U	< 79 U	< 81 U	< 84 U	< 8.5 U	< 80 U	< 8.0 U
Subtotal Project VOCs			**4,163**	**920**	**2,642**	**789**	**2,074**	**256**	**2,149**	**262**
Non-Project VOCs										
2-Butanone	78-93-3	13,000	< 16 U	< 16 U	< 27 U	< 28 U	< 28 U	< 2.9 U	**28**	< 2.7 U
2-Hexanone	591-78-6	4,000	< 11 U	< 11 U	< 19 U	< 19 U	< 20 U	< 2.0 U	< 19 U	< 1.9 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	--	--	--	--	--	--	--	--
Acetone	67-64-1	180,000	< 31 U	< 31 U	< 54 U	< 56 U	< 57 U	< 5.8 U	< 55 U	**8.4**
Bromodichloromethane	75-27-4	NS	< 3.5 U	< 3.5 U	< 6.1 U	< 6.3 U	< 6.5 U	< 0.66 U	< 6.2 U	< 0.62 U
Bromoform	75-25-2	NS	< 27 U	< 27 U	< 47 U	< 48 U	< 50 U	< 5.1 U	< 48 U	< 4.8 U
Carbon Disulfide	75-15-0	6,200	< 8.2 U	< 8.2 U	< 14 U	< 15 U	< 15 U	< 1.5 U	< 14 U	< 1.4 U
Carbon Tetrachloride	56-23-5	1,900	< 3.3 U	< 3.3 U	< 5.7 U	< 5.9 U	< 6.1 U	< 0.62 U	< 5.8 U	< 0.58 U
Chlorodibromomethane	124-48-1	NS	< 4.5 U	< 4.5 U	< 7.7 U	< 8.0 U	< 8.2 U	< 0.84 U	< 7.8 U	< 0.78 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	--	--	--	--	--	--	--	--
Chloroform	67-66-3	150	**35**	< 13 U	< 22 U	< 23 U	**44**	< 2.4 U	**55**	**3.0**
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	**46**	< 26 U	< 45 U	< 46 U	< 48 U	< 4.9 U	< 45 U	< 4.5 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	< 4.0 U	< 4.0 U	< 6.9 U	< 7.2 U	< 7.4 U	< 0.75 U	< 7.0 U	< 0.70 U
Methylene Chloride	75-09-2	14,000	< 9.2 U	< 9.2 U	< 16 U	< 16 U	< 17 U	< 1.7 U	< 16 U	< 1.6 U
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	< 15 U	< 15 U	< 25 U	< 26 U	< 27 U	< 2.8 U	< 26 U	< 2.6 U
Subtotal Non-Project VOCs			**81**	0	0	0	**44**	0	**83**	**11**
TVOC[3]			**4,244**	**920**	**2,642**	**789**	**2,118**	**256**	**2,232**	**274**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)	CAS No.	Sample ID: / Sample Date:	VSP-601 7/7/2008	VSP-602 7/7/2008	VSP-601 8/6/2008	VSP-602 8/6/2008	VSP-601 9/24/2008	VSP-602 9/24/2008	VSP-601 10/27/2008	VSP-602 10/27/2008
Project VOCs	CAS No.	SGC								
1,1,1-Trichloroethane	71-55-6	9,000	**48**	< 6.5 U	**47**	< 4.4 U	**77**	**9.7**	**61**	< 15 U
1,1-Dichloroethane	75-34-3	NS	**28**	**11**	**26**	**9.2**	**47**	**26**	**33**	**30**
1,1-Dichloroethene	75-35-4	380[4]	< 18 U	< 4.7 U	< 22 U	< 3.2 U	< 21 U	**3.5**	< 14 U	< 11 U
Benzene	71-43-2	1,300	**150**	< 3.8 U	**22**	< 2.6 U	< 17 U	< 1.7 U	< 11 U	< 8.5 U
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**1,100**	**350**	**990**	**320 D**	**1,500**	**620 D**	**1,100**	**830**
Tetrachloroethene	127-18-4	300	**61**	< 1.6 U	**56**	< 1.1 U	**64**	**0.88**	**32**	< 3.6 U
Toluene	108-88-3	37,000	< 17 U	< 4.5 U	< 20 U	< 3.0 U	< 20 U	< 2.0 U	< 13 U	< 10 U
trans-1,2-Dichloroethene	156-60-5	190,000[5]	< 18 U	< 4.7 U	< 22 U	**3.6**	< 21 U	**8.6**	< 14 U	< 11 U
Trichloroethylene	79-01-6	14,000	**1,500**	**7.7**	**1,400**	**9.2**	**1,500**	**120**	**1,100**	**120**
Vinyl chloride	75-01-4	180,000	< 11 U	**5.9**	< 14 U	**4.9**	< 14 U	**4.9**	< 8.8 U	< 6.8 U
Xylenes - M,P	1330-20-7	22,000	< 77 U	< 21 U	< 94 U	< 14 U	< 92 U	< 9.3 U	< 60 U	< 46 U
Subtotal Project VOCs			**2,887**	**375**	**2,541**	**347**	**3,188**	**794**	**2,326**	**980**
Non-Project VOCs										
2-Butanone	78-93-3	13,000	**27**	< 7.0 U	< 32 U	< 4.7 U	< 31 U	< 3.2 U	< 20 U	< 16 U
2-Hexanone	591-78-6	4,000	< 18 U	< 4.9 U	< 22 U	< 3.3 U	< 22 U	< 2.2 U	< 14 U	< 11 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	--	--	--	--	--	--	--	--
Acetone	67-64-1	180,000	< 53 U	< 14 U	< 65 U	< 9.6 U	< 63 U	< 6.3 U	< 41 U	< 32 U
Bromodichloromethane	75-27-4	NS	< 6.0 U	< 1.6 U	< 7.3 U	< 1.1 U	< 7.1 U	< 0.72 U	< 4.6 U	< 3.6 U
Bromoform	75-25-2	NS	< 46 U	< 12 U	< 56 U	< 8.3 U	< 55 U	< 5.5 U	< 36 U	< 28 U
Carbon Disulfide	75-15-0	6,200	< 14 U	< 3.7 U	< 17 U	< 2.5 U	< 17 U	< 1.7 U	< 11 U	< 8.3 U
Carbon Tetrachloride	56-23-5	1,900	< 5.6 U	< 1.5 U	< 6.8 U	< 1.0 U	< 6.7 U	< 0.67 U	< 4.3 U	< 3.3 U
Chlorodibromomethane	124-48-1	NS	< 7.6 U	< 2.0 U	< 9.3 U	< 1.4 U	< 9.1 U	< 0.91 U	< 5.9 U	< 4.5 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	--	--	--	--	--	--	--	--
Chloroform	67-66-3	150	**88**	**8.4**	**89**	**8.2**	**160**	**35**	**95**	**45**
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	< 44 U	< 12 U	< 54 U	< 8.0 U	< 53 U	< 5.3 U	< 34 U	< 26 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	< 6.8 U	< 1.8 U	< 8.3 U	< 1.2 U	< 8.2 U	< 0.82 U	< 5.3 U	< 4.1 U
Methylene Chloride	75-09-2	14,000	< 15 U	< 4.1 U	< 19 U	< 2.8 U	< 18 U	< 1.9 U	< 12 U	< 9.2 U
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	< 25 U	< 6.7 U	< 31 U	**5.5**	< 30 U	**11**	< 19 U	< 15 U
Subtotal Non-Project VOCs			**115**	**8.4**	**89**	**14**	**160**	**46**	**95**	**45**
TVOC[3]			**3,002**	**383**	**2,630**	**361**	**3,348**	**840**	**2,421**	**1,025**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)		Sample ID:	VSP-601	VSP-602	VSP-601	VSP-602	VSP-601	VSP-601	VSP-601	VSP-601
		Sample Date:	11/25/2008	11/25/2008	12/18/2008	12/18/2008	3/19/2009	6/26/2009	9/29/2009	12/2/2009
Project VOCs	CAS No.	SGC								
1,1,1-Trichloroethane	71-55-6	9,000	**68**	**23**	**75 J**	< 18 U	**57 J**	**24**	**26**	**22**
1,1-Dichloroethane	75-34-3	NS	**38**	**32**	**33 J**	**29**	**30 J**	**17**	**19**	**16**
1,1-Dichloroethene	75-35-4	380[4]	< 20 U	< 13 U	< 12 UJ	< 13 U	< 12 UJ	**3.9**	**3.9**	**3.8**
Benzene	71-43-2	1,300	**43**	< 10 U	**63 J**	< 10 U	**15 J**	**120**	**14**	**140**
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**1,200**	**770**	**1,000 J**	**730**	**1,400 DJ**	**960 D**	**900 D**	**600 D**
Tetrachloroethene	127-18-4	300	**31**	< 4.3 U	**21 J**	< 4.4 U	**24 J**	**22**	**31**	**19**
Toluene	108-88-3	37,000	< 19 U	< 12 U	**12 J**	< 12 U	**11 J**	< 1.5 U	< 1.5 U	**2.2**
trans-1,2-Dichloroethene	156-60-5	190,000[5]	< 20 U	< 13 U	< 12 UJ	< 13 U	< 12 UJ	**9.4**	**10**	**6.2**
Trichloroethylene	79-01-6	14,000	**960**	**310**	**710 J**	**130**	**920 J**	**720 D**	**1,000 D**	**750 D**
Vinyl chloride	75-01-4	180,000	< 13 U	< 8.2 U	< 7.8 UJ	< 8.3 U	< 2.7 UJ	**1.7**	< 1.5 U	**1.8**
Xylenes - M,P	1330-20-7	22,000	< 88 U	< 55 U	< 53 UJ	< 57 U	< 51 UJ	< 2.9 U	< 3.0 U	< 3.1 U
Subtotal Project VOCs			**2,340**	**1,135**	**1,914**	**889**	**2,457**	**1,878**	**2,004**	**1,561**
Non-Project VOCs										
2-Butanone	78-93-3	13,000	< 30 U	< 19 U	< 18 UJ	< 19 U	< 17 UJ	**6.4**	**2.0**	**3.7**
2-Hexanone	591-78-6	4,000	< 21 U	< 13 U	< 12 UJ	< 13 U	< 12 UJ	< 1.5 U	< 1.5 U	< 1.5 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	--	--	--	--	--	**820 D**	**680 D**	**350 D**
Acetone	67-64-1	180,000	< 60 U	< 38 U	< 36 UJ	< 39 U	< 130 UJ	**25**	< 15 U	< 15 U
Bromodichloromethane	75-27-4	NS	< 6.8 U	< 4.3 U	< 4.1 UJ	< 4.4 U	< 4.0 UJ	< 1.5 U	< 1.5 U	< 1.5 U
Bromoform	75-25-2	NS	< 52 U	< 33 U	< 31 UJ	< 34 U	< 31 UJ	< 1.5 U	< 1.5 U	< 1.5 U
Carbon Disulfide	75-15-0	6,200	< 16 U	< 10 U	< 9.5 UJ	< 10 U	< 9.1 UJ	< 1.5 U	**1.7**	< 1.5 U
Carbon Tetrachloride	56-23-5	1,900	**8.4**	< 4.0 U	< 3.8 UJ	< 4.1 U	< 3.8 UJ	< 1.5 U	< 1.5 U	< 1.5 U
Chlorodibromomethane	124-48-1	NS	< 8.7 U	< 5.4 U	< 5.2 UJ	< 5.5 U	< 5.1 UJ	< 1.5 U	< 1.5 U	< 1.5 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	--	--	--	--	--	**260 D**	**660 D**	**430 D**
Chloroform	67-66-3	150	< 25 U	**53**	**52 J**	**42**	**30 J**	**18**	**110**	**80**
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	< 50 U	**69**	< 30 UJ	< 32 U	< 29 UJ	**10**	**5.7**	**4.4**
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	< 7.8 U	< 4.9 U	< 4.7 UJ	< 5.0 U	< 4.6 UJ	< 1.5 U	< 1.5 U	< 1.5 U
Methylene Chloride	75-09-2	14,000	< 18 U	< 11 U	< 11 UJ	< 11 U	< 10 UJ	< 1.5 U	< 1.5 U	< 1.5 U
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	< 29 U	< 18 U	< 17 UJ	< 18 U	< 17 UJ	**4.0**	**3.3**	**2.6**
Subtotal Non-Project VOCs			**8.4**	**122**	**52**	**42**	**30**	**1,143**	**1,463**	**871**
TVOC[3]			**2,348**	**1,257**	**1,966**	**931**	**2,487**	**3,021**	**3,467**	**2,432**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)	CAS No.	Sample ID: / Sample Date:	VSP-601 3/12/2010	VSP-601 6/7/2010	VSP-601 8/30/2010	VSP-601 12/3/2010	VSP-600 1/5/2011[6]	VSP-601 3/7/2011	VSP-601 6/8/2011	VSP-601 9/19/2011
Project VOCs	CAS No.	SGC								
1,1,1-Trichloroethane	71-55-6	9,000	**18**	**12**	**22**	< 0.71 U	**17**	**17**	**11**	**17**
1,1-Dichloroethane	75-34-3	NS	**14**	**10**	**17**	< 0.71 U	**16**	**13**	**11**	**14**
1,1-Dichloroethene	75-35-4	380[4]	**5.2**	< 4.2 U	< 7.2 U	< 0.71 U	**5.5**	**4.9**	**5.7**	**4.3**
Benzene	71-43-2	1,300	**57**	**160**	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**570 D**	**770**	**850**	**2.7**	**590 D**	**680**	**620 D**	**580 D**
Tetrachloroethene	127-18-4	300	**15**	**28**	**43**	< 0.71 U	**17**	**15**	**21**	**25**
Toluene	108-88-3	37,000	**1.3**	< 4.2 U	< 7.2 U	**1.4**	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
trans-1,2-Dichloroethene	156-60-5	190,000[5]	**8.0**	**5.0**	**10**	< 0.71 U	**5.5**	< 4.4 U	**4.8**	**6.5**
Trichloroethylene	79-01-6	14,000	**540 D**	**730**	**1,100**	**3.0**	**630 D**	**670**	**590 D**	**680 D**
Vinyl chloride	75-01-4	180,000	**2.1**	< 4.2 U	< 7.2 U	< 0.71 U	**1.7**	< 4.4 U	**1.3**	**1.7**
Xylenes - M,P	1330-20-7	22,000	< 1.5 U	< 8.4 U	< 14 U	< 1.4 U	< 2.9 U	< 8.8 U	< 1.6 U	< 3.2 U
Subtotal Project VOCs			**1,231**	**1,715**	**2,042**	**7.1**	**1,283**	**1,400**	**1,265**	**1,329**
Non-Project VOCs										
2-Butanone	78-93-3	13,000	< 7.3 U	< 42 U	< 72 U	< 7.1 U	< 15 U	< 44 U	< 7.8 U	< 16 U
2-Hexanone	591-78-6	4,000	< 0.73 U	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	**340 D**	**690**	**670**	**1.2**	**170**	**210**	**560 D**	**360 D**
Acetone	67-64-1	180,000	< 7.3 U	< 42 U	< 72 U	< 7.1 U	< 15 U	< 44 U	**14**	< 16 U
Bromodichloromethane	75-27-4	NS	< 0.73 U	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Bromoform	75-25-2	NS	< 0.73 U	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Carbon Disulfide	75-15-0	6,200	< 7.3 U	< 42 U	< 72 U	< 7.1 U	< 15 U	< 44 U	< 7.8 U	< 16 U
Carbon Tetrachloride	56-23-5	1,900	**0.77**	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Chlorodibromomethane	124-48-1	NS	< 0.73 U	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	**300 D**	**120**	**150**	**0.91**	**91**	**95**	**24**	**25**
Chloroform	67-66-3	150	**16**	**14**	**110**	< 0.71 U	**63**	**40**	**23**	**98**
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	**4.3**	< 4.2 U	< 7.2 U	**2.2**	**3.0**	< 4.4 U	**3.2**	**5.3**
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	**0.73**	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Methylene Chloride	75-09-2	14,000	< 0.73 U	< 4.2 U	< 7.2 U	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	**2.7**	< 4.2 U	< 7.2 U	**1.3**	**2.4**	< 4.4 U	**1.7**	**1.9**
Subtotal Non-Project VOCs			**665**	**824**	**930**	**5.6**	**329**	**345**	**626**	**490**
TVOC[3]			**1,895**	**2,539**	**2,972**	**13**	**1,612**	**1,745**	**1,891**	**1,819**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)	CAS No.	Sample ID: / Sample Date:	VSP-601 12/5/2011	VSP-601 3/9/2012	VSP-601 6/4/2012	VSP-601 9/17/2012	VSP-601 12/20/2012	VSP-601 3/28/2013	VSP-601 6/19/2013	VSP-601 9/5/2013
Project VOCs	CAS No.	SGC								
1,1,1-Trichloroethane	71-55-6	9,000	**11**	**7.3**	**8.8**	**14**	**13**	**8.4**	**11**	**14**
1,1-Dichloroethane	75-34-3	NS	**11**	**7.7**	**7.0**	**12**	**13**	**9.4**	**7.9**	**11**
1,1-Dichloroethene	75-35-4	380[4]	**3.3**	< 2.8 U	**1.7**	**2.0**	**2.7**	**3.0**	**2.4**	**2.1**
Benzene	71-43-2	1,300	**2.5**	< 2.8 U	**3.5**	**28**	**12**	**1.5**	**2.6**	**15**
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**540 D**	**460**	**410 D**	**440 D**	**460 D**	**430 D**	**470 D**	**490 D**
Tetrachloroethene	127-18-4	300	**15**	**11**	**20**	**26**	**17**	**1.4**	**17**	**26**
Toluene	108-88-3	37,000	**1.8**	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	< 0.77 U
trans-1,2-Dichloroethene	156-60-5	190,000[5]	**3.8**	< 2.8 U	**3.2**	**5.3**	**4.3**	**2.6**	**2.9**	**4.8**
Trichloroethylene	79-01-6	14,000	**560 D**	**440**	**460 D**	**600 D**	**530 D**	**260 D**	**470 D**	**620 D**
Vinyl chloride	75-01-4	180,000	**1.6**	< 2.8 U	< 0.87 U	< 0.82 U	**0.95**	**1.6**	**0.97**	**0.85**
Xylenes - M,P	1330-20-7	22,000	**1.6**	< 5.6 U	< 1.7 U	< 1.6 U	< 1.7 U	< 1.6 U	< 1.5 U	< 1.5 U
Subtotal Project VOCs			**1,152**	**926**	**914**	**1,127**	**1,053**	**718**	**985**	**1,184**
Non-Project VOCs										
2-Butanone	78-93-3	13,000	< 7.5 U	< 28 U	< 8.7 U	< 8.2 U	< 8.4 U	< 8.0 U	< 7.5 U	< 7.7 U
2-Hexanone	591-78-6	4,000	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	< 0.77 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	**150 D**	**270**	**240 D**	**380 D**	**140**	**160 D**	**230 D**	**380 D**
Acetone	67-64-1	180,000	< 7.5 U	< 28 U	**11**	< 8.2 U	< 8.4 U	< 8.0 U	< 7.5 U	< 7.7 U
Bromodichloromethane	75-27-4	NS	**1.1**	< 2.8 U	**1.2**	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	**1.2**
Bromoform	75-25-2	NS	< 0.75 U	< 2.8 U	**1.3**	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	< 0.77 U
Carbon Disulfide	75-15-0	6,200	< 7.5 U	< 28 U	< 8.7 U	< 8.2 U	< 8.4 U	< 8.0 U	< 7.5 U	< 7.7 U
Carbon Tetrachloride	56-23-5	1,900	< 0.75 U	< 2.8 U	< 0.87 U	**1.1**	< 0.84 U	< 0.80 U	**0.78**	**0.96**
Chlorodibromomethane	124-48-1	NS	< 0.75 U	< 2.8 U	**0.95**	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	< 0.77 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	**17**	**13**	**8.6**	**6.1**	**5.5**	**4.1**	**4.2**	**7.0**
Chloroform	67-66-3	150	**83**	**11**	**13**	**81**	**120**	**18**	**14**	**17**
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	**2.6**	< 2.8 U	**2.2**	**3.8**	**2.9**	**2.4**	**2.5**	**3.3**
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	< 0.77 U
Methylene Chloride	75-09-2	14,000	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U	< 0.80 U	< 0.75 U	< 0.77 U
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	**1.4**	< 2.8 U	**2.3**	**2.3**	**1.6**	**1.5**	**2.1**	**1.8**
Subtotal Non-Project VOCs			**255**	**294**	**281**	**474**	**270**	**186**	**254**	**411**
TVOC[3]			**1,407**	**1,220**	**1,195**	**1,602**	**1,323**	**904**	**1,238**	**1,595**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[2] (units in µg/m^3)		Sample ID: / Sample Date:	VSP-601 12/4/2013	VSP-601 3/11/2014	VSP-601 6/20/2014	VSP-601 9/10/2014	VSP-601 12/10/2014
Project VOCs	CAS No.	SGC					
1,1,1-Trichloroethane	71-55-6	9,000	**13**	**7.6**	**7.3**	**6.3**	**15**
1,1-Dichloroethane	75-34-3	NS	**11**	**6.9**	**6.2**	**5.4**	**14**
1,1-Dichloroethene	75-35-4	380[4]	**1.6**	< 2.0 U	**1.4**	**0.77**	**1.7**
Benzene	71-43-2	1,300	< 0.91 U	**18**	< 0.70 U	**2.7**	**2.7**
cis-1,2-Dichloroethene	156-59-2	190,000[5]	**500 D**	**320**	**410 D**	**190 D**	**519**
Tetrachloroethene	127-18-4	300	**14**	**7.9**	**13**	**14**	**15**
Toluene	108-88-3	37,000	< 0.91 U	< 2.0 U	**0.75**	< 0.77 U	< 0.75 U
trans-1,2-Dichloroethene	156-60-5	190,000[5]	**3.3**	< 2.0 U	**2.5**	**2.5**	**3.8**
Trichloroethylene	79-01-6	14,000	**570 D**	**300**	**390 D**	**320 D**	**570**
Vinyl chloride	75-01-4	180,000	**0.92**	< 2.0 U	**0.99**	< 0.77 U	**1.3**
Xylenes - M,P	1330-20-7	22,000	< 1.8 U	< 3.9 U	< 1.4 U	< 1.5 U	< 0.87 U
Subtotal Project VOCs			**1,114**	**660**	**832**	**542**	**1,143**
Non-Project VOCs							
2-Butanone	78-93-3	13,000	< 9.1 U	< 20 U	< 7.0 U	< 7.7 U	< 0.59 U
2-Hexanone	591-78-6	4,000	< 0.91 U	< 2.0 U	< 0.70 U	**0.86**	< 0.82 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	NS	**170**	**150**	**260 D**	**150**	**120**
Acetone	67-64-1	180,000	< 9.1 U	< 20 U	**7.1**	**15.0**	**1.7**
Bromodichloromethane	75-27-4	NS	< 0.91 U	< 2.0 U	< 0.70 U	< 0.77 U	< 0.67 U
Bromoform	75-25-2	NS	< 0.91 U	< 2.0 U	< 0.70 U	< 0.77 U	< 0.41 U
Carbon Disulfide	75-15-0	6,200	< 9.1 U	< 20 U	< 7.0 U	< 7.7 U	< 0.62 U
Carbon Tetrachloride	56-23-5	1,900	< 0.91 U	< 2.0 U	< 0.70 U	< 0.77 U	0.69
Chlorodibromomethane	124-48-1	NS	< 0.91 U	< 2.0 U	< 0.70 U	< 0.77 U	< 0.85 U
Chlorodifluoromethane (Freon 22)	75-45-6	NS	**3.0**	**2.8**	**1.2**	**1.1**	**3.9**
Chloroform	67-66-3	150	**38**	**8**	**9.8**	**7.7**	**14.0**
Dichlorodifluoromethane (Freon 12)	75-71-8	NS	**2.5**	**2.2**	**2.1**	**2.1**	**3.1**
Trichlorotrifluoroethane (Freon 113)	76-13-1	960,000	< 0.91 U	< 2.0 U	< 0.70 U	< 0.77 U	< 0.77 U
Methylene Chloride	75-09-2	14,000	< 0.91 U	< 2.0 U	< 0.70 U	< 0.77 U	**0.76**
Trichlorofluoromethane (Freon 11)	75-69-4	9,000	**1.3**	< 2.0 U	**1.2**	**1.6**	**1.6**
Subtotal Non-Project VOCs			**215**	**163**	**281**	**178**	**146**
TVOC[3]			**1,329**	**823**	**1,114**	**720**	**1,289**

Notes and abbreviations on last page.

Table 4. Summary of Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.(1)

Notes and Abbreviations:

Bold	Bold data indicates that the analyte was detected at or above its reporting limit.
D	Compound detected at a secondary dilution.
ELAP	Environmental Laboratory Approval Program.
NS	Guideline concentrations not specified in the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014. An interim SGC was not developed for these compounds because they have low toxicity ratings, as specified in the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014.
CAS No.	Chemical Abstracts Service list number.
DAR-1	Division of Air Resources-1 Air Guide-1.
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health.
AGC	Allowable Annual Guideline Concentration.
SGC	Short-term Guideline Concentrations.
TVOC	total volatile organic compounds
USEPA	U.S. Environmental Protection Agency.
VOC	volatile organic compound
µg/m^3	micrograms per cubic meter
<	Compound not detected above its laboratory quantification limit.

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.
2. Table summarizes detected compounds only.
3. TVOC determined by summing individual detections and rounding to the nearest whole number.
4. An SGC was not provided in the DAR-1 AGC/SGC Tables, revised February 28, 2014. An interim SGC was developed based on guidance provided in Section IV.A.2.b.1 of the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. Specifically for 1,1- dichloroethene, which is not defined as a high-toxicity compound, the Interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2. or 1,600 µg/m^3 / 4.2 = approximately 380 µg/m^3. An interim SGC was developed for this compound because it has a moderate toxicity rating, as specified in the DAR-1 AGC/SGC Tables, revised February 28, 2014.
5. An SGC was not provided in the DAR-1 AGC/SGC Tables, revised February 28, 2014. An interim SGC was developed based on guidance provided in Section IV.A.2.b.1 of the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. Specifically for cis-1,2 dichloroethene and trans-1,2 dichloroethene, which are not defined as a high-toxicity compounds, the interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2 or 790,000 µg/m^3 / 4.2 = approximately 190,000 µg/m^3. An interim SGC was developed for these compounds because they have moderate toxicity ratings, as specified in the DAR-1 AGC/SGC Tables, revised February 28, 2014.
6. Analytical results from the total effluent vapor sample collected on December 3, 2010 were not consistent with recent historical trends. Analytical results used in calculations in this table are from the total effluent vapor sample that was recollected on January 5, 2011. System parameter readings used in calculations in this table were collected on December 3, 2010.

Table 5. Summary of Air Emissions Model Output, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound[1]	AGC[2]	Percent of MASC Per Event[3]							
	($\mu g/m^3$)	02/18/08	02/19/08	02/25/08	03/03/08	03/17/08	04/16/08	05/19/08	06/02/08
1,1,1-Trichloroethane	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.63	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.030%	0.042%
1,1-Dichloroethene	200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)[5]	50,000	--	--	--	--	--	--	--	--
2-Butanone	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	30,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromodichloromethane	70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Disulfide	700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Tetrachloride	0.17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodibromomethane	NS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodifluoromethane (Freon 22)[5]	50,000	--	--	--	--	--	--	--	--
Chloroform	14.7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.24%
cis-1,2-Dichloroethene	63	0.0%	0.0%	0.0%	0.0%	0.0%	0.0040%	0.0092%	0.013%
Dichlorodifluoromethane (Freon 12)	12,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	4.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0076%
Toluene	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	63	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0002%
Trichloroethylene	0.2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.034%	0.045%
Trichlorofluoromethane (Freon 11)	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	180,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.068	0.0%	0.0%	0.042%	1.6%	37%	21%	1.9%	0.4%
Xylenes - M,P	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table 5. Summary of Air Emissions Model Output, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound[1]	AGC[2] ($\mu g/m^3$)	Percent of MASC Per Event[3]							
		07/07/08	08/06/08	9/24/2008	10/27/2008	11/25/2008	12/18/2008	3/19/2009[6]	6/26/2009
1,1,1-Trichloroethane	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.63	0.064%	0.047%	0.13%	0.14%	0.14%	0.13%	0.13%	0.082%
1,1-Dichloroethene	200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)[5]	50,000	--	--	--	--	--	--	--	0.0%
2-Butanone	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	30,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.31%	2.8%
Bromodichloromethane	70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Disulfide	700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Tetrachloride	0.17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodibromomethane	NS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodifluoromethane (Freon 22)[5]	50,000	--	--	--	--	--	--	--	0.0%
Chloroform	14.7	0.72%	0.62%	2.6%	3.1%	3.3%	2.8%	1.9%	1.3%
cis-1,2-Dichloroethene	63	0.020%	0.016%	0.032%	0.039%	0.033%	0.033%	0.060%	0.046%
Dichlorodifluoromethane (Freon 12)	12,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	4.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.065%	0.066%
Toluene	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	63	0.0%	0.0002%	0.0004%	0.0%	0.0%	0.0%	0.0%	0.0005%
Trichloroethylene	0.2	0.056%	0.060%	0.78%	0.71%	1.7%	0.73%	5.0%	4.4%
Trichlorofluoromethane (Freon 11)	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	180,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.068	0.20%	0.14%	0.14%	0.0%	0.0%	0.0%	0.0%	0.047%
Xylenes - M,P	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table 5. Summary of Air Emissions Model Output, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound[1]	AGC[2]	Percent of MASC Per Event[3]							
	($\mu g/m^3$)	9/29/2009	12/2/2009	3/12/2010	6/7/2010	8/30/2010	1/5/2011[7]	3/7/2011	6/8/2011
1,1,1-Trichloroethane	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.63	0.093%	0.080%	0.068%	0.053%	0.084%	0.078%	0.072%	0.054%
1,1-Dichloroethene	200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Butanone	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	30	0.0%	0.0%	0.0%	0.0003%	0.0%	0.0%	0.0%	0.0%
Acetone	30,000	0.0%	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzene	0.13	0.33%	3.4%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromodichloromethane	70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Disulfide	700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Tetrachloride	0.17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodibromomethane	NS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodifluoromethane (Freon 22)	50,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chloroform	14.7	7.9%	5.9%	1.1%	1.1%	8.0%	4.5%	3.2%	1.6%
cis-1,2-Dichloroethene	63	0.044%	0.030%	0.028%	0.041%	0.042%	0.029%	0.037%	0.030%
Dichlorodifluoromethane (Freon 12)	12,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	4.0	0.096%	0.060%	0.046%	0.093%	0.13%	0.052%	0.052%	0.065%
Toluene	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	63	0.0005%	0.0003%	0.0004%	0.0003%	0.0005%	0.0003%	0.0%	0.0002%
Trichloroethylene	0.2	6.2%	4.7%	3.3%	4.9%	6.8%	3.9%	4.6%	3.6%
Trichlorofluoromethane (Freon 11)	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	180,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.068	0.0%	0.052%	0.059%	0.0%	0.0%	0.047%	0.0%	0.036%
Xylenes - M,P	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table 5. Summary of Air Emissions Model Output, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound[1]	AGC[2]	Percent of MASC Per Event[3]							
	(µg/m^3)	9/19/2011	12/5/2011	3/9/2012	6/4/2012	9/17/2012	12/20/2012	3/28/2013	6/19/2013
1,1,1-Trichloroethane	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.63	0.067%	0.051%	0.034%	0.032%	0.050%	0.055%	0.040%	0.036%
1,1-Dichloroethene	200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Butanone	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	30,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.13	0.0%	0.057%	0.0%	0.078%	0.56%	0.25%	0.031%	0.058%
Bromodichloromethane	70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.91	0.0%	0.0%	0.0%	0.0041%	0.0%	0.0%	0.0%	0.0%
Carbon Disulfide	700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Tetrachloride	0.17	0.0%	0.0%	0.0%	0.0%	0.043%	0.0%	0.0%	0.013%
Chlorodibromomethane	NS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	--	--
Chlorodifluoromethane (Freon 22)	50,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chloroform	14.7	6.904%	5.683%	0.7101%	0.8742%	4.897%	7.495%	0.0033%	0.0028%
cis-1,2-Dichloroethene	63	0.028%	0.025%	0.020%	0.019%	0.018%	0.020%	0.018%	0.022%
Dichlorodifluoromethane (Freon 12)	12,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	4.0	0.076%	0.044%	0.031%	0.058%	0.068%	0.046%	0.0009%	0.012%
Toluene	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	63	0.0003%	0.0002%	0.0%	0.0%	0.0002%	0.0002%	0.0%	0.0%
Trichloroethylene	0.2	4.1%	3.3%	2.4%	2.7%	3.1%	2.8%	3.5%	6.8%
Trichlorofluoromethane (Freon 11)	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	180,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.068	0.047%	0.043%	0.0%	0.0%	0.0%	0.023%	0.064%	0.041%
Xylenes - M,P	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table 5. Summary of Air Emissions Model Output, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound[1]	AGC[2]	Percent of MASC Per Event[3]						Cumulative % MASC[4]
	($\mu g/m^3$)	9/5/2013	12/4/2013	3/11/2014	6/20/2014	9/10/2014	12/10/2014	
1,1,1-Trichloroethane	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.63	0.054%	0.052%	0.032%	0.034%	0.029%	0.071%	0.041%
1,1-Dichloroethene	200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Butanone	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	30,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.13	0.36%	0.0%	0.40%	0.0%	0.070%	0.066%	0.14%
Bromodichloromethane	70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.91	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Disulfide	700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon Tetrachloride	0.17	0.017%	0.0%	0.0%	0.0%	0.0%	0.013%	0.0030%
Chlorodibromomethane	NS	--	--	--	--	--	--	--
Chlorodifluoromethane (Freon 22)	50,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chloroform	14.7	0.0036%	0.0077%	0.0016%	0.0023%	0.0018%	0.0030%	0.0022%
cis-1,2-Dichloroethene	63	0.024%	0.024%	0.015%	0.023%	0.010%	0.026%	0.019%
Dichlorodifluoromethane (Freon 12)	12,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	4.0	0.020%	0.010%	0.0057%	0.011%	0.012%	0.012%	0.0%
Toluene	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	63	0.0002%	0.0002%	0.0%	0.0%	0.0%	0.0002%	0.0%
Trichloroethylene	0.2	9.6%	8.5%	4.3%	6.8%	5.4%	9.1%	6.4%
Trichlorofluoromethane (Freon 11)	5,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	180,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.068	0.039%	0.040%	0.0%	0.051%	0.0%	0.061%	0.029%
Xylenes - M,P	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table 5. Summary of Air Emissions Model Output, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Notes and Abbreviations:

AGC	Allowable Annual Guideline Concentration
DAR-1	Division of Air Resources Air Guide-1
MASC	Maximum Allowable Stack Concentration
µg/m^3	micrograms per cubic meter
NS	Guideline concentrations not specified in the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014.
NYSDEC	New York State Department of Environmental Conservation
SGC	Short-term Guideline Concentration
USEPA	U.S. Environmental Protection Agency
VPGAC	Vapor phase granular activated carbon
%	percent

1. Table summarizes detected compounds only.
2. AGC refers to the compound-specific AGC per the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014. NYSDEC DAR-1 AGCs were scaled using the results of a site-specific USEPA SCREEN 3 model to calculate the annual MASC per monitoring event.
3. Percent of MASC per event was calculated by dividing the actual effluent concentration by the site-specific annual MASC. Detailed calculations are included in Appendix B.
4. Cumulative percent of the MASC was calculated using a time-weighted average of the percent MASC per event. Values shown have been rounded to include two significant figures.
5. Freon 22 and Freon 142b were reported as tentatively identified compounds through the March 2009 sampling event. Beginning with the April through June 2009 operational period, Freon 22 and Freon 142b have been incorporated into the site analyte list.
6. The VPGAC was removed with NYSDEC approval on December 29, 2008. The March 19, 2009 sample data represents the first effluent sample analyzed without the VPGAC.
7. Analytical results from the total effluent vapor sample collected on December 3, 2010 indicated a sample collection or laboratory error; therefore, the December 3, 2010 total effluent vapor sample results were qualified as unusable. Accordingly, the total effluent vapor sample was recollected on January 5, 2011.

Table 6. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1][2]

Compound[3] (units in µg/L)	Sample ID: Sample Date:	KO-200 3/17/2008	KO-300 3/17/2008	WSP-510 3/17/2008	ST-510 4/21/2009	SG001-6W 4/21/2009	ST-510 9/29/2009
Project VOCs	CAS No.						
1,1,1-Trichloroethane	71-55-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
1,1-Dichloroethane	75-34-3	**1.4**	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
1,1-Dichloroethene	75-35-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
1,2-Dichloroethane	107-06-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Benzene	71-43-2	< 1.0	< 1.0	< 2.5	**4.8**	< 1.0	< 5.0
cis-1,2-Dichloroethene	156-59-2	**40**	**4.0**	**15**	< 1.0	**14**	< 5.0
Tetrachloroethene	127-18-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Toluene	108-88-3	**2.2**	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
trans-1,2-Dichloroethene	156-60-5	**1.1**	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Trichloroethylene	79-01-6	**22**	**3.0**	**9.0**	< 1.0	**3.0**	< 5.0
Vinyl chloride	75-01-4	**4.8**	**1.7**	< 2.5	< 1.0	< 1.0	< 5.0
Xylene-o	95-47-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Xylenes-m,p	1330-20-7	< 1.0	< 1.0	< 2.5	< 2.0	< 2.0	< 5.0
Subtotal Project VOCs		**72**	**8.7**	**24**	**4.8**	17	0.0
Non-Project VOCs							
1,1,2,2-Tetrachloroethane	79-34-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
1,1,2-Trichloroethane	79-00-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
2-Butanone	78-93-3	**1,000**	**1,300**	**440**	**430**	< 5.0	< 10
Acetone	67-64-1	**17**	**40**	**44**	**42**	< 5.0	< 20
Bromoform	75-25-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Bromomethane	74-83-9	< 2.0	< 2.0	< 5.0	< 1.0	< 1.0	< 5.0
Carbon Disulfide	75-15-0	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 10
Carbon Tetrachloride	56-23-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Chlorobenzene	108-90-7	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Dibromochloromethane	124-48-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Chloroethane	75-00-3	< 2.0	< 2.0	< 5.0	**1.5**	< 1.0	< 5.0
Chloroform	67-66-3	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Chloromethane	74-87-3	< 2.0	< 2.0	< 5.0	**1.9**	< 1.0	< 5.0
cis-1,3-Dichloropropene	10061-01-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Dichlorodifluoromethane (Freon 12)	75-71-8	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Ethylbenzene	100-41-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Methylene Chloride	75-09-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Styrene	100-42-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
trans-1,3-Dichloropropene	10061-02-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0	< 5.0
Subtotal Non-Project VOCs		**1,017**	**1,340**	**491**	**482**	0.0	0.0
TVOC[4]		**1,089**	**1,349**	**515**	**487**	**17**	0.0

Notes and abbreviations on last page.

Table 6. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound[3] (units in µg/L)	Sample ID: / Sample Date:	SVE Condensate 3/29/2011	ST-510 3/31/2011	CON-1 3/8/2012	ST-510 3/9/2012	ST-510 3/27/2013
Project VOCs	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	75-34-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	75-35-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	107-06-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	71-43-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	156-59-2	< 5.0	**6.0**	< 5.0	< 5.0	< 5.0
Tetrachloroethene	127-18-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	108-88-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	156-60-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethylene	79-01-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl chloride	75-01-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Xylene-o	95-47-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Xylenes-m,p	1330-20-7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Project VOCs		0.0	**6.0**	0.0	0.0	0.0
Non-Project VOCs						
1,1,2,2-Tetrachloroethane	79-34-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	79-00-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Butanone	78-93-3	< 10	< 10	< 10	< 10	< 10
Acetone	67-64-1	< 20	< 20	< 10	< 10	< 10
Bromoform	75-25-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	74-83-9	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon Disulfide	75-15-0	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	56-23-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	108-90-7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	124-48-1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	75-00-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	67-66-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloromethane	74-87-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	10061-01-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dichlorodifluoromethane (Freon 12)	75-71-8	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	100-41-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methylene Chloride	75-09-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	100-42-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	10061-02-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs		0.0	0.0	0.0	0.0	0.0
TVOC[4]		0.0	**6.0**	0.0	0.0	0.0

Notes and abbreviations on last page.

Table 6. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[(1)]

Notes and Abbreviations:

Bold	Bold data indicates that the analyte was detected at or above its reporting limit.
CAS No.	Chemical abstracts service list number.
µg/L	Micrograms per liter.
ND	No compounds detected.
NA	Not analyzed.
NA	Not applicable.
TVOC	Total volatile organic compounds.
VOC	Volatile organic compound.

1. Water samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analysis per Method 8260.
2. Water samples were collected to characterize condensate generated during the operation of the system prior to discharge. Quarters when a sample was not collected are not included in this summary.
3. Table summarizes Project VOCs and detected Non-Project VOCs only.
4. TVOC determined by summing individual detections and rounding to the nearest whole number.

Table 7. Remedy Performance, Effectiveness and Protectiveness Summary for the Five Year Review Period, Operable Unit 3 Bethpage Park Soil Gas Containment System, Northrop Grumman Systems Corporation, Bethpage, New York.

Goals of the BPGWCS	Goal Achieved during Reporting Period?	Rationale
RAO's[(1)]		
Mitigate the off-site migration of Project VOCs in the on-site soil gas through the implementation of a soil gas containment system installed along the Plant 24 Access Road and McKay Field Access Road, south and west of the Park, respectively	Yes	- The BPSGCS operated as designed and removed 274 pounds of VOCs. Supporting information is provided in Sections 5 and 6.
Comply with applicable NYSDEC SCGs.	Yes	- The measured concentration of individual VOCs in the OU3 BPSGCS effluent air was below SGCs (Table 3). - The measured concentration of individual VOCs in the OU3 BPSGCS effluent air was below applicable instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model (Table 4 and Appendix B) and the time-weighted rolling average for all detected compounds is below the MASCs.
Compliance Objectives		
To mitigate the off-site migration of soil gas, the system was designed to maintain a -0.1 inch of water column (iwc) within a negative pressure curtain established along the Plant 24 Access Road and McKay Field Access Road based on a 12-month rolling average.	Yes	- The BPSGCS maintained a vacuum of -0.1 iwc or greater within the majority of induced vacuum monitoring points based on a 12-month rolling average (through December 2014, Table 3), with several exceptions as described in Section 3.2.
To collect and treat vapors until it is demonstrated that all VOCs in the influent (untreated) vapor stream are present at concentrations lower than the NYSDEC DAR-1 AGCs on a 12-month rolling average and SGCs for any given grab sample. The VPGAC was removed on December 29,2 008 with NYSDEC approval.	Yes	- The measured concentration of individual VOCs in the OU3 BPSGCS effluent air was below SGCs (Table 3). - The measured concentration of individual VOCs in the OU3 BPSGCS effluent air was below applicable instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model (Table 4 and Appendix B) and the time-weighted rolling average for all detected compounds is below the MASCs.
To collet and transfer condensate water to the NCDPW sanity sewer, in accordance with the requirements set forth by NCDPW or dispose off-site at a NYSDEC-permitted disposal facility.	Yes	- Condensate has not been generated in quantities large enough for disposal since March 2013. Condensate generated during the review period was disposed of in accordance with the requirements set forth by the NCDPW (Table 5 and Appendix C).

Notes and Abbreviations

(1) Remedial action objectives set forth in the July 2005 OU3 Order on Consent.

AGC - Annual guideline concentration
BPSGCS - Bethpage Park Soil Gas Containment System
MASC - Maximum allowable stack concentration
NYSDEC - New York State Department of Environmental Conservation
RAO - Remedial action objective
SCG - Standards, criteria and guidelines
SGC - Short-term guideline concentration
USEPA - United States Environmental Protection Agency
VOC - Volatile organic compound

ARCADIS

Figures

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

0 2000' 4000'

SCALE IN FEET

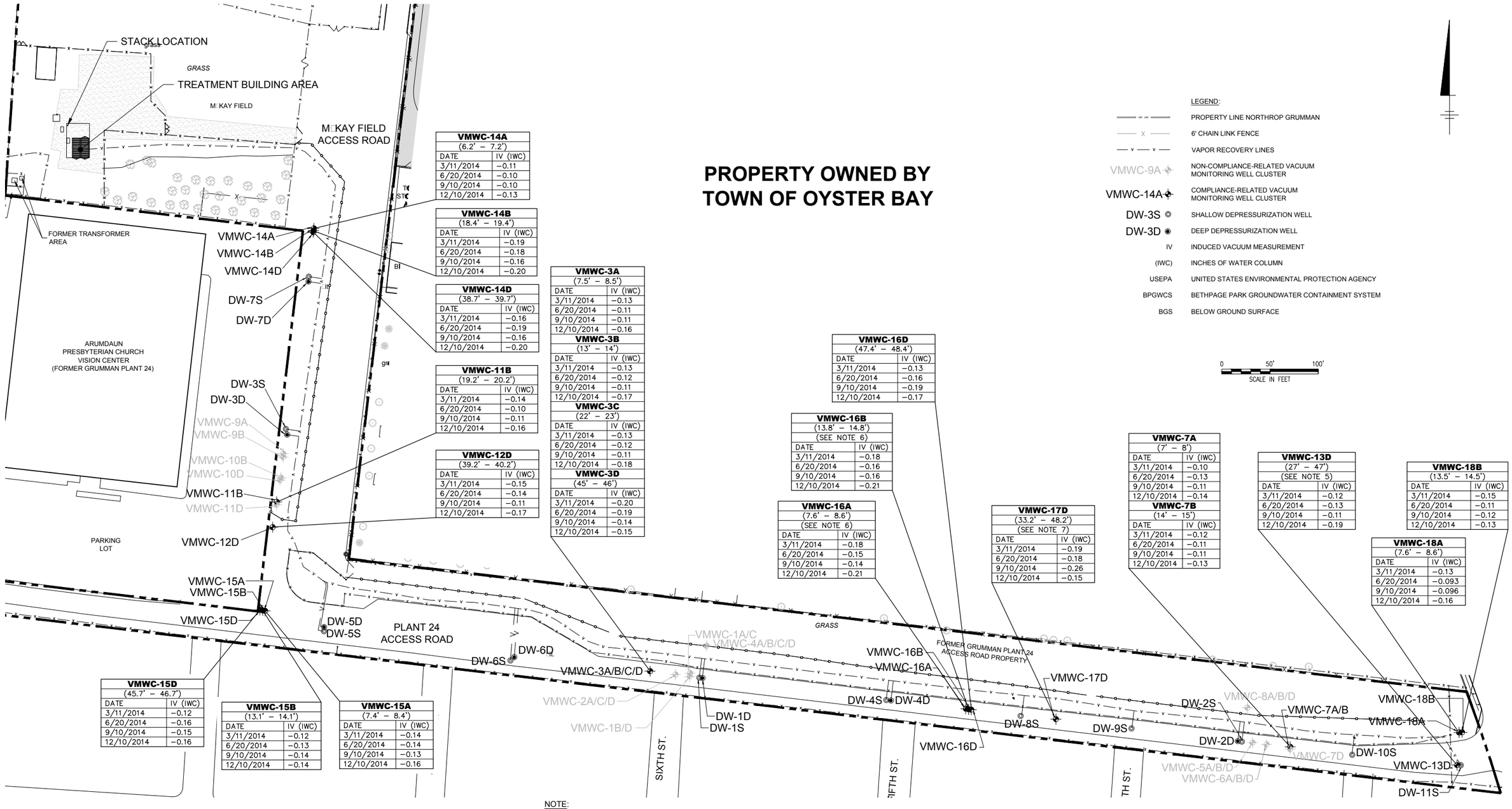
NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS

SITE LOCATION MAP
BETHPAGE PARK SOIL GAS CONTAINMENT SYSTEM

ARCADIS

FIGURE
1

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD: PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
I:\ENVCAD\WhitePlains-NY\ACTIVITY\01496\1212\SGS\4INY1496 F01.dwg LAYOUT: BETHPAGE PARK SAVED: 5/7/2014 12:09 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: --- PLOTTED: 2/19/2015 3:28 PM BY: IAMICELI, KIMBERLY
XREFS: IMAGES: PROJECTNAME: ---
AMITYVILLE.TIF
FREEPORT.TIF
HICKSVILLE.TIF
HUNTINGTON.TIF



VMWC-14A (6.2' – 7.2')

DATE	IV (IWC)
3/11/2014	−0.11
6/20/2014	−0.10
9/10/2014	−0.10
12/10/2014	−0.13

VMWC-14B (18.4' – 19.4')

DATE	IV (IWC)
3/11/2014	−0.19
6/20/2014	−0.18
9/10/2014	−0.16
12/10/2014	−0.20

VMWC-14D (38.7' – 39.7')

DATE	IV (IWC)
3/11/2014	−0.16
6/20/2014	−0.19
9/10/2014	−0.16
12/10/2014	−0.20

VMWC-11B (19.2' – 20.2')

DATE	IV (IWC)
3/11/2014	−0.14
6/20/2014	−0.10
9/10/2014	−0.11
12/10/2014	−0.16

VMWC-12D (39.2' – 40.2')

DATE	IV (IWC)
3/11/2014	−0.15
6/20/2014	−0.14
9/10/2014	−0.11
12/10/2014	−0.17

VMWC-3A (7.5' – 8.5')

DATE	IV (IWC)
3/11/2014	−0.13
6/20/2014	−0.11
9/10/2014	−0.11
12/10/2014	−0.16

VMWC-3B (13' – 14')

DATE	IV (IWC)
3/11/2014	−0.13
6/20/2014	−0.12
9/10/2014	−0.11
12/10/2014	−0.17

VMWC-3C (22' – 23')

DATE	IV (IWC)
3/11/2014	−0.13
6/20/2014	−0.12
9/10/2014	−0.11
12/10/2014	−0.18

VMWC-3D (45' – 46')

DATE	IV (IWC)
3/11/2014	−0.20
6/20/2014	−0.19
9/10/2014	−0.14
12/10/2014	−0.15

VMWC-15D (45.7' – 46.7')

DATE	IV (IWC)
3/11/2014	−0.12
6/20/2014	−0.16
9/10/2014	−0.15
12/10/2014	−0.16

VMWC-15B (13.1' – 14.1')

DATE	IV (IWC)
3/11/2014	−0.12
6/20/2014	−0.13
9/10/2014	−0.14
12/10/2014	−0.14

VMWC-15A (7.4' – 8.4')

DATE	IV (IWC)
3/11/2014	−0.14
6/20/2014	−0.14
9/10/2014	−0.13
12/10/2014	−0.16

VMWC-16D (47.4' – 48.4')

DATE	IV (IWC)
3/11/2014	−0.13
6/20/2014	−0.16
9/10/2014	−0.19
12/10/2014	−0.17

VMWC-16B (13.8' – 14.8') (SEE NOTE 6)

DATE	IV (IWC)
3/11/2014	−0.18
6/20/2014	−0.16
9/10/2014	−0.16
12/10/2014	−0.21

VMWC-16A (7.6' – 8.6') (SEE NOTE 6)

DATE	IV (IWC)
3/11/2014	−0.18
6/20/2014	−0.15
9/10/2014	−0.14
12/10/2014	−0.21

VMWC-17D (33.2' – 48.2') (SEE NOTE 7)

DATE	IV (IWC)
3/11/2014	−0.19
6/20/2014	−0.18
9/10/2014	−0.26
12/10/2014	−0.15

VMWC-7A (7' – 8')

DATE	IV (IWC)
3/11/2014	−0.10
6/20/2014	−0.13
9/10/2014	−0.11
12/10/2014	−0.14

VMWC-7B (14' – 15')

DATE	IV (IWC)
3/11/2014	−0.12
6/20/2014	−0.11
9/10/2014	−0.11
12/10/2014	−0.13

VMWC-13D (27' – 47') (SEE NOTE 5)

DATE	IV (IWC)
3/11/2014	−0.12
6/20/2014	−0.13
9/10/2014	−0.11
12/10/2014	−0.19

VMWC-18B (13.5' – 14.5')

DATE	IV (IWC)
3/11/2014	−0.15
6/20/2014	−0.11
9/10/2014	−0.12
12/10/2014	−0.13

VMWC-18A (7.6' – 8.6')

DATE	IV (IWC)
3/11/2014	−0.13
6/20/2014	−0.093
9/10/2014	−0.096
12/10/2014	−0.16

PROPERTY OWNED BY TOWN OF OYSTER BAY

LEGEND:

- PROPERTY LINE NORTHROP GRUMMAN
- 6' CHAIN LINK FENCE
- VAPOR RECOVERY LINES
- VMWC-9A — NON-COMPLIANCE-RELATED VACUUM MONITORING WELL CLUSTER
- VMWC-14A — COMPLIANCE-RELATED VACUUM MONITORING WELL CLUSTER
- DW-3S — SHALLOW DEPRESSURIZATION WELL
- DW-3D — DEEP DEPRESSURIZATION WELL
- IV — INDUCED VACUUM MEASUREMENT
- (IWC) — INCHES OF WATER COLUMN
- USEPA — UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
- BPGWCS — BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
- BGS — BELOW GROUND SURFACE

0 50' 100'
SCALE IN FEET

NOTE:

1. USEPA'S RADON GUIDANCE RECOMMENDS NEGATIVE PRESSURE OF 0.035 INCHES OF WATER FOR THE CONTROL OF SOIL VAPOR (EPA 625/R-93-011, 1993).
2. SYSTEM DESIGN OBJECTIVE IS TO MAINTAIN -0.1 IWC OF INDUCED VACUUM AT ALL COMPLIANCE-RELATED VACUUM MONITORING WELLS ON A 12-MOUNTH ROLLING AVERAGE (ARCADIS 2007).
3. DATA SHOWN HEREIN ARE COLLECTED FROM COMPLIANCE-RELATED VACUUM MONITORING WELLS ONLY.
4. SCREEN INTERVALS FOR COMPLIANCE-RELATED VACUUM MONITORING WELL CLUSTERS ARE SHOWN IN PARENTHESIS AND ARE MEASURED FROM GROUND SURFACE.
5. STATIC WATER LEVEL IN AREA RANGES FROM 51' - 54' BGS; WATER LEVEL WITH OU3 BPGWCS ONLINE RANGES FROM 51' - 62' BGS.
6. VALUE WAS REMEASURED ON MARCH 21, 2014 DUE TO WELL INACCESSIBILITY ON MARCH 11, 2014.
7. VALUE WAS REMEASURED ON MARCH 21, 2014 DUE TO AN ERRONEOUS VALUE ON MARCH 21, 2014.

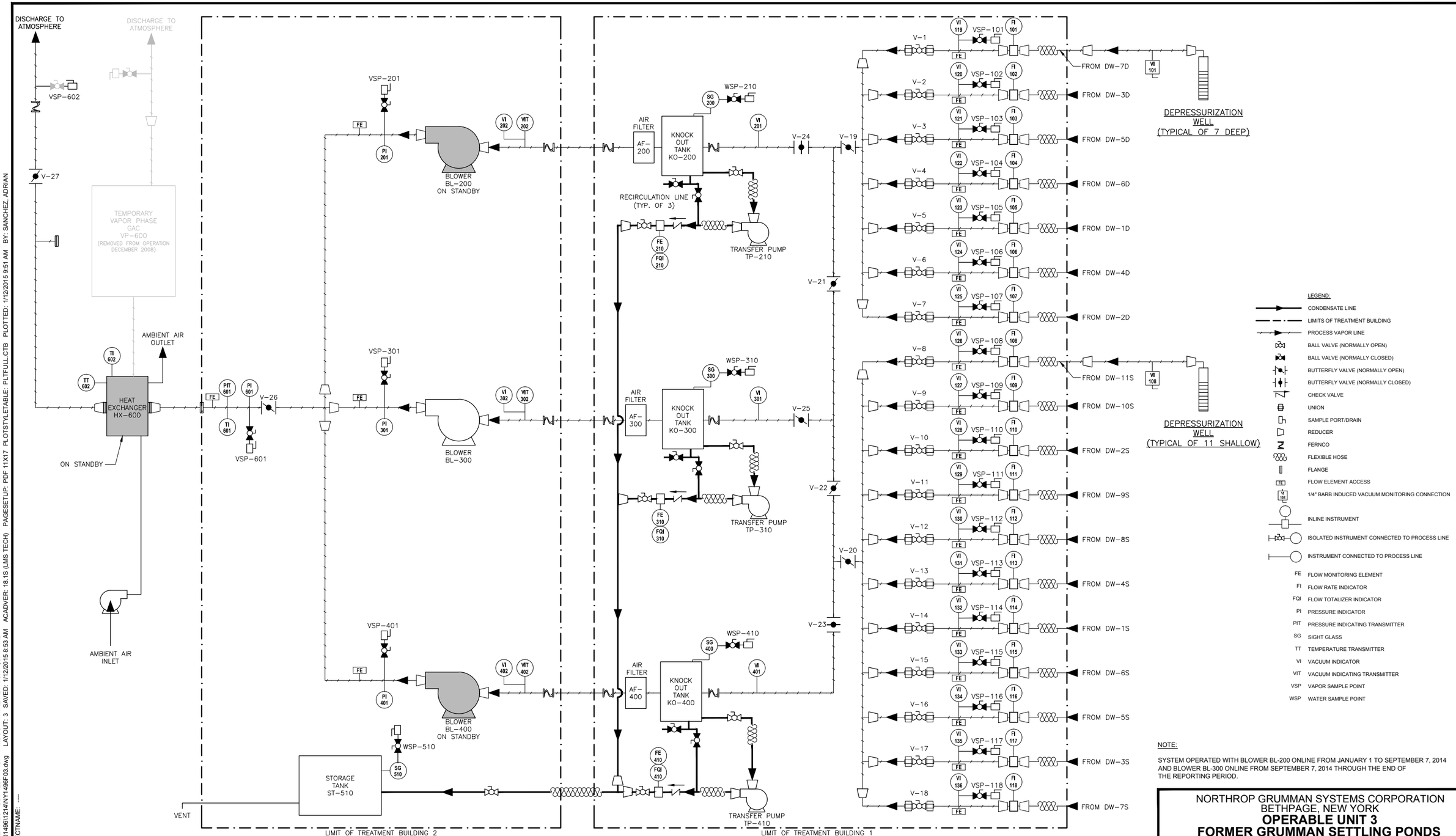
NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS

GENERAL SITE PLAN AND MONITORING WELL VACUUM MEASUREMENTS BETHPAGE PARK SOIL GAS CONTAINMENT SYSTEM

ARCADIS

FIGURE 2

CITY:MELVILLE:NY DIV/GROUP:ENV ad DB:ALS LD: PIC: PM:CSG TM: LYR:ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIVITY\00149611214\NY1496F02-4qRe..dwg LAYOUT:2 SAVED: 3/10/2015 10:38 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: PDF 11X17 PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/10/2015 12:41 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: NY001464.0909.00001
Xr-1496X01



NOTE:

SYSTEM OPERATED WITH BLOWER BL-200 ONLINE FROM JANUARY 1 TO SEPTEMBER 7, 2014 AND BLOWER BL-300 ONLINE FROM SEPTEMBER 7, 2014 THROUGH THE END OF THE REPORTING PERIOD.

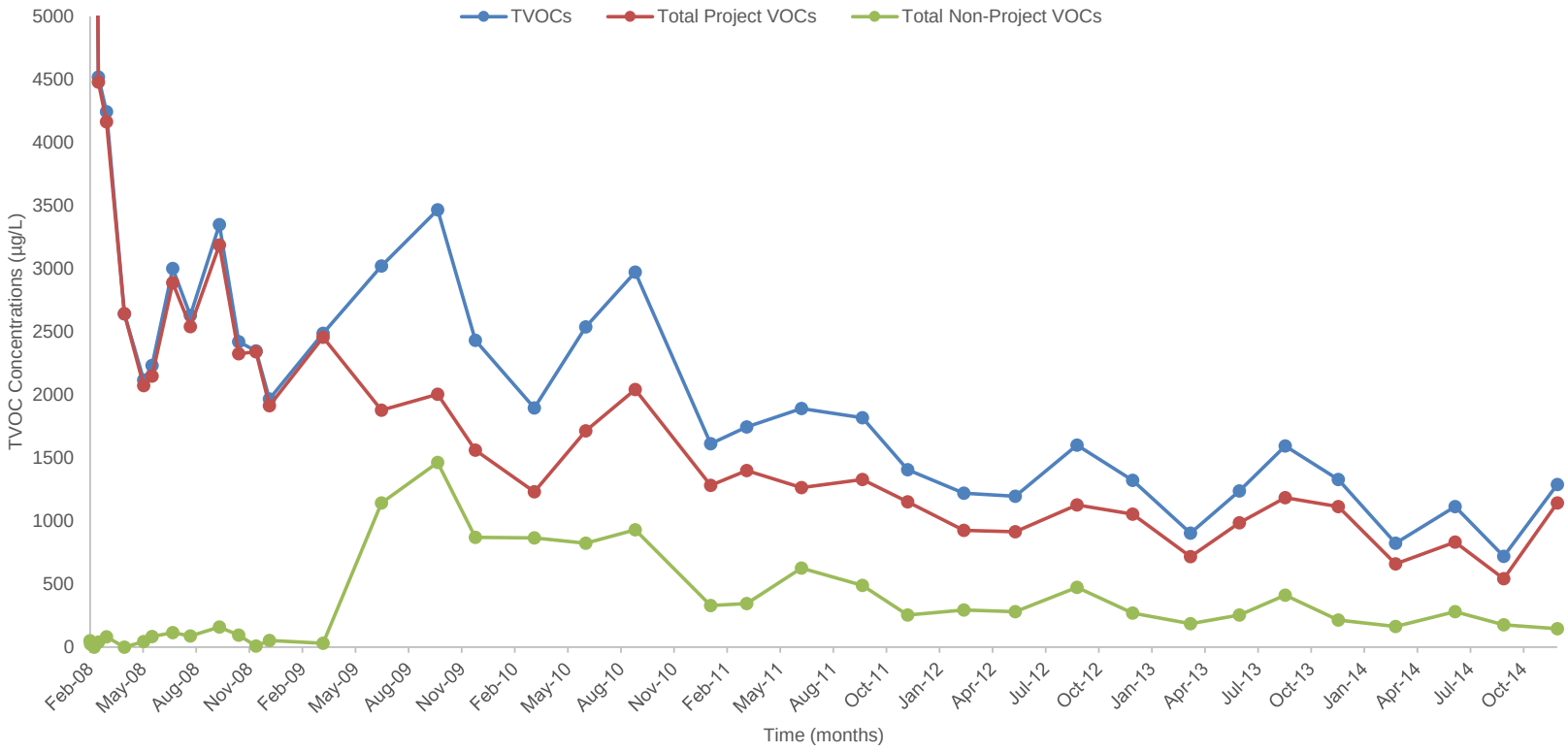
NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS

PROCESS FLOW DIAGRAM BETHPAGE PARK SOIL GAS CONTAINMENT SYSTEM

ARCADIS

FIGURE
3

CITY:MELVILLE:NY DIV/GROUP:ENV DB: LD: PIC: PM:CSG TM:KZ LYR:ON=*;OFF=*REF* ACADVER: 18.1S (LMS TECH) PAGESETUP: PDF 11X17 PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/12/2015 9:51 AM BY: SANCHEZ, ADRIAN
G:\ENVCAD\SYRACUSE\ACT\NY0014961\214\NY1486F03.dwg LAYOUT: 3 SAVED: 1/12/2015 8:53 AM
XREFS: IMAGES: PROJECTNAME: ----



Notes:

µg/L = micrograms per liter.

TVOCs = Sum of VOCs detected.

VOC = Volatile organic compound.

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.

1. Results prior to March 3, 2008 are not shown to improve figure clarity. The TVOC concentrations and sample dates are as follows: February 18, 2008 - 20,622 µg/L, February 19, 2008 - 14,519 µg/L, and February 25, 2008 - 8,196 µg/L.

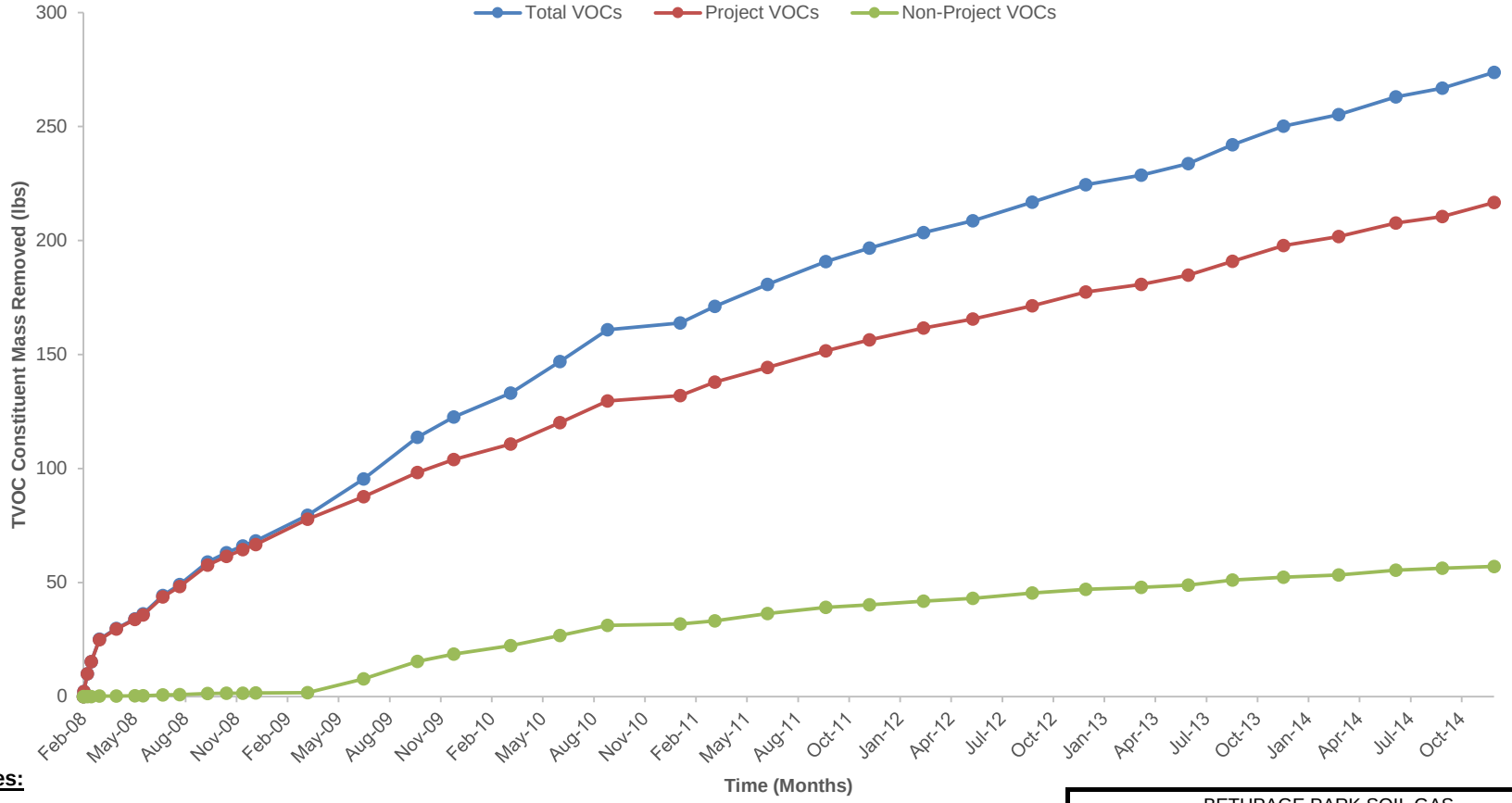
2. The sample results from December 3, 2010 were not consistent with historical data and is not included in this figure. The TVOC concentration for December 3, 2010 was 13 µg/L and is provided in Table 3 and Appendix A.

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

SOIL GAS TVOC CONCENTRATIONS THROUGH DECEMBER 2014

ARCADIS

FIGURE
4



Notes:

µg/L = micrograms per liter.

TVOCs = Sum of VOCs detected.

VOC = Volatile organic compound.

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.

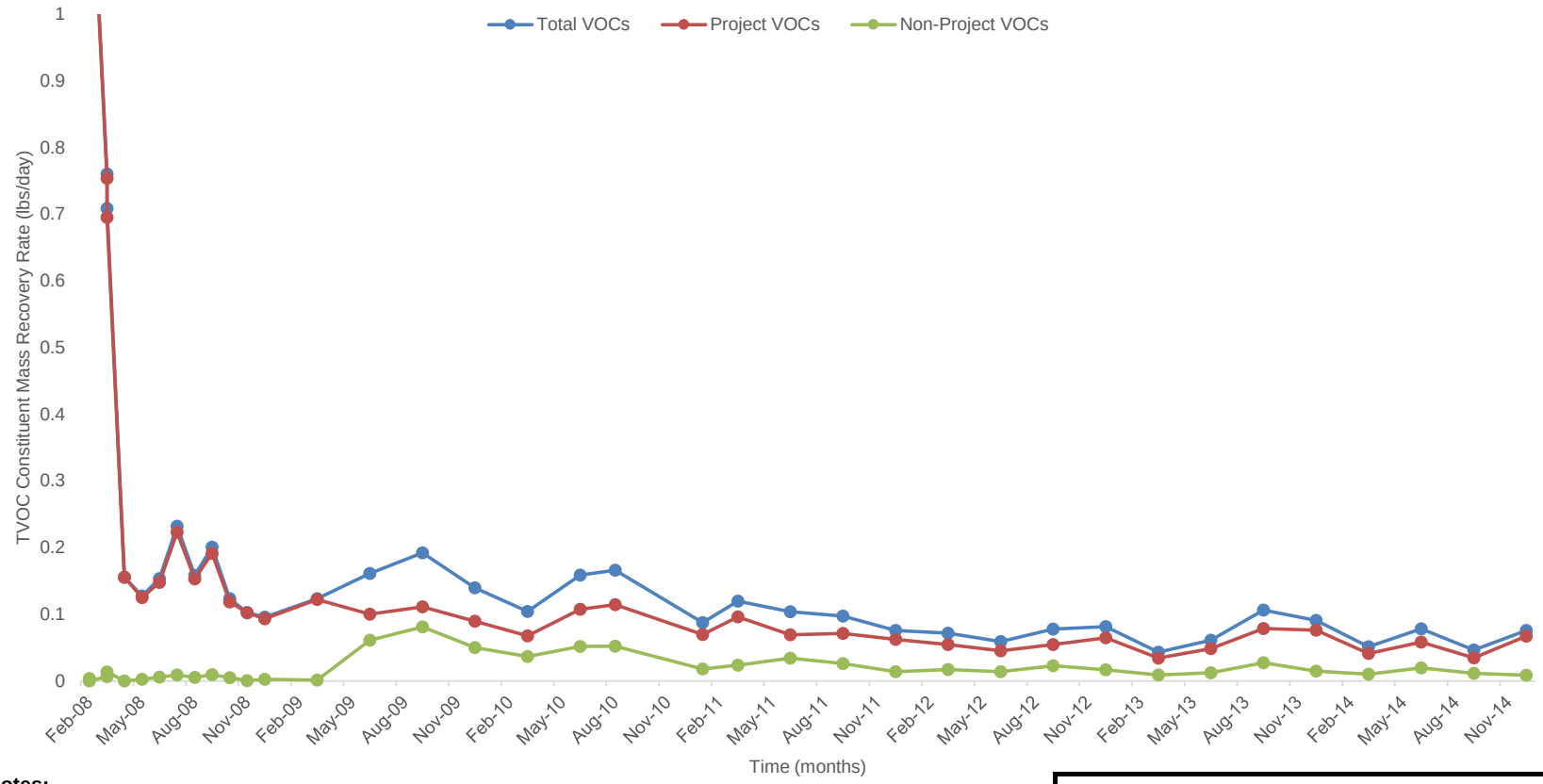
1. The sample results from December 3, 2010 were not consistent with historical data and thus, the recovery rate is not included in this table. The samples results from December 3, 2010 are provided in Table 3 and Appendix A.

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

CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT TVOC MASS REMOVED THROUGH DECEMBER 2014

ARCADIS

FIGURE
5



Notes:

µg/L = micrograms per liter.
TVOCs = Sum of VOCs detected.
VOC = Volatile organic compound.
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.
1. Results prior to March 3, 2008 are not shown to improve figure clarity. The TVOC concentrations and sample dates are as follows: February 19, 2008 - 2.2 lbs/day and February 25, 2008 1.3 lbs/day.
2. The sample results from December 3, 2010 were not consistent with historical data and thus the recovery rate is not included in this figure. The TVOC concentration for December 3, 2010 was 13 µg/L and is provided in Table 3 and Appendix A.

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

TVOC MASS RECOVERY RATES THROUGH DECEMBER 2014

ARCADIS

FIGURE
6

Appendix A

Vapor Sample Analytical Results Including Tentatively Identified Compounds

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 2/18/2008	VSP-602 2/18/2008	VSP-601 2/19/2008	VSP-602 2/19/2008	VSP-601 2/25/2008
	CAS No.					
1,1,1-Trichloroethane	71-55-6	**110**	< 0.62 U	**71**	< 0.61 U	**35**
1,1,2,2-Tetrachloroethane	79-34-5	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
1,1,2-Trichloroethane	79-00-5	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
1,1-Dichloroethane	75-34-3	**43**	< 0.62 U	**33**	< 0.61 U	**45**
1,1-Dichloroethene	75-35-4	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
1,2-Dichloroethane	107-06-2	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
1,2-Dichloropropane	78-87-5	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
1,3-Butadiene	106-99-0	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	--	--	--	--	--
2-Butanone	78-93-3	**16**	< 0.62 U	< 11 U	< 0.61 U	< 25 U
2-Hexanone	591-78-6	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
4-Methyl-2-Pentanone	108-10-1	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Acetone	67-64-1	< 140 U	< 6.2 U	< 110 U	< 6.1 U	< 250 U
Benzene	71-43-2	**67**	< 0.62 U	**22**	< 0.61 U	< 25 U
Bromodichloromethane	75-27-4	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Bromoform	75-25-2	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Bromomethane	74-83-9	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Carbon Disulfide	75-15-0	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Carbon Tetrachloride	56-23-5	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Chlorobenzene	108-90-7	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Chlorodibromomethane	124-48-1	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Chlorodifluoromethane (Freon 22)	75-45-6	--	--	--	--	--
Chloroethane	75-00-3	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Chloroform	67-66-3	**34**	< 0.62 U	**24**	< 0.61 U	< 25 U
Chloromethane	74-87-3	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
cis-1,2-Dichloroethene	156-59-2	**5,800**	< 0.62 U	**4,600**	< 0.61 U	**2,900**
cis-1,3-Dichloropropene	10061-01-5	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Ethylbenzene	100-41-4	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Dichlorodifluoromethane (Freon 12)	75-71-8	< 14 U	< 0.62 U	< 11 U	**0.71**	< 25 U
Methyl Tert-Butyl Ether	1634-04-4	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Methylene Chloride	75-09-2	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Styrene	100-42-5	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Tetrachloroethene	127-18-4	**340**	< 0.62 U	**200**	< 0.61 U	**82**
Toluene	108-88-3	**92**	< 0.62 U	**98**	< 0.61 U	**34**
trans-1,2-Dichloroethene	156-60-5	120	< 0.62 U	71	< 0.61 U	< 25 U
trans-1,3-Dichloropropene	10061-02-6	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Trichloroethylene	79-01-6	**14,000**	< 0.62 U	**9,400**	< 0.61 U	**5,100**
Trichlorofluoromethane (Freon 11)	75-69-4	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Vinyl chloride	75-01-4	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Xylene-o	95-47-6	< 14 U	< 0.62 U	< 11 U	< 0.61 U	< 25 U
Xylenes - m,p	179601-23-1	< 28 U	< 1.2 U	< 21 U	< 1.2 U	< 51 U
TVOC[2]		**20,622**	0	**14,519**	**0.71**	**8,196**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-602 2/25/2008	VSP-601 3/3/2008	VSP-602 3/3/2008	VSP-601 3/17/2008	VSP-602 3/17/2008
	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 0.63 U	**26**	< 0.63 U	**35**	< 14 U
1,1,2,2-Tetrachloroethane	79-34-5	< 0.63 U	< 13 U	< 0.63 U	< 3.6 U	< 3.6 U
1,1,2-Trichloroethane	79-00-5	< 0.63 U	< 13 U	< 0.63 U	< 14 U	< 14 U
1,1-Dichloroethane	75-34-3	< 0.63 U	**47**	< 0.63 U	**59**	< 11 U
1,1-Dichloroethene	75-35-4	< 0.63 U	< 13 U	< 0.63 U	< 10 U	< 10 U
1,2-Dichloroethane	107-06-2	< 0.63 U	< 13 U	< 0.63 U	< 11 U	< 11 U
1,2-Dichloropropane	78-87-5	< 0.63 U	< 13 U	< 0.63 U	< 12 U	< 12 U
1,3-Butadiene	106-99-0	< 0.63 U	< 13 U	< 0.63 U	< 12 U	< 12 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	--	--	--	--	--
2-Butanone	78-93-3	< 0.63 U	< 13 U	< 0.63 U	< 16 U	< 16 U
2-Hexanone	591-78-6	< 0.63 U	< 13 U	< 0.63 U	< 11 U	< 11 U
4-Methyl-2-Pentanone	108-10-1	< 0.63 U	< 13 U	< 0.63 U	< 22 U	< 22 U
Acetone	67-64-1	< 6.3 U	< 130 U	< 6.3 U	< 31 U	< 31 U
Benzene	71-43-2	< 0.63 U	< 13 U	< 0.63 U	< 8.4 U	< 8.4 U
Bromodichloromethane	75-27-4	< 0.63 U	< 13 U	< 0.63 U	< 3.5 U	< 3.5 U
Bromoform	75-25-2	< 0.63 U	< 13 U	< 0.63 U	< 27 U	< 27 U
Bromomethane	74-83-9	< 0.63 U	< 13 U	< 0.63 U	< 10 U	< 10 U
Carbon Disulfide	75-15-0	< 0.63 U	< 13 U	< 0.63 U	< 8.2 U	< 8.2 U
Carbon Tetrachloride	56-23-5	< 0.63 U	< 13 U	< 0.63 U	< 3.3 U	< 3.3 U
Chlorobenzene	108-90-7	< 0.63 U	< 13 U	< 0.63 U	< 12 U	< 12 U
Chlorodibromomethane	124-48-1	< 0.63 U	< 13 U	< 0.63 U	< 4.5 U	< 4.5 U
Chlorodifluoromethane (Freon 22)	75-45-6	--	--	--	--	--
Chloroethane	75-00-3	< 0.63 U	< 13 U	< 0.63 U	< 14 U	< 14 U
Chloroform	67-66-3	< 0.63 U	**27**	< 0.63 U	**35**	< 13 U
Chloromethane	74-87-3	< 0.63 U	< 13 U	< 0.63 U	< 11 U	< 11 U
cis-1,2-Dichloroethene	156-59-2	< 0.63 U	**1,600**	< 0.63 U	**1,400 D**	< 10 U
cis-1,3-Dichloropropene	10061-01-5	< 0.63 U	< 13 U	< 0.63 U	< 24 U	< 24 U
Ethylbenzene	100-41-4	< 0.63 U	< 13 U	< 0.63 U	< 23 U	< 23 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**5.7**	**13**	**8.3**	**46**	< 26 U
Methyl Tert-Butyl Ether	1634-04-4	< 0.63 U	< 13 U	< 0.63 U	< 19 U	< 19 U
Methylene Chloride	75-09-2	< 0.63 U	< 13 U	< 0.63 U	< 9.2 U	< 9.2 U
Styrene	100-42-5	< 0.63 U	< 13 U	< 0.63 U	< 22 U	< 22 U
Tetrachloroethene	127-18-4	< 0.63 U	**45**	< 0.63 U	**39**	< 3.6 U
Toluene	108-88-3	< 0.63 U	**61**	< 0.63 U	**140**	< 10 U
trans-1,2-Dichloroethene	156-60-5	< 0.63 U	< 13 U	< 0.63 U	**10**	< 10 U
trans-1,3-Dichloropropene	10061-02-6	< 0.63 U	< 13 U	< 0.63 U	< 12 U	< 12 U
Trichloroethylene	79-01-6	< 0.63 U	**2,500**	< 0.63 U	**1,500 D**	< 2.8 U
Trichlorofluoromethane (Freon 11)	75-69-4	< 0.63 U	< 13 U	< 0.63 U	< 15 U	< 15 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 0.63 U	< 13 U	< 0.63 U	< 4.0 U	< 4.0 U
Vinyl chloride	75-01-4	**1.1**	**200**	**40**	**980 D**	**920 D**
Xylene-o	95-47-6	< 0.63 U	< 13 U	< 0.63 U	< 23 U	< 23 U
Xylenes - m,p	179601-23-1	< 1.3 U	< 13 U	< 0.63 U	< 46 U	< 46 U
TVOC[2]		**6.8**	**4,519**	**48**	**4,244**	**920**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 4/16/2008	VSP-602 4/16/2008	VSP-601 5/19/2008	VSP-602 5/19/2008	VSP-601 6/2/2008
	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 25 U	< 26 U	**38**	< 2.7 U	**44**
1,1,2,2-Tetrachloroethane	79-34-5	< 6.2 U	< 6.4 U	< 6.6 U	< 0.67 U	< 6.3 U
1,1,2-Trichloroethane	79-00-5	< 25 U	< 26 U	< 26 U	< 2.7 U	< 25 U
1,1-Dichloroethane	75-34-3	**31**	< 19 U	**25**	**5.8**	**27**
1,1-Dichloroethene	75-35-4	< 18 U	< 19 U	< 19 U	< 1.9 U	< 18 U
1,2-Dichloroethane	107-06-2	< 18 U	< 19 U	< 20 U	< 2.0 U	< 19 U
1,2-Dichloropropane	78-87-5	< 21 U	< 22 U	< 22 U	< 2.3 U	< 21 U
1,3-Butadiene	106-99-0	< 20 U	< 21 U	< 21 U	< 2.2 U	< 20 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	--	--	--	--	--
2-Butanone	78-93-3	< 27 U	< 28 U	< 28 U	< 2.9 U	**28**
2-Hexanone	591-78-6	< 19 U	< 19 U	< 20 U	< 2.0 U	< 19 U
4-Methyl-2-Pentanone	108-10-1	< 37 U	< 38 U	< 39 U	< 4.0 U	< 38 U
Acetone	67-64-1	< 54 U	< 56 U	< 57 U	< 5.8 U	< 55 U
Benzene	71-43-2	< 14 U	< 15 U	**19**	< 1.6 U	< 15 U
Bromodichloromethane	75-27-4	< 6.1 U	< 6.3 U	< 6.5 U	< 0.66 U	< 6.2 U
Bromoform	75-25-2	< 47 U	< 48 U	< 50 U	< 5.1 U	< 48 U
Bromomethane	74-83-9	< 18 U	< 18 U	< 19 U	< 1.9 U	< 18 U
Carbon Disulfide	75-15-0	< 14 U	< 15 U	< 15 U	< 1.5 U	< 14 U
Carbon Tetrachloride	56-23-5	< 5.7 U	< 5.9 U	< 6.1 U	< 0.62 U	< 5.8 U
Chlorobenzene	108-90-7	< 21 U	< 22 U	< 22 U	< 2.3 U	< 21 U
Chlorodibromomethane	124-48-1	< 7.7 U	< 8.0 U	< 8.2 U	< 0.84 U	< 7.8 U
Chlorodifluoromethane (Freon 22)	75-45-6	--	--	--	--	--
Chloroethane	75-00-3	< 24 U	< 25 U	< 25 U	< 2.6 U	< 24 U
Chloroform	67-66-3	< 22 U	< 23 U	**44**	< 2.4 U	**55**
Chloromethane	74-87-3	< 19 U	< 19 U	< 20 U	< 2.0 U	< 19 U
cis-1,2-Dichloroethene	156-59-2	**1,100**	**79**	**950**	**180**	**930**
cis-1,3-Dichloropropene	10061-01-5	< 41 U	< 43 U	< 44 U	< 4.5 U	< 42 U
Ethylbenzene	100-41-4	< 39 U	< 41 U	< 42 U	< 4.3 U	< 40 U
Dichlorodifluoromethane (Freon 12)	75-71-8	< 45 U	< 46 U	< 48 U	< 4.9 U	< 45 U
Methyl Tert-Butyl Ether	1634-04-4	< 33 U	< 34 U	< 35 U	< 3.5 U	< 33 U
Methylene Chloride	75-09-2	< 16 U	< 16 U	< 17 U	< 1.7 U	< 16 U
Styrene	100-42-5	< 39 U	< 40 U	< 41 U	< 4.2 U	< 39 U
Tetrachloroethene	127-18-4	**54**	< 6.4 U	**42**	< 0.67 U	**48**
Toluene	108-88-3	**37**	< 18 U	< 18 U	< 1.8 U	< 17 U
trans-1,2-Dichloroethene	156-60-5	< 18 U	< 19 U	< 19 U	< 1.9 U	< 18 U
trans-1,3-Dichloropropene	10061-02-6	< 21 U	< 21 U	< 22 U	< 2.2 U	< 21 U
Trichloroethylene	79-01-6	**1,300**	< 5.0 U	**1,000**	**5.3**	**1,100**
Trichlorofluoromethane (Freon 11)	75-69-4	< 25 U	< 26 U	< 27 U	< 2.8 U	< 26 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 6.9 U	< 7.2 U	< 7.4 U	< 0.75 U	< 7.0 U
Vinyl chloride	75-01-4	**120**	**710**	< 12 U	**65**	< 12 U
Xylene-o	95-47-6	< 39 U	< 41 U	< 42 U	< 4.3 U	< 40 U
Xylenes - m,p	179601-23-1	< 79 U	< 81 U	< 84 U	< 8.5 U	< 80 U
TVOC[2]		**2,642**	**789**	**2,118**	**256**	**2,232**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-602 6/2/2008	VSP-601 7/7/2008	VSP-602 7/7/2008	VSP-601 8/6/2008	VSP-602 8/6/2008
	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 2.5 U	**48**	< 6.5 U	**47**	< 4.4 U
1,1,2,2-Tetrachloroethane	79-34-5	< 0.63 U	< 6.1 U	< 1.6 U	< 7.5 U	< 1.1 U
1,1,2-Trichloroethane	79-00-5	< 2.5 U	< 24 U	< 6.5 U	< 30 U	< 4.4 U
1,1-Dichloroethane	75-34-3	**7.6**	**28**	**11**	**26**	**9.2**
1,1-Dichloroethene	75-35-4	< 1.8 U	< 18 U	< 4.7 U	< 22 U	< 3.2 U
1,2-Dichloroethane	107-06-2	< 1.9 U	< 18 U	< 4.8 U	< 22 U	< 3.3 U
1,2-Dichloropropane	78-87-5	< 2.1 U	< 21 U	< 5.5 U	< 25 U	< 3.7 U
1,3-Butadiene	106-99-0	< 2.0 U	< 20 U	< 5.3 U	< 24 U	< 3.6 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	--	--	--	--	--
2-Butanone	78-93-3	< 2.7 U	**27**	< 7.0 U	< 32 U	< 4.7 U
2-Hexanone	591-78-6	< 1.9 U	< 18 U	< 4.9 U	< 22 U	< 3.3 U
4-Methyl-2-Pentanone	108-10-1	< 3.8 U	< 36 U	< 9.7 U	< 45 U	< 6.6 U
Acetone	67-64-1	**8.4**	< 53 U	< 14 U	< 65 U	< 9.6 U
Benzene	71-43-2	< 1.5 U	**150**	< 3.8 U	**22**	< 2.6 U
Bromodichloromethane	75-27-4	< 0.62 U	< 6.0 U	< 1.6 U	< 7.3 U	< 1.1 U
Bromoform	75-25-2	< 4.8 U	< 46 U	< 12 U	< 56 U	< 8.3 U
Bromomethane	74-83-9	< 1.8 U	< 17 U	< 4.6 U	< 21 U	< 3.1 U
Carbon Disulfide	75-15-0	< 1.4 U	< 14 U	< 3.7 U	< 17 U	< 2.5 U
Carbon Tetrachloride	56-23-5	< 0.58 U	< 5.6 U	< 1.5 U	< 6.8 U	< 1.0 U
Chlorobenzene	108-90-7	< 2.1 U	< 20 U	< 5.5 U	< 25 U	< 3.7 U
Chlorodibromomethane	124-48-1	< 0.78 U	< 7.6 U	< 2.0 U	< 9.3 U	< 1.4 U
Chlorodifluoromethane (Freon 22)	75-45-6	--	--	--	--	--
Chloroethane	75-00-3	< 2.4 U	< 23 U	< 6.3 U	< 29 U	< 4.2 U
Chloroform	67-66-3	**3.0**	**88**	**8.4**	**89**	**8.2**
Chloromethane	74-87-3	< 1.9 U	< 18 U	< 4.9 U	< 22 U	< 3.3 U
cis-1,2-Dichloroethene	156-59-2	**230 D**	**1,100**	**350**	**990**	**320 D**
cis-1,3-Dichloropropene	10061-01-5	< 4.2 U	< 40 U	< 11 U	< 49 U	< 7.3 U
Ethylbenzene	100-41-4	< 4.0 U	< 39 U	< 10 U	< 47 U	< 7.0 U
Dichlorodifluoromethane (Freon 12)	75-71-8	< 4.5 U	< 44 U	< 12 U	< 54 U	< 8.0 U
Methyl Tert-Butyl Ether	1634-04-4	< 3.3 U	< 32 U	< 8.6 U	< 39 U	< 5.8 U
Methylene Chloride	75-09-2	< 1.6 U	< 15 U	< 4.1 U	< 19 U	< 2.8 U
Styrene	100-42-5	< 3.9 U	< 38 U	< 10 U	< 46 U	< 6.9 U
Tetrachloroethene	127-18-4	**2.2**	**61**	< 1.6 U	**56**	< 1.1 U
Toluene	108-88-3	< 1.7 U	< 17 U	< 4.5 U	< 20 U	< 3.0 U
trans-1,2-Dichloroethene	156-60-5	**2.8**	< 18 U	< 4.7 U	< 22 U	**3.6**
trans-1,3-Dichloropropene	10061-02-6	< 2.1 U	< 20 U	< 5.4 U	< 25 U	< 3.7 U
Trichloroethylene	79-01-6	**6.5**	**1,500**	**7.7**	**1,400**	**9.2**
Trichlorofluoromethane (Freon 11)	75-69-4	< 2.6 U	< 25 U	< 6.7 U	< 31 U	**5.5**
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 0.70 U	< 6.8 U	< 1.8 U	< 8.3 U	< 1.2 U
Vinyl chloride	75-01-4	**13**	< 11 U	**5.9**	< 14 U	**4.9**
Xylene-o	95-47-6	< 4.0 U	< 39 U	< 10 U	< 47 U	< 7.0 U
Xylenes - m,p	179601-23-1	< 8.0 U	< 77 U	< 21 U	< 94 U	< 14 U
TVOC[2]		**274**	**3,002**	**383**	**2,630**	**361**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 9/24/2008	VSP-602 9/24/2008	VSP-601 10/27/2008	VSP-602 10/27/2008	VSP-601 11/25/2008
	CAS No.					
1,1,1-Trichloroethane	71-55-6	**77**	**9.7**	**61**	< 15 U	**68**
1,1,2,2-Tetrachloroethane	79-34-5	< 7.3 U	< 0.73 U	< 4.7 U	< 3.7 U	< 7.0 U
1,1,2-Trichloroethane	79-00-5	< 29 U	< 2.9 U	< 19 U	< 15 U	< 28 U
1,1-Dichloroethane	75-34-3	**47**	**26**	**33**	**30**	**38**
1,1-Dichloroethene	75-35-4	< 21 U	**3.5**	< 14 U	< 11 U	< 20 U
1,2-Dichloroethane	107-06-2	< 22 U	< 2.2 U	< 14 U	< 11 U	< 21 U
1,2-Dichloropropane	78-87-5	< 25 U	< 2.5 U	< 16 U	< 12 U	< 23 U
1,3-Butadiene	106-99-0	< 24 U	< 2.4 U	< 15 U	< 12 U	< 22 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	--	--	--	--	--
2-Butanone	78-93-3	< 31 U	< 3.2 U	< 20 U	< 16 U	< 30 U
2-Hexanone	591-78-6	< 22 U	< 2.2 U	< 14 U	< 11 U	< 21 U
4-Methyl-2-Pentanone	108-10-1	< 44 U	< 4.4 U	< 28 U	< 22 U	< 42 U
Acetone	67-64-1	< 63 U	< 6.3 U	< 41 U	< 32 U	< 60 U
Benzene	71-43-2	< 17 U	< 1.7 U	< 11 U	< 8.5 U	**43**
Bromodichloromethane	75-27-4	< 7.1 U	< 0.72 U	< 4.6 U	< 3.6 U	< 6.8 U
Bromoform	75-25-2	< 55 U	< 5.5 U	< 36 U	< 28 U	< 52 U
Bromomethane	74-83-9	< 21 U	< 2.1 U	< 13 U	< 10 U	< 20 U
Carbon Disulfide	75-15-0	< 17 U	< 1.7 U	< 11 U	< 8.3 U	< 16 U
Carbon Tetrachloride	56-23-5	< 6.7 U	< 0.67 U	< 4.3 U	< 3.3 U	**8.4**
Chlorobenzene	108-90-7	< 25 U	< 2.5 U	< 16 U	< 12 U	< 23 U
Chlorodibromomethane	124-48-1	< 9.1 U	< 0.91 U	< 5.9 U	< 4.5 U	< 8.7 U
Chlorodifluoromethane (Freon 22)	75-45-6	--	--	--	--	--
Chloroethane	75-00-3	< 28 U	< 2.8 U	< 18 U	< 14 U	< 27 U
Chloroform	67-66-3	**160**	**35**	**95**	**45**	< 25 U
Chloromethane	74-87-3	< 22 U	< 2.2 U	< 14 U	< 11 U	< 21 U
cis-1,2-Dichloroethene	156-59-2	**1,500**	**620 D**	**1,100**	**830**	**1,200**
cis-1,3-Dichloropropene	10061-01-5	< 48 U	< 4.9 U	< 31 U	< 24 U	< 46 U
Ethylbenzene	100-41-4	< 46 U	< 4.6 U	< 30 U	< 23 U	< 44 U
Dichlorodifluoromethane (Freon 12)	75-71-8	< 53 U	< 5.3 U	< 34 U	< 26 U	< 50 U
Methyl Tert-Butyl Ether	1634-04-4	< 38 U	< 3.9 U	< 25 U	< 19 U	< 37 U
Methylene Chloride	75-09-2	< 18 U	< 1.9 U	< 12 U	< 9.2 U	< 18 U
Styrene	100-42-5	< 45 U	< 4.6 U	< 29 U	< 23 U	< 43 U
Tetrachloroethene	127-18-4	**64**	**0.88**	**32**	< 3.6 U	**31**
Toluene	108-88-3	< 20 U	< 2.0 U	< 13 U	< 10 U	< 19 U
trans-1,2-Dichloroethene	156-60-5	< 21 U	**8.6**	< 14 U	< 11 U	< 20 U
trans-1,3-Dichloropropene	10061-02-6	< 24 U	< 2.4 U	< 16 U	< 12 U	< 23 U
Trichloroethylene	79-01-6	**1,500**	**120**	**1,100**	**120**	**960**
Trichlorofluoromethane (Freon 11)	75-69-4	< 30 U	**11**	< 19 U	< 15 U	< 29 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 8.2 U	< 0.82 U	< 5.3 U	< 4.1 U	< 7.8 U
Vinyl chloride	75-01-4	< 14 U	**4.9**	< 8.8 U	< 6.8 U	< 13 U
Xylene-o	95-47-6	< 46 U	< 4.6 U	< 30 U	< 23 U	< 44 U
Xylenes - m,p	179601-23-1	< 92 U	< 9.3 U	< 60 U	< 46 U	< 88 U
TVOC[2]		**3,348**	**840**	**2,421**	**1,025**	**2,348**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-602 11/25/2008	VSP-601 12/18/2008	VSP-602 12/18/2008	VSP-601 3/19/2009	VSP-601 6/26/2009
	CAS No.					
1,1,1-Trichloroethane	71-55-6	**23**	**75 J**	< 18 U	**57 J**	**24**
1,1,2,2-Tetrachloroethane	79-34-5	< 4.4 U	< 4.2 UJ	< 4.5 U	< 4.0 UJ	< 1.5 U
1,1,2-Trichloroethane	79-00-5	< 17 U	< 17 UJ	< 18 U	< 16 UJ	< 1.5 U
1,1-Dichloroethane	75-34-3	**32**	**33 J**	**29**	**30 J**	**17**
1,1-Dichloroethene	75-35-4	< 13 U	< 12 UJ	< 13 U	< 12 UJ	**3.9**
1,2-Dichloroethane	107-06-2	< 13 U	< 12 UJ	< 13 U	< 12 UJ	< 1.5 U
1,2-Dichloropropane	78-87-5	< 15 U	< 14 UJ	< 15 U	< 14 UJ	< 1.5 U
1,3-Butadiene	106-99-0	< 14 U	< 13 UJ	< 14 U	< 13 UJ	< 1.5 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	--	--	--	--	**820 D**
2-Butanone	78-93-3	< 19 U	< 18 UJ	< 19 U	< 17 UJ	**6.4**
2-Hexanone	591-78-6	< 13 U	< 12 UJ	< 13 U	< 12 UJ	< 1.5 U
4-Methyl-2-Pentanone	108-10-1	< 26 U	< 25 UJ	< 27 U	< 24 UJ	< 1.5 U
Acetone	67-64-1	< 38 U	< 36 UJ	< 39 U	< 130 UJ	**25**
Benzene	71-43-2	< 10 U	**63 J**	< 10 U	**15 J**	**120**
Bromodichloromethane	75-27-4	< 4.3 U	< 4.1 UJ	< 4.4 U	< 4.0 UJ	< 1.5 U
Bromoform	75-25-2	< 33 U	< 31 UJ	< 34 U	< 31 UJ	< 1.5 U
Bromomethane	74-83-9	< 12 U	< 12 UJ	< 13 U	< 12 UJ	< 1.5 U
Carbon Disulfide	75-15-0	< 10 U	< 9.5 UJ	< 10 U	< 9.1 UJ	< 1.5 U
Carbon Tetrachloride	56-23-5	< 4.0 U	< 3.8 UJ	< 4.1 U	< 3.8 UJ	< 1.5 U
Chlorobenzene	108-90-7	< 15 U	< 14 UJ	< 15 U	< 14 UJ	< 1.5 U
Chlorodibromomethane	124-48-1	< 5.4 U	< 5.2 UJ	< 5.5 U	< 5.1 UJ	< 1.5 U
Chlorodifluoromethane (Freon 22)	75-45-6	--	--	--	--	**260 D**
Chloroethane	75-00-3	< 17 U	< 16 UJ	< 17 U	< 16 UJ	< 1.5 U
Chloroform	67-66-3	**53**	**52 J**	**42**	**30 J**	**18**
Chloromethane	74-87-3	< 13 U	< 13 UJ	< 13 U	< 12 UJ	< 1.5 U
cis-1,2-Dichloroethene	156-59-2	**770**	**1,000 J**	**730**	**1,400 DJ**	**960 D**
cis-1,3-Dichloropropene	10061-01-5	< 29 U	< 28 UJ	< 30 U	< 27 UJ	< 1.5 U
Ethylbenzene	100-41-4	< 28 U	< 26 UJ	< 28 U	< 25 UJ	< 1.5 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**69**	< 30 UJ	< 32 U	< 29 UJ	**10**
Methyl Tert-Butyl Ether	1634-04-4	< 23 U	< 22 UJ	< 23 U	< 21 UJ	< 1.5 U
Methylene Chloride	75-09-2	< 11 U	< 11 UJ	< 11 U	< 10 UJ	< 1.5 U
Styrene	100-42-5	< 27 U	< 26 UJ	< 28 U	< 25 UJ	< 1.5 U
Tetrachloroethene	127-18-4	< 4.3 U	**21 J**	< 4.4 U	**24 J**	**22**
Toluene	108-88-3	< 12 U	**12 J**	< 12 U	**11 J**	< 1.5 U
trans-1,2-Dichloroethene	156-60-5	< 13 U	< 12 UJ	< 13 U	< 12 UJ	**9.4**
trans-1,3-Dichloropropene	10061-02-6	< 14 U	< 14 UJ	< 15 U	< 13 UJ	< 1.5 U
Trichloroethylene	79-01-6	**310**	**710 J**	**130**	**920 J**	**720 D**
Trichlorofluoromethane (Freon 11)	75-69-4	< 18 U	< 17 UJ	< 18 U	< 17 UJ	**4.0**
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 4.9 U	< 4.7 UJ	< 5.0 U	< 4.6 UJ	< 1.5 U
Vinyl chloride	75-01-4	< 8.2 U	< 7.8 UJ	< 8.3 U	< 2.7 UJ	**1.7**
Xylene-o	95-47-6	< 28 U	< 26 UJ	< 28 U	< 25 UJ	< 1.5 U
Xylenes - m,p	179601-23-1	< 55 U	< 53 UJ	< 57 U	< 51 UJ	< 2.9 U
TVOC[2]		**1,257**	**1,966**	**931**	**2,487**	**3,021**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 9/29/2009	VSP-601 12/2/2009	VSP-601 3/12/2010	VSP-601 6/7/2010	VSP-601 8/30/2010
	CAS No.					
1,1,1-Trichloroethane	71-55-6	**26**	**22**	**18**	**12**	**22**
1,1,2,2-Tetrachloroethane	79-34-5	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
1,1,2-Trichloroethane	79-00-5	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
1,1-Dichloroethane	75-34-3	**19**	**16**	**14**	**10**	**17**
1,1-Dichloroethene	75-35-4	**3.9**	**3.8**	**5.2**	< 4.2 U	< 7.2 U
1,2-Dichloroethane	107-06-2	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
1,2-Dichloropropane	78-87-5	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
1,3-Butadiene	106-99-0	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	**680 D**	**350 D**	**340 D**	**690**	**670**
2-Butanone	78-93-3	**2.0**	**3.7**	< 7.3 U	< 42 U	< 72 U
2-Hexanone	591-78-6	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
4-Methyl-2-Pentanone	108-10-1	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Acetone	67-64-1	< 15 U	< 15 U	< 7.3 U	< 42 U	< 72 U
Benzene	71-43-2	**14**	**140**	**57**	**160**	< 7.2 U
Bromodichloromethane	75-27-4	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Bromoform	75-25-2	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Bromomethane	74-83-9	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Carbon Disulfide	75-15-0	**1.7**	< 1.5 U	< 7.3 U	< 42 U	< 72 U
Carbon Tetrachloride	56-23-5	< 1.5 U	< 1.5 U	**0.77**	< 4.2 U	< 7.2 U
Chlorobenzene	108-90-7	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Chlorodibromomethane	124-48-1	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Chlorodifluoromethane (Freon 22)	75-45-6	**660 D**	**430 D**	**300 D**	**120**	**150**
Chloroethane	75-00-3	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Chloroform	67-66-3	**110**	**80**	**16**	**14**	**110**
Chloromethane	74-87-3	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
cis-1,2-Dichloroethene	156-59-2	**900 D**	**600 D**	**570 D**	**770**	**850**
cis-1,3-Dichloropropene	10061-01-5	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Ethylbenzene	100-41-4	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**5.7**	**4.4**	**4.3**	< 4.2 U	< 7.2 U
Methyl Tert-Butyl Ether	1634-04-4	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Methylene Chloride	75-09-2	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Styrene	100-42-5	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Tetrachloroethene	127-18-4	**31**	**19**	**15**	**28**	**43**
Toluene	108-88-3	< 1.5 U	**2.2**	**1.3**	< 4.2 U	< 7.2 U
trans-1,2-Dichloroethene	156-60-5	**10**	**6.2**	**8.0**	**5.0**	**10**
trans-1,3-Dichloropropene	10061-02-6	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Trichloroethylene	79-01-6	**1,000 D**	**750 D**	**540 D**	**730**	**1,100**
Trichlorofluoromethane (Freon 11)	75-69-4	**3.3**	**2.6**	**2.7**	< 4.2 U	< 7.2 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 1.5 U	< 1.5 U	**0.73**	< 4.2 U	< 7.2 U
Vinyl chloride	75-01-4	< 1.5 U	**1.8**	**2.1**	< 4.2 U	< 7.2 U
Xylene-o	95-47-6	< 1.5 U	< 1.5 U	< 0.73 U	< 4.2 U	< 7.2 U
Xylenes - m,p	179601-23-1	< 3.0 U	< 3.1 U	< 1.5 U	< 8.4 U	< 14 U
TVOC[2]		**3,467**	**2,432**	**1,895**	**2,539**	**2,972**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 12/3/2010	VSP-601 1/5/2011[3]	VSP-601 3/7/2011	VSP-601 6/8/2011	VSP-601 9/19/2011
	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 0.71 U	**17**	**17**	**11**	**17**
1,1,2,2-Tetrachloroethane	79-34-5	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
1,1,2-Trichloroethane	79-00-5	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
1,1-Dichloroethane	75-34-3	< 0.71 U	**16**	**13**	**11**	**14**
1,1-Dichloroethene	75-35-4	< 0.71 U	**5.5**	**4.9**	**5.7**	**4.3**
1,2-Dichloroethane	107-06-2	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
1,2-Dichloropropane	78-87-5	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
1,3-Butadiene	106-99-0	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	**1.2**	**170**	**210**	**560 D**	**360 D**
2-Butanone	78-93-3	< 7.1 U	< 15 U	< 44 U	< 7.8 U	< 16 U
2-Hexanone	591-78-6	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
4-Methyl-2-Pentanone	108-10-1	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Acetone	67-64-1	< 7.1 U	< 15 U	< 44 U	**14**	< 16 U
Benzene	71-43-2	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Bromodichloromethane	75-27-4	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Bromoform	75-25-2	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Bromomethane	74-83-9	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Carbon Disulfide	75-15-0	< 7.1 U	< 15 U	< 44 U	< 7.8 U	< 16 U
Carbon Tetrachloride	56-23-5	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Chlorobenzene	108-90-7	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Chlorodibromomethane	124-48-1	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Chlorodifluoromethane (Freon 22)	75-45-6	**0.91**	**91**	**95**	**24**	**25**
Chloroethane	75-00-3	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Chloroform	67-66-3	< 0.71 U	**63**	**40**	**23**	**98**
Chloromethane	74-87-3	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
cis-1,2-Dichloroethene	156-59-2	**2.7**	**590 D**	**680**	**620 D**	**580 D**
cis-1,3-Dichloropropene	10061-01-5	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Ethylbenzene	100-41-4	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**2.2**	**3.0**	< 4.4 U	**3.2**	**5.3**
Methyl Tert-Butyl Ether	1634-04-4	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Methylene Chloride	75-09-2	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Styrene	100-42-5	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Tetrachloroethene	127-18-4	< 0.71 U	**17**	**15**	**21**	**25**
Toluene	108-88-3	**1.4**	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
trans-1,2-Dichloroethene	156-60-5	< 0.71 U	**5.5**	< 4.4 U	**4.8**	**6.5**
trans-1,3-Dichloropropene	10061-02-6	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Trichloroethylene	79-01-6	**3.0**	**630 D**	**670**	**590 D**	**680 D**
Trichlorofluoromethane (Freon 11)	75-69-4	**1.3**	**2.4**	< 4.4 U	**1.7**	**1.9**
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Vinyl chloride	75-01-4	< 0.71 U	**1.7**	< 4.4 U	**1.3**	**1.7**
Xylene-o	95-47-6	< 0.71 U	< 1.5 U	< 4.4 U	< 0.78 U	< 1.6 U
Xylenes - m,p	179601-23-1	< 1.4 U	< 2.9 U	< 8.8 U	< 1.6 U	< 3.2 U
TVOC[2]		**13**	**1,612**	**1,745**	**1,891**	**1,819**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 12/5/2011	VSP-601 3/9/2012	VSP-601 6/4/2012	VSP-601 9/17/2012	VSP-601 12/20/2012
	CAS No.					
1,1,1-Trichloroethane	71-55-6	**11**	**7.3**	**8.8**	**14**	**13**
1,1,2,2-Tetrachloroethane	79-34-5	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
1,1,2-Trichloroethane	79-00-5	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
1,1-Dichloroethane	75-34-3	**11**	**7.7**	**7.0**	**12**	**13**
1,1-Dichloroethene	75-35-4	**3.3**	< 2.8 U	**1.7**	**2.0**	**2.7**
1,2-Dichloroethane	107-06-2	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
1,2-Dichloropropane	78-87-5	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
1,3-Butadiene	106-99-0	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	**150 D**	**270**	**240 D**	**380 D**	**140**
2-Butanone	78-93-3	< 7.5 U	< 28 U	< 8.7 U	< 8.2 U	< 8.4 U
2-Hexanone	591-78-6	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
4-Methyl-2-Pentanone	108-10-1	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Acetone	67-64-1	< 7.5 U	< 28 U	**11**	< 8.2 U	< 8.4 U
Benzene	71-43-2	**2.5**	< 2.8 U	**3.5**	**28**	**12**
Bromodichloromethane	75-27-4	**1.1**	< 2.8 U	**1.2**	< 0.82 U	< 0.84 U
Bromoform	75-25-2	< 0.75 U	< 2.8 U	**1.3**	< 0.82 U	< 0.84 U
Bromomethane	74-83-9	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Carbon Disulfide	75-15-0	< 7.5 U	< 28 U	< 8.7 U	< 8.2 U	< 8.4 U
Carbon Tetrachloride	56-23-5	< 0.75 U	< 2.8 U	< 0.87 U	**1.1**	< 0.84 U
Chlorobenzene	108-90-7	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Chlorodibromomethane	124-48-1	< 0.75 U	< 2.8 U	**0.95**	< 0.82 U	< 0.84 U
Chlorodifluoromethane (Freon 22)	75-45-6	**17**	**13**	**8.6**	**6.1**	**5.5**
Chloroethane	75-00-3	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Chloroform	67-66-3	**83**	**11**	**13**	**81**	**120**
Chloromethane	74-87-3	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
cis-1,2-Dichloroethene	156-59-2	**540 D**	**460**	**410 D**	**440 D**	**460 D**
cis-1,3-Dichloropropene	10061-01-5	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Ethylbenzene	100-41-4	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**2.6**	< 2.8 U	**2.2**	**3.8**	**2.9**
Methyl Tert-Butyl Ether	1634-04-4	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Methylene Chloride	75-09-2	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Styrene	100-42-5	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Tetrachloroethene	127-18-4	**15**	**11**	**20**	**26**	**17**
Toluene	108-88-3	**1.8**	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
trans-1,2-Dichloroethene	156-60-5	**3.8**	< 2.8 U	**3.2**	**5.3**	**4.3**
trans-1,3-Dichloropropene	10061-02-6	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Trichloroethylene	79-01-6	**560 D**	**440**	**460 D**	**600 D**	**530 D**
Trichlorofluoromethane (Freon 11)	75-69-4	**1.4**	< 2.8 U	**2.3**	**2.3**	**1.6**
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Vinyl chloride	75-01-4	**1.6**	< 2.8 U	< 0.87 U	< 0.82 U	**0.95**
Xylene-o	95-47-6	< 0.75 U	< 2.8 U	< 0.87 U	< 0.82 U	< 0.84 U
Xylenes - m,p	179601-23-1	**1.6**	< 5.6 U	< 1.7 U	< 1.6 U	< 1.7 U
TVOC[2]		**1,407**	**1,220**	**1,195**	**1,602**	**1,323**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 3/28/2013	VSP-601 6/19/2013	VSP-601 9/5/2013	VSP-601 12/4/2013	VSP-601 3/11/2014
	CAS No.					
1,1,1-Trichloroethane	71-55-6	**8.4**	**11**	**14**	**13**	**7.6**
1,1,2,2-Tetrachloroethane	79-34-5	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
1,1,2-Trichloroethane	79-00-5	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
1,1-Dichloroethane	75-34-3	**9.4**	**7.9**	**11**	**11**	**6.9**
1,1-Dichloroethene	75-35-4	**3.0**	**2.4**	**2.1**	**1.6**	< 2.0 U
1,2-Dichloroethane	107-06-2	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
1,2-Dichloropropane	78-87-5	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
1,3-Butadiene	106-99-0	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	**160 D**	**230 D**	**380 D**	**170**	**150**
2-Butanone	78-93-3	< 8.0 U	< 7.5 U	< 7.7 U	< 9.1 U	< 20 U
2-Hexanone	591-78-6	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
4-Methyl-2-Pentanone	108-10-1	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Acetone	67-64-1	< 8.0 U	< 7.5 U	< 7.7 U	< 9.1 U	< 20 U
Benzene	71-43-2	**1.5**	**2.6**	**15**	< 0.91 U	**18**
Bromodichloromethane	75-27-4	< 0.80 U	< 0.75 U	**1.2**	< 0.91 U	< 2.0 U
Bromoform	75-25-2	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Bromomethane	74-83-9	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Carbon Disulfide	75-15-0	< 8.0 U	< 7.5 U	< 7.7 U	< 9.1 U	< 20 U
Carbon Tetrachloride	56-23-5	< 0.80 U	**0.78**	**0.96**	< 0.91 U	< 2.0 U
Chlorobenzene	108-90-7	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Chlorodibromomethane	124-48-1	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Chlorodifluoromethane (Freon 22)	75-45-6	**4.1**	**4.2**	**7.0**	**3.0**	**2.8**
Chloroethane	75-00-3	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Chloroform	67-66-3	**18**	**14**	**17**	**38**	**8.0**
Chloromethane	74-87-3	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
cis-1,2-Dichloroethene	156-59-2	**430 D**	**470 D**	**490 D**	**500 D**	**320**
cis-1,3-Dichloropropene	10061-01-5	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Ethylbenzene	100-41-4	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**2.4**	**2.5**	**3.3**	**2.5**	**2.2**
Methyl Tert-Butyl Ether	1634-04-4	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Methylene Chloride	75-09-2	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Styrene	100-42-5	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Tetrachloroethene	127-18-4	**1.4**	**17**	**26**	**14**	**7.9**
Toluene	108-88-3	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
trans-1,2-Dichloroethene	156-60-5	**2.6**	**2.9**	**4.8**	**3.3**	< 2.0 U
trans-1,3-Dichloropropene	10061-02-6	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Trichloroethylene	79-01-6	**260 D**	**470 D**	**620 D**	**570 D**	**300**
Trichlorofluoromethane (Freon 11)	75-69-4	**1.5**	**2.1**	**1.8**	**1.3**	< 2.0 U
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Vinyl chloride	75-01-4	**1.6**	**0.97**	**0.85**	**0.92**	< 2.0 U
Xylene-o	95-47-6	< 0.80 U	< 0.75 U	< 0.77 U	< 0.91 U	< 2.0 U
Xylenes - m,p	179601-23-1	< 1.6 U	< 1.5 U	< 1.5 U	< 1.8 U	< 3.9 U
TVOC[2]		**904**	**1,238**	**1,595**	**1,329**	**823**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/m^3)	Sample ID: / Sample Date:	VSP-601 6/20/2014	VSP-601 9/10/2014	VSP-601 12/10/2014
	CAS No.			
1,1,1-Trichloroethane	71-55-6	**7.3**	**6.3**	**15**
1,1,2,2-Tetrachloroethane	79-34-5	< 0.70 U	< 0.77 U	< 0.69 U
1,1,2-Trichloroethane	79-00-5	< 0.70 U	< 0.77 U	< 0.55 U
1,1-Dichloroethane	75-34-3	**6.2**	**5.4**	**14**
1,1-Dichloroethene	75-35-4	**1.4**	**0.77**	**1.7**
1,2-Dichloroethane	107-06-2	< 0.70 U	< 0.77 U	< 0.81 U
1,2-Dichloropropane	78-87-5	< 0.70 U	< 0.77 U	< 0.92 U
1,3-Butadiene	106-99-0	< 0.70 U	< 0.77 U	< 0.44 U
1-Chloro-1,1-difluoroethane (Freon 142b)	75-68-3	**260 D**	**150**	**120**
2-Butanone	78-93-3	< 7.0 U	< 7.7 U	< 0.59 U
2-Hexanone	591-78-6	< 0.70 U	**0.86**	< 0.82 U
4-Methyl-2-Pentanone	108-10-1	< 0.70 U	< 0.77 U	< 0.82 U
Acetone	67-64-1	**7.1**	**15**	**1.7**
Benzene	71-43-2	< 0.70 U	**2.7**	**2.7**
Bromodichloromethane	75-27-4	< 0.70 U	< 0.77 U	< 0.67 U
Bromoform	75-25-2	< 0.70 U	< 0.77 U	< 0.41 U
Bromomethane	74-83-9	< 0.70 U	< 0.77 U	< 0.78 U
Carbon Disulfide	75-15-0	< 7.0 U	< 7.7 U	< 0.62 U
Carbon Tetrachloride	56-23-5	< 0.70 U	< 0.77 U	**0.69**
Chlorobenzene	108-90-7	< 0.70 U	< 0.77 U	< 0.92 U
Chlorodibromomethane	124-48-1	< 0.70 U	< 0.77 U	< 0.85 U
Chlorodifluoromethane (Freon 22)	75-45-6	**1.2**	**1.1**	**3.9**
Chloroethane	75-00-3	< 0.70 U	< 0.77 U	< 0.53 U
Chloroform	67-66-3	**9.8**	**7.7**	**14**
Chloromethane	74-87-3	< 0.70 U	< 0.77 U	< 0.41 U
cis-1,2-Dichloroethene	156-59-2	**410 D**	**190 D**	**519**
cis-1,3-Dichloropropene	10061-01-5	< 0.70 U	< 0.77 U	< 0.91 U
Ethylbenzene	100-41-4	< 0.70 U	< 0.77 U	< 0.87 U
Dichlorodifluoromethane (Freon 12)	75-71-8	**2.1**	**2.1**	**3.1**
Methyl Tert-Butyl Ether	1634-04-4	< 0.70 U	< 0.77 U	< 0.72 U
Methylene Chloride	75-09-2	< 0.70 U	< 0.77 U	**0.76**
Styrene	100-42-5	< 0.70 U	< 0.77 U	< 0.85 U
Tetrachloroethene	127-18-4	**13**	**14**	**15**
Toluene	108-88-3	**0.75**	< 0.77 U	< 0.75 U
trans-1,2-Dichloroethene	156-60-5	**2.5**	**2.5**	**3.8**
trans-1,3-Dichloropropene	10061-02-6	< 0.70 U	< 0.77 U	< 0.91 U
Trichloroethylene	79-01-6	**390 D**	**320 D**	**570**
Trichlorofluoromethane (Freon 11)	75-69-4	**1.2**	**1.6**	**1.6**
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 0.70 U	< 0.77 U	< 0.77 U
Vinyl chloride	75-01-4	**0.99**	< 0.77 U	**1.3**
Xylene-o	95-47-6	< 0.70 U	< 0.77 U	< 0.87 U
Xylenes - m,p	179601-23-1	< 1.4 U	< 1.5 U	< 0.87 U
TVOC[2]		**1,114**	**720**	**1,289**

Notes and abbreviations on last page.

Appendix A-1. Total Effluent Vapor Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.(1)

Notes and Abbreviations:

Bold	Bold data indicates that the analyte was detected at or above its reporting limit.
CAS No.	Chemical Abstracts Service list number.
D	Compound detected at a secondary dilution.
ELAP	Environmental Laboratory Approval Program.
NYSDOH	New York State Department of Health.
TVOC	total volatile organic compounds
µg/m^3	micrograms per cubic meter
USEPA	U.S. Environmental Protection Agency.
<	Compound not detected above its laboratory quantification limit.

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.
2. TVOC determined by summing individual detections and rounding to the nearest whole number.
3. Analytical results from the total effluent vapor sample collected on December 3, 2010 were not consistent with recent historical trends. Analytical results used in calculations in this table are from the total effluent vapor sample that was recollected on January 5, 2011. System parameter readings used in calculations in this table were collected on December 3, 2010.

Appendix A-2. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2,3,4]

	Sample ID:	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601
	Sample Date:	12/2/2009	3/12/2010	6/7/2010	12/3/2010	6/8/2011	9/19/2011
	Units:	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
1-Decene		--	--	--	--	--	--
1-Dodecene		--	--	--	--	**9.1 JN**	--
1-Methylnaphthalene		--	--	--	--	--	--
1-Tridecene		--	--	--	--	--	--
2,2,4-Trimethylpentane		--	--	--	--	**4.9 JN**	--
2,3,3-Trimethylpentane		--	--	--	--	**7 JN**	--
2,3,4-Trimethylpentane		--	--	--	--	--	--
2-Ethylnaphthalene		--	--	--	--	--	--
2-Hydroxypropyl methacrylate		--	--	--	--	--	--
2-Methyldecane		--	--	--	--	--	**10 JN**
2-Methylnaphthalene		--	--	--	--	--	--
2-Methylpropane		--	**6 JN**	--	--	**11 JN**	--
2-Phenyl-2-propanol		**280 JN**	**8.1 JN**	**56 JN**	--	--	--
3-Hydroxypropyl-methacrylate		**50 JN**	--	--	--	--	--
Acetaldehyde		--	--	--	--	--	--
Acetophenone		**330 JN**	**11 JN**	**45 JN**	--	--	--
Benzaldehyde		**32 JN**	**3.9 JN**	--	--	--	--
Butylformate		--	--	--	--	--	--
Butyraldehyde		--	--	--	--	--	--
C10H20 + Unidentified compound		--	--	--	--	--	--
C11H16 compound		--	--	--	--	--	--
C13H14 Compound		--	--	--	--	--	--
C14H28 Alkene		--	--	--	--	--	--
C14H28 Compound		--	--	--	--	--	--
C8H18 Compound		--	--	**24 JN**	--	--	--
C8H8O2 Compound		--	--	--	--	--	--
C9H10O compound		--	--	--	--	--	--
C9H12O Compound		--	--	--	--	--	--
Diethylene glycol, monobutyl ether		--	--	--	--	--	--
Dimethylnaphthalene Isomer		--	--	--	--	--	--
Dimethylnaphthalene Isomer		--	--	--	--	--	--
Dimethylnaphthalene Isomer		--	--	--	--	--	--
Dimethylnaphthalene Isomer		--	--	--	--	--	--
Dimethylnaphthalene Isomer		--	--	--	--	--	--
Ethylene glycol, monobutyl ether		--	**5.5 JN**	--	--	--	--
Ethyleneglycol monohexylether		--	--	--	--	--	--
Heptylbenzene		--	--	--	--	--	--
Hexamethylcyclotrisiloxane		--	**6 JN**	**620 JN**	--	--	--
Isobutylene		--	--	--	--	**4.3 JN**	--
Methyl Disulfide		--	--	--	--	--	--
Methyl Methacrylate		--	--	--	--	--	--
Methyl styrene (alpha)		**82 JN**	**7.3 JN**	**31 JN**	--	--	--
N-Butyl Alcohol		--	--	--	--	--	--
n-Dodecane + Unidentified Compound		--	--	--	--	--	--
N-Tetradecane		--	--	--	--	--	--

Notes and abbreviations on next page.

Appendix A-2. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2,3,4]

Sample ID:	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601
Sample Date:	12/2/2009	3/12/2010	6/7/2010	12/3/2010	6/8/2011	9/19/2011
Units:	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
N-Tridecane	--	--	--	--	--	--
Pentadecane	--	--	--	--	--	--
Pentanal	--	--	--	--	--	--
Phenol	--	--	--	--	--	--
Propylene Glycol	--	--	--	--	--	--
Silanol, trimethyl-	--	--	--	--	--	--
Substituted 1H-Indene	--	--	--	--	--	--
Substituted 1H-Indene	--	--	--	--	--	--
Substituted Tetrahydronaphthalene	--	--	--	--	--	--
Substituted Tetrahydronaphthalene	--	--	--	--	--	--
Substituted Tetrahydronaphthalene + C13H12 compound	--	--	--	--	--	--
Tetradecene isomer	--	--	--	--	--	--
Unidentified Oxygenated Compound	**17 JN**	--	--	**5.5 JN**	--	--
Unidentified Oxygenated Compound	**11 JN**	--	--	--	--	--
Unidentified Siloxane	--	--	**200 JN**	--	--	--
Unidentified Siloxane	--	--	**53 JN**	--	--	--
Unknown	--	--	--	--	**4.7 JN**	--
Unknown	--	--	--	--	--	--
Unknown	--	--	--	--	--	--
Unknown 1-Propene, 2-methyl-	--	--	--	--	--	--
Unknown 1-Propene, 2-methyl-	--	--	--	--	--	--
Unknown C10H20 Compound	--	--	--	--	**7.5 JN**	--
Unknown C10H20 Compound	--	--	--	--	**5.2 JN**	--
Unknown C11H14 Compound with 1st Highest Conc	--	--	--	--	--	--
Unknown C12H24 Compound	--	--	--	--	--	--
Unknown C13H26 Compound	--	--	--	--	--	--
Unknown C7H10 Compound	--	--	**33 JN**	--	--	--
Unknown C9H18 Compound	--	--	--	--	**12 JN**	--
Unknown C9H18 Compound	--	--	--	--	**6.8 JN**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**13 JN**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**7.3 JN**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**6.7 JN**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**4.6 JN**	--

Notes and abbreviations:

ELAP	Environmental Laboratory Approval Program.
JN	Compound tentatively identified, concentration is estimated.
NA	Unidentified compound detected but estimated concentration cannot be calculated.
ND	Unidentified compound detected historically, but not detected during this reporting period.
NF	Compound was searched for, but not found.
NYSDOH	New York State Department of Health.
ug/m3	micrograms per cubic meter.
USEPA	U.S. Environmental Protection Agency.

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.
2. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
3. All results are estimated.
4. Results prior to 2009 are provided in Appendix A-3.

Appendix A-2. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2,3,4]

Sample ID:	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601
Sample Date:	12/5/2011	6/4/2012	9/17/2012	12/20/2012	3/28/2013	6/19/2013
Units:	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
1-Decene	--	--	**3.8 JN**	--	--	**3.1 JN**
1-Dodecene	--	--	**9.2 JN**	--	--	**6.9 JN**
1-Methylnaphthalene	--	--	--	--	--	--
1-Tridecene	--	--	--	--	--	--
2,2,4-Trimethylpentane	--	--	**22 JN**	--	--	--
2,3,3-Trimethylpentane	--	--	**8.5 JN**	--	--	--
2,3,4-Trimethylpentane	--	--	**5.7 JN**	--	--	--
2-Ethylnaphthalene	--	--	--	--	--	--
2-Hydroxypropyl methacrylate	--	--	--	--	--	--
2-Methyldecane	--	--	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--
2-Methylpropane	**4.1 JN**	--	**4.1 JN**	--	**3.4 JN**	**7.0 JN**
2-Phenyl-2-propanol	--	--	**41 JN**	**25 JN**	--	**130 JN**
3-Hydroxypropyl-methacrylate	--	--	--	--	--	--
Acetaldehyde	--	--	--	--	--	--
Acetophenone	**6.2 JN**	**18 JN**	**25 JN**	**60 JN**	--	**20 JN**
Benzaldehyde	--	**5.8 JN**	--	**4.7 JN**	--	--
Butylformate	--	--	--	--	--	--
Butyraldehyde	--	--	--	--	--	--
C10H20 + Unidentified compound	--	--	--	--	--	--
C11H16 compound	--	--	--	--	--	--
C13H14 Compound	--	--	--	--	--	--
C14H28 Alkene	--	--	--	--	--	--
C14H28 Compound	--	--	--	--	--	--
C8H18 Compound	--	--	--	--	--	--
C8H8O2 Compound	--	--	--	--	--	--
C9H10O compound	--	--	--	--	--	--
C9H12O Compound	--	--	--	--	--	--
Diethylene glycol, monobutyl ether	--	--	--	--	--	--
Dimethylnaphthalene Isomer	--	--	--	--	--	--
Dimethylnaphthalene Isomer	--	--	--	--	--	--
Dimethylnaphthalene Isomer	--	--	--	--	--	--
Dimethylnaphthalene Isomer	--	--	--	--	--	--
Dimethylnaphthalene Isomer	--	--	--	--	--	--
Ethylene glycol, monobutyl ether	--	--	--	--	--	--
Ethyleneglycol monohexylether	--	--	--	--	--	--
Heptylbenzene	--	--	--	--	--	--
Hexamethylcyclotrisiloxane	--	--	**6.8 JN**	--	--	--
Isobutylene	--	--	--	--	--	--
Methyl Disulfide	--	--	--	--	--	--
Methyl Methacrylate	--	--	--	--	--	--
Methyl styrene (alpha)	--	**51 JN**	**3.4 JN**	**6.8 JN**	--	**7.2 JN**
N-Butyl Alcohol	--	--	--	--	--	--
n-Dodecane + Unidentified Compound	--	--	--	--	--	--
N-Tetradecane	--	--	--	--	--	--

Notes and abbreviations on next page.

Appendix A-2. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2,3,4]

Sample ID:	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601
Sample Date:	12/5/2011	6/4/2012	9/17/2012	12/20/2012	3/28/2013	6/19/2013
Units:	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
N-Tridecane	--	--	--	--	--	--
Pentadecane	--	--	--	--	--	--
Pentanal	--	--	--	--	--	--
Phenol	--	--	--	--	--	--
Propylene Glycol	--	--	--	--	--	--
Silanol, trimethyl-	--	--	--	--	--	--
Substituted 1H-Indene	--	--	--	--	--	--
Substituted 1H-Indene	--	--	--	--	--	--
Substituted Tetrahydronaphthalene	--	--	--	--	--	--
Substituted Tetrahydronaphthalene	--	--	--	--	--	--
Substituted Tetrahydronaphthalene + C13H12 compound	--	--	--	--	--	--
Tetradecene isomer	--	--	--	--	--	--
Unidentified Oxygenated Compound	--	--	--	--	--	--
Unidentified Oxygenated Compound	--	--	--	--	--	--
Unidentified Siloxane	--	--	**3.7 JN**	--	**--**	--
Unidentified Siloxane	--	--	--	--	--	--
Unknown	--	--	**4.1 JN**	--	--	**12 JN**
Unknown	--	--	--	--	--	**5.4 JN**
Unknown	--	--	--	--	--	**3.2 JN**
Unknown 1-Propene, 2-methyl-	--	--	--	--	--	--
Unknown 1-Propene, 2-methyl-	--	--	--	--	--	**--**
Unknown C10H20 Compound	--	--	--	--	--	--
Unknown C10H20 Compound	--	--	--	--	--	--
Unknown C11H14 Compound with 1st Highest Conc	--	--	--	--	--	--
Unknown C12H24 Compound	--	**5.0 JN**	--	--	--	--
Unknown C13H26 Compound	--	--	--	--	--	--
Unknown C7H10 Compound	--	--	--	--	**--**	--
Unknown C9H18 Compound	--	--	--	--	**--**	--
Unknown C9H18 Compound	--	--	--	--	**--**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**--**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**--**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**--**	--
Unknown Trimethylcyclohexane isomer	--	--	--	--	**--**	--

Notes and abbreviations:

ELAP	Environmental Laboratory Approval Program.
JN	Compound tentatively identified, concentration is estimated.
NA	Unidentified compound detected but estimated concentration cannot be calculated.
ND	Unidentified compound detected historically, but not detected during this reporting period.
NF	Compound was searched for, but not found.
NYSDOH	New York State Department of Health.
ug/m3	micrograms per cubic meter.
USEPA	U.S. Environmental Protection Agency.

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.
2. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
3. All results are estimated.
4. Results prior to 2009 are provided in Appendix A-3.

Appendix A-2. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2,3,4]

Sample ID:	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601
Sample Date:	9/5/2013	12/4/2013	3/11/2014	6/20/2014	9/10/2014
Units:	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
1-Decene	**5.2 JN**		--	**3.8 JN**	--
1-Dodecene	--		--	**7.1 JN**	--
1-Methylnaphthalene	--		**410 JN**	**--**	--
1-Tridecene	--		--	**13 JN**	--
2,2,4-Trimethylpentane	--		--	**--**	--
2,3,3-Trimethylpentane	--		--	**--**	--
2,3,4-Trimethylpentane	--		--	**--**	--
2-Ethylnaphthalene	--		--	**9.7 JN**	--
2-Hydroxypropyl methacrylate	**75 JN**		--	**--**	--
2-Methyldecane	--		--	**--**	--
2-Methylnaphthalene	--		**420 JN**	**--**	--
2-Methylpropane	--		--	**--**	--
2-Phenyl-2-propanol	**440 JN**		**22 JN**	**0 NF**	--
3-Hydroxypropyl-methacrylate	--		--	**--**	--
Acetaldehyde	--		--	**--**	**9.6 JN**
Acetophenone	**390 JN**		**23 JN**	**0 NF**	**13 JN**
Benzaldehyde	**31 JN**		--	**--**	--
Butylformate	**12 JN**		--	**--**	--
Butyraldehyde	**18 JN**		--	**--**	**4.1 JN**
C10H20 + Unidentified compound	--		--	**--**	**6.2 JN**
C11H16 compound	--		**56 JN**	**--**	--
C13H14 Compound	--	No Tentatively Identfied Compounds Detected	--	**5.1 JN**	--
C14H28 Alkene	--		--	**20 JN**	--
C14H28 Compound	--		--	**--**	**16 JN**
C8H18 Compound	--		--	**--**	--
C8H8O2 Compound	**4.9 JN**		--	**--**	--
C9H10O compound	--		**18 JN**	**--**	--
C9H12O Compound	--		--	**--**	**12 JN**
Diethylene glycol, monobutyl ether	**31 JN**		--	**--**	--
Dimethylnaphthalene Isomer	--		--	**19 JN**	**12 JN**
Dimethylnaphthalene Isomer	--		--	**12 JN**	**9.5 JN**
Dimethylnaphthalene Isomer	--		--	**10 JN**	**9.3 JN**
Dimethylnaphthalene Isomer	--		--	**9.2 JN**	**5.6 JN**
Dimethylnaphthalene Isomer	--		--	**6.3 JN**	--
Ethylene glycol, monobutyl ether	**160 JN**		--	**--**	--
Ethyleneglycol monohexylether	**5.4 JN**		--	**--**	--
Heptylbenzene	--		**26 JN**	**--**	--
Hexamethylcyclotrisiloxane	--		--	**--**	--
Isobutylene	--		--	**--**	--
Methyl Disulfide	--		--	**3.2 JN**	--
Methyl Methacrylate	**9.8 JN**		--	**--**	--
Methyl styrene (alpha)	**43 JN**		--	**0 NF**	--
N-Butyl Alcohol	**14 JN**		--	**--**	--
n-Dodecane + Unidentified Compound	--		**40 JN**	**--**	--
N-Tetradecane	--		**180 JN**	**11 JN**	**9.8 JN**

Notes and abbreviations on next page.

Appendix A-2. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1,2,3,4]

Sample ID:	VSP-601	VSP-601	VSP-601	VSP-601	VSP-601
Sample Date:	9/5/2013	12/4/2013	3/11/2014	6/20/2014	9/10/2014
Units:	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
N-Tridecane	--		**120 JN**	**--**	--
Pentadecane	--		--	**22 JN**	**60 JN**
Pentanal	--		--	**--**	**3.1 JN**
Phenol	**6.2 JN**		--	**--**	--
Propylene Glycol	**32 JN**		--	**--**	--
Silanol, trimethyl-	--		--	**--**	**3.0 JN**
Substituted 1H-Indene	--		**44 JN**	**--**	--
Substituted 1H-Indene	--		**38 JN**	**--**	--
Substituted Tetrahydronaphthalene	--		**90 JN**	**--**	--
Substituted Tetrahydronaphthalene	--		**74 JN**	**--**	--
Substituted Tetrahydronaphthalene + C13H12 compound	--		**34 JN**	**--**	--
Tetradecene isomer	--		**520 JN**	**--**	--
Unidentified Oxygenated Compound	--		--	**--**	--
Unidentified Oxygenated Compound	--		--	--	--
Unidentified Siloxane	--		--	**--**	--
Unidentified Siloxane	--		--	--	--
Unknown	**34 JN**		**46 JN**	**3.1 JN**	**21 JN**
Unknown	**18 JN**		--	**--**	**5.6 JN**
Unknown	**4.5 JN**		--	**--**	--
Unknown 1-Propene, 2-methyl-	--		--	**3.6 JN**	--
Unknown 1-Propene, 2-methyl-	--		**--**	**2.9 JN**	**--**
Unknown C10H20 Compound	--		--	**--**	**--**
Unknown C10H20 Compound	--		**--**	**--**	**--**
Unknown C11H14 Compound with 1st Highest Conc	--		**43 JN**	**--**	**--**
Unknown C12H24 Compound	**7.7 JN**		**75 JN**	**--**	**7.2 JN**
Unknown C13H26 Compound	--		**330 JN**	**--**	**--**
Unknown C7H10 Compound	--		--	--	--
Unknown C9H18 Compound	--		--	--	--
Unknown C9H18 Compound	--		--	--	--
Unknown Trimethylcyclohexane isomer	--		--	--	--
Unknown Trimethylcyclohexane isomer	--		--	--	--
Unknown Trimethylcyclohexane isomer	--		--	--	--
Unknown Trimethylcyclohexane isomer	--		--	--	--

Notes and abbreviations:

ELAP	Environmental Laboratory Approval Program.
JN	Compound tentatively identified, concentration is estimated.
NA	Unidentified compound detected but estimated concentration cannot be calculated.
ND	Unidentified compound detected historically, but not detected during this reporting period.
NF	Compound was searched for, but not found.
NYSDOH	New York State Department of Health.
ug/m3	micrograms per cubic meter.
USEPA	U.S. Environmental Protection Agency.

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.
2. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
3. All results are estimated.
4. Results prior to 2009 are provided in Appendix A-3.

Appendix A-3. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[2,3,4,5]

Location ID:	VSP-601	VSP-602	VSP-601	VSP-602	VSP-601	VSP-602	VSP-601	VSP-602
Sample Date:	02/18/08	02/18/08	02/19/08	02/19/08	02/25/08	02/25/08	03/03/08	03/03/08
Hexamethylcyclotrisiloxane [1]	--	**0.60**	--	--	--	--	--	--
Chlorodifluoromethane (Freon 22)	NF	NF	NF	NF	NF	**5.0**	**30**	**20**
Methylcyclohexane	--	--	--	--	--	--	**20**	--
Propane	--	--	--	--	--	**10**	--	**9**
Acetaldehyde	--	--	--	--	--	--	--	**3**
Unknown CFC	--	--	--	--	--	--	--	--
3-Methyl-Hexane	--	--	--	--	--	--	--	--
Heptane	--	--	--	--	--	--	--	--
Unknown aliphatic hydrocarbon	--	--	--	--	--	--	--	--
Ethane, 1-chloro-1,1-difluoro (Freon 142)	--	--	--	--	--	--	--	--
Octamethylcyclotetrasiloxane (1)	--	--	--	--	--	--	--	--
2-Methylpentane	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--
Unknown hydrocarbon	--	--	--	--	--	--	--	--
Unknown hydrocarbon	--	--	--	--	--	--	--	--
4-Methyl 1-heptene	--	--	--	--	--	--	--	--

Notes and Abbreviations:

Bold Detected.
-- Not Reported during this sampling event.
ppbv Parts per billion by volume.
NF Compound was searched for, but not found.

1. Possible laboratory artifact.
2. Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA
3. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
4. All results are estimated.
5. Results after 2008 are presented in Appendix A-2.

Appendix A-3. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[2,3,4,5]

Location ID: / Sample Date:	VSP-601 03/17/08 [b]	VSP-602 03/17/08 [b]	VSP-601 04/16/08	VSP-602 04/16/08	VSP-601 05/19/08	VSP-602 05/19/08	VSP-601 06/02/08 [b]	VSP-602 06/02/08 [b]
Hexamethylcyclotrisiloxane [1]	--	--	--	--	--	--	--	--
Chlorodifluoromethane (Freon 22)	**170**	**110**	**110**	**220**	**250**	**120**	**260**	**140**
Methylcyclohexane	**62**	--	--	--	--	--	--	--
Propane	--	--	--	--	--	--	--	--
Acetaldehyde	--	--	--	--	--	--	--	--
Unknown CFC	--	--	**400**	**110**	**220**	**180**	**250**	**160**
3-Methyl-Hexane	**6.0**	--	--	--	--	--	--	--
Heptane	**11**	--	--	--	--	--	--	--
Unknown aliphatic hydrocarbon	**7.0**	--	--	--	--	--	--	--
Ethane, 1-chloro-1,1-difluoro (Freon 142)	--	--	--	--	--	--	--	--
Octamethylcyclotetrasiloxane (1)	--	--	--	--	--	--	--	--
2-Methylpentane	--	--	--	--	--	--	--	--
Hexane	--	--	--	--	--	--	--	--
Unknown hydrocarbon	--	--	--	--	--	--	--	--
Unknown hydrocarbon	--	--	--	--	--	--	--	--
4-Methyl 1-heptene	--	--	--	--	--	--	--	--

Notes and Abbreviations:

Bold Detected.
-- Not Reported during this sampling event.
ppbv Parts per billion by volume.
NF Compound was searched for, but not found.

1. Possible laboratory artifact.
2. Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA
3. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
4. All results are estimated.
5. Results after 2008 are presented in Appendix A-2.

Appendix A-3. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[2,3,4,5]

Tentatively Identified Compounds (3) (units in ppbv)	Location ID:	VSP-601	VSP-602	VSP-601	VSP-602	VSP-601	VSP-602	VSP-601	VSP-602
	Sample Date:	07/07/08	07/07/08	08/06/08	08/06/08	09/24/08	09/24/08	10/27/08	10/27/08
Hexamethylcyclotrisiloxane [1]		--	--	--	--	--	--	--	--
Chlorodifluoromethane (Freon 22)		**280**	**210**	**170**	**150**	**270**	**140**	**200**	**210**
Methylcyclohexane		--	--	--	--	--	--	--	--
Propane		--	--	--	--	--	--	--	--
Acetaldehyde		--	--	--	--	--	--	--	--
Unknown CFC		**290**	**250**	--	--	--	--	--	--
3-Methyl-Hexane		--	--	--	--	--	--	--	--
Heptane		--	--	--	--	--	--	--	--
Unknown aliphatic hydrocarbon		--	--	--	--	--	--	--	--
Ethane, 1-chloro-1,1-difluoro (Freon 142)		--	--	**200**	**170**	**190**	**140**	**110**	**130**
Octamethylcyclotetrasiloxane		--	--	--	--	--	--	--	--
2-Methylpentane		--	--	--	--	--	--	--	--
Hexane		--	--	--	--	--	--	--	--
Unknown hydrocarbon		--	--	--	--	--	--	--	--
Unknown hydrocarbon		--	--	--	--	--	--	--	--
4-Methyl 1-heptene		--	--	--	--	--	--	--	--

Notes and Abbreviations:

Bold Detected.
-- Not Reported during this sampling event.
ppbv Parts per billion by volume.
NF Compound was searched for, but not found.

1. Possible laboratory artifact.
2. Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA
3. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
4. All results are estimated.
5. Results after 2008 are presented in Appendix A-2.

Appendix A-3. Total Effluent Vapor Sample Analytical Results, Tentatively Identified Compounds, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[2,3,4,5]

Tentatively Identified Compounds (3 (units in ppbv)	Location ID: / Sample Date:	VSP-601 11/25/08	VSP-602 11/25/08	VSP-601 12/18/08	VSP-602 12/18/08
Hexamethylcyclotrisiloxane [1]		--	--	--	**23**
Chlorodifluoromethane (Freon 22)		--	--	**460**	**260**
Methylcyclohexane		--	--	**10**	--
Propane		--	--	--	--
Acetaldehyde		--	--	--	--
Unknown CFC		--	--	--	--
3-Methyl-Hexane		--	--	**27**	--
Heptane		--	--	**12**	--
Unknown aliphatic hydrocarbon		--	--	**22**	--
Ethane, 1-chloro-1,1-difluoro (Freon 142)		**230**	**210**	**130**	**170**
Octamethylcyclotetrasiloxane		--	--	--	**9.0**
2-Methylpentane		--	--	**31**	--
Hexane		--	--	**29**	--
Unknown hydrocarbon		--	--	**21**	--
Unknown hydrocarbon		--	--	**18**	--
4-Methyl 1-heptene		--	--	**8.0**	--

Notes and Abbreviations:

Bold	Detected.
--	Not Reported during this sampling event.
ppbv	Parts per billion by volume.
NF	Compound was searched for, but not found.

1. Possible laboratory artifact.
2. Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA
3. Tentatively identified compounds are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.
4. All results are estimated.
5. Results after 2008 are presented in Appendix A-2.

ARCADIS

Appendix B

Summary of Air Modeling Calculations

Table B-1. Summary of SCREEN3 Model Input and Outputs, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Parameters	Date Sampled:	02/18/08	02/19/08	02/25/08	03/03/08	03/17/08	04/16/08	05/19/08	06/02/08
SCREEN3 Model Input									
Source Type		Point	Point	Point	Point	Point	Point	Point	Point
Emission Rate (g/s)		1	1	1	1	1	1	1	1
Stack Height (m)		10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Stack Inside Diameter (m)		0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Air Flow Rate (scfm)[(1)]		1,964	1,674	1,679	1,793	1,774	641	666	746
Air Flow Rate (acfm @ stack temp)[(2)]		2,048	1,717	1,754	1,873	1,859	655	671	766
Stack Gas Exit Temperature (K)[(1)]		307	302	308	308	309	301	296	303
Ambient Air Temperature (K)[(3)]		283	275	274	275	276	281	284	294
Receptor Height (m)[(4)]		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Urban/Rural		Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Building Height (m)		2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Min Horizontal Bldg Dim (m)		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Max Horizontal Bldg Dim (m)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Consider Bldg Downwash?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Meteorology		Full	Full	Full	Full	Full	Full	Full	Full
Automated Distances Array		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Terrain Height Above Stack Base		0	0	0	0	0	0	0	0
SCREEN3 Model Output									
1-HR Max Concentration at Receptor Height ($\mu g/m^3$)[(5)]		596.3	698.3	638.3	622.9	627.6	1292	1278	1200
Annualization Factor[(6)]		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[(7)]		47.7	55.9	51.1	49.8	50.2	103.4	102.2	96
Distance To Max Concentration (m)[(8)]		66	61	64	64	64	45	45	47

Notes and abbreviations on last page.

Table B-1. Summary of SCREEN3 Model Input and Outputs, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Parameters	Date Sampled:	07/07/08	08/06/08	09/24/08	10/27/08	11/25/08	12/18/08	03/19/09	06/26/09
SCREEN3 Model Input									
Source Type		Point	Point	Point	Point	Point	Point	Point	Point
Emission Rate (g/s)		1	1	1	1	1	1	1	1
Stack Height (m)		10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Stack Inside Diameter (m)		0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Air Flow Rate (scfm)[(1)]		829	640	638	552	487	540	534	573
Air Flow Rate (acfm @ stack temp)[(2)]		860	670	668	567	487	543	553	594
Stack Gas Exit Temperature (K)[(1)]		305	308	308	303	294	296	305	305
Ambient Air Temperature (K)[(3)]		298	299	289	286	279	275	279	300
Receptor Height (m)[(4)]		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Urban/Rural		Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Building Height (m)		2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Min Horizontal Bldg Dim (m)		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Max Horizontal Bldg Dim (m)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Consider Bldg Downwash?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Meteorology		Full	Full	Full	Full	Full	Full	Full	Full
Automated Distances Array		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Terrain Height Above Stack Base		0	0	0	0	0	0	0	0
SCREEN3 Model Output									
1-HR Max Concentration at Receptor Height ($\mu g/m^3$)[(5)]		1129	1279	1281	1373	1454	1374	1289	1348
Annualization Factor[(6)]		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[(7)]		90.3	102.3	102.5	109.8	116.3	109.9	103.1	107.8
Distance To Max Concentration (m)[(8)]		48	45	45	43	42	43	45	44

Notes and abbreviations on last page.

Table B-1. Summary of SCREEN3 Model Input and Outputs, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Parameters	Date Sampled:	09/29/09	12/02/09	03/12/10	06/07/10	08/30/10	12/03/10	03/07/11	06/06/11
SCREEN3 Model Input									
Source Type		Point	Point	Point	Point	Point	Point	Point	Point
Emission Rate (g/s)		1	1	1	1	1	1	1	1
Stack Height (m)		10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Stack Inside Diameter (m)		0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Air Flow Rate (scfm)[(1)]		595	615	606	666	587	604	761	583
Air Flow Rate (acfm @ stack temp)[(2)]		617	639	613	697	623	606	764	611
Stack Gas Exit Temperature (K)[(1)]		305	306	298	308	312	295	295	309
Ambient Air Temperature (K)[(3)]		289	286	279	287	299	277	276	294
Receptor Height (m)[(4)]		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Urban/Rural		Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Building Height (m)		2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Min Horizontal Bldg Dim (m)		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Max Horizontal Bldg Dim (m)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Consider Bldg Downwash?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Meteorology		Full	Full	Full	Full	Full	Full	Full	Full
Automated Distances Array		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Terrain Height Above Stack Base		0	0	0	0	0	0	0	0
SCREEN3 Model Output									
1-HR Max Concentration at Receptor Height ($\mu g/m^3$)[(5)]		1326	1306	1330	1265	1321	1337	1201	1332
Annualization Factor[(6)]		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[(7)]		106.1	104.5	106.4	101.2	105.7	107	96.1	106.6
Distance To Max Concentration (m)[(8)]		44	45	44	45	44	44	46	44

Notes and abbreviations on last page.

Table B-1. Summary of SCREEN3 Model Input and Outputs, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Parameters	Date Sampled:	09/19/11	12/05/11	03/09/12	06/04/12	09/17/12	12/20/12	03/28/13	06/19/13
SCREEN3 Model Input									
Source Type		Point	Point	Point	Point	Point	Point	Point	Point
Emission Rate (g/s)		1	1	1	1	1	1	1	1
Stack Height (m)		10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Stack Inside Diameter (m)		0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Air Flow Rate (scfm)[(1)]		572	590	627	523	494	647	519	515
Air Flow Rate (acfm @ stack temp)[(2)]		596	601	655	552	540	684	533	548
Stack Gas Exit Temperature (K)[(1)]		306	300	308	311	322	311	303	313
Ambient Air Temperature (K)[(3)]		291	277	276	294	293	274	279	292
Receptor Height (m)[(4)]		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Urban/Rural		Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Building Height (m)		2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Min Horizontal Bldg Dim (m)		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Max Horizontal Bldg Dim (m)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Consider Bldg Downwash?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base		Simple	Simple	Simple	Simple	Simple	Simple	Simple	Simple
Meteorology		Full	Full	Full	Full	Full	Full	Full	Full
Automated Distances Array		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Terrain Height Above Stack Base		0	0	0	0	0	0	0	0
SCREEN3 Model Output									
1-HR Max Concentration at Receptor Height ($\mu g/m^3$)[(5)]		1346	1298	1123	1388	1275	1040	1345	1402
Annualization Factor[(6)]		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[(7)]		107.7	103.8	89.8	111	102	83.2	107.6	112.2
Distance To Max Concentration (m)[(8)]		44	45	48	43	45	50	44	43

Notes and abbreviations on last page.

Table B-1. Summary of SCREEN3 Model Input and Outputs, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Parameters	Date Sampled:	09/05/13	12/04/13	03/11/14	06/20/14	09/10/14	12/10/14
SCREEN3 Model Input							
Source Type		Point	Point	Point	Point	Point	Point
Emission Rate (g/s)		1	1	1	1	1	1
Stack Height (m)		10.1	10.1	10.1	10.1	10.1	10.1
Stack Inside Diameter (m)		0.41	0.41	0.41	0.41	0.41	0.41
Air Flow Rate (scfm)[1]		683 [9]	720 [11]	665	734	683	650
Air Flow Rate (acfm @ stack temp)[2]		741	760	695	781	716	655
Stack Gas Exit Temperature (K)[1]		319 [10]	311	308	313	309	296
Ambient Air Temperature (K)[3]		288	277	276	294	293	276
Receptor Height (m)[4]		1.5	1.5	1.5	1.5	1.5	1.5
Urban/Rural		Urban	Urban	Urban	Urban	Urban	Urban
Building Height (m)		2.4	2.4	2.4	2.4	2.4	2.4
Min Horizontal Bldg Dim (m)		4.9	4.9	4.9	4.9	4.9	4.9
Max Horizontal Bldg Dim (m)		5.0	5.0	5.0	5.0	5.0	5.0
Consider Bldg Downwash?		Yes	Yes	Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack		Simple	Simple	Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base		Simple	Simple	Simple	Simple	Simple	Simple
Meteorology		Full	Full	Full	Full	Full	Full
Automated Distances Array		Yes	Yes	Yes	Yes	Yes	Yes
Terrain Height Above Stack Base		0	0	0	0	0	0
SCREEN3 Model Output							
1-HR Max Concentration at Receptor Height ($\mu g/m^3$)[5]		1104	1036	1103	1188	1240	1292
Annualization Factor[6]		0.08	0.08	0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[7]		88.3	82.9	88.2	95	99.2	103.4
Distance To Max Concentration (m)[8]		49	50	49	47	46	45

Notes and abbreviations on last page.

Table B-1. Summary of SCREEN3 Model Input and Outputs, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Notes and Abbreviations:

acfm	actual cubic feet per minute
ft	feet
g/s	grams per second
°K	degrees Kelvin
m	meter
scfm	standard cubic feet per minute
µg/m^3	micrograms per cubic meter
USEPA	U.S. Environmental Protection Agency

1. The stack air flow rate (in scfm) and exit temperature were measured using a handheld thermo-anemometer. Values were measured at the stack effluent location.
2. The stack air flow rate at the stack temperature (in acfm) was calculated by dividing the stack air flow rate in scfm by the ratio of the standard temperature to the actual stack gas exit temperature.
3. The ambient temperature was recorded from the weather.newday.com website for Islip, New York. The mean actual temperature from the website was used in model calculation.
4. The receptor height corresponds to the average inhalation level.
5. SCREEN3 calculated constituent concentration at listed conditions at the specified inhalation level.
6. A USEPA time averaging conversion factor of 0.08 was used to convert the 1-hour maximum concentration output to an annual average.
7. Average annual constituent concentration at the receptor height was calculated by multiplying the one hour maximum concentration by the annualization factor.
8. SCREEN3 calculated distance to the 1-hour maximum concentration.
9. The effluent air flow rate was remeasured on October 2, 2013 due to an erroneous value recorded on September 5, 2013.
10. As of September 5, 2013 the stack gas exit temperature was measured at the heat exchanger effluent location.
11. The effluent air flow rate was remeasured on December 6, 2013 due to an erroneous value recorded on December 4, 2013.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Actual Effluent Concentrations[(1)] (µg/m^3)								
	02/18/08	02/19/08	02/25/08	03/03/08	03/17/08	04/16/08	05/19/08	06/02/08	07/07/08
1,1,1-Trichloroethane	0	0	0	0	0	0	0	0	0
1,1-Dichloroethane	0	0	0	0	0	0	5.8	7.6	11
1,1-Dichloroethene	0	0	0	0	0	0	0	0	0
1,2-Dichloroethane	0	0	0	0	0	0	0	0	0
1-Chloro-1,1-difluoroethane (Freon 142b)	--	--	--	--	--	--	--	--	--
2-Butanone	0	0	0	0	0	0	0	0	0
2-Hexanone	0	0	0	0	0	0	0	0	0
Acetone	0	0	0	0	0	0	0	8.4	0
Benzene	0	0	0	0	0	0	0	0	0
Bromodichloromethane	0	0	0	0	0	0	0	0	0
Bromoform	0	0	0	0	0	0	0	0	0
Carbon disulfide	0	0	0	0	0	0	0	0	0
Carbon tetrachloride	0	0	0	0	0	0	0	0	0
Chlorodibromomethane	0	0	0	0	0	0	0	0	0
Chlorodifluoromethane (Freon 22)	--	--	--	--	--	--	--	--	--
Chloroform	0	0	0	0	0	0	0	3	8.4
cis-1,2-Dichloroethene	0	0	0	0	0	79	180	230	350
Dichlorodifluoromethane (Freon 12)	0	0.71	5.7	8.3	0	0	0	0	0
Methylene Chloride	0	0	0	0	0	0	0	0	0
Tetrachloroethene	0	0	0	0	0	0	0	2.2	0
Toluene	0	0	0	0	0	0	0	0	0
trans-1,2-Dichloroethene	0	0	0	0	0	0	0	2.8	0
Trichloroethylene	0	0	0	0	0	0	5.3	6.5	7.7
Trichlorofluoromethane (Freon 11)	0	0	0	0	0	0	0	0	0
Trichlorotrifluoroethane (Freon 113)	0	0	0	0	0	0	0	0	0
Vinyl chloride	0	0	1.1	40	920	710	65	13	5.9
Xylenes - M,P	0	0	0	0	0	0	0	0	0

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Actual Effluent Concentrations[(1)] (µg/m^3)								
	08/06/08	9/24/2008	10/27/2008	11/25/2008	12/18/2008	3/19/2009	6/26/2009	9/29/2009	12/2/2009
1,1,1-Trichloroethane	0	9.7	0	23	0	57	24	26	22
1,1-Dichloroethane	9.2	26	30	32	29	30	17	19	16
1,1-Dichloroethene	0	3.5	0	0	0	0	3.9	3.9	3.8
1,2-Dichloroethane	0	0	0	0	0	0	0	0	0
1-Chloro-1,1-difluoroethane (Freon 142b)	--	--	--	--	--	--	820	680	350
2-Butanone	0	0	0	0	0	0	6.4	2	3.7
2-Hexanone	0	0	0	0	0	0	0	0	0
Acetone	0	0	0	0	0	0	25	0	0
Benzene	0	0	0	0	0	15	120	14	140
Bromodichloromethane	0	0	0	0	0	0	0	0	0
Bromoform	0	0	0	0	0	0	0	0	0
Carbon disulfide	0	0	0	0	0	0	0	1.7	0
Carbon tetrachloride	0	0	0	0	0	0	0	0	0
Chlorodibromomethane	0	0	0	0	0	0	0	0	0
Chlorodifluoromethane (Freon 22)	--	--	--	--	--	--	260	660	430
Chloroform	8.2	35	45	53	42	30	18	110	80
cis-1,2-Dichloroethene	320	620	830	770	730	1400	960	900	600
Dichlorodifluoromethane (Freon 12)	0	0	0	69	0	0	10	5.7	4.4
Methylene Chloride	0	0	0	0	0	0	0	0	0
Tetrachloroethene	0	0.88	0	0	0	24	22	31	19
Toluene	0	0	0	0	0	11	0	0	2.2
trans-1,2-Dichloroethene	3.6	8.6	0	0	0	0	9.4	10	6.2
Trichloroethylene	9.2	120	120	310	130	920	720	1000	750
Trichlorofluoromethane (Freon 11)	5.5	11	0	0	0	0	4	3.3	2.6
Trichlorotrifluoroethane (Freon 113)	0	0	0	0	0	0	0	0	0
Vinyl chloride	4.9	4.9	0	0	0	0	1.7	0	1.8
Xylenes - M,P	0	0	0	0	0	0	0	0	0

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Actual Effluent Concentrations[1] (µg/m^3)								
	3/12/2010	6/7/2010	8/30/2010	1/5/2011[6]	3/7/2011	6/8/2011	9/19/2011	12/5/2011	3/9/2012
1,1,1-Trichloroethane	18	1	22	17	17	11	17	11	7.3
1,1-Dichloroethane	14	10	17	16	13	11	14	11	7.7
1,1-Dichloroethene	5.2	4	0	5.5	4.9	5.7	4.3	3.3	0
1,2-Dichloroethane	0	24	0	0	0	0	0	0	0
1-Chloro-1,1-difluoroethane (Freon 142b)	340	690	670	170	210	560	360	150	270
2-Butanone	0	0	0	0	0	0	0	0	0
2-Hexanone	0	2.9	0	0	0	0	0	0	0
Acetone	0	0	0	0	0	14	0	0	0
Benzene	57	0	0	0	0	0	0	2.5	0
Bromodichloromethane	0	0	0	0	0	0	0	1.1	0
Bromoform	0	0	0	0	0	0	0	0	0
Carbon disulfide	0	0	0	0	0	0	0	0	0
Carbon tetrachloride	0.77	0	0	0	0	0	0	0	0
Chlorodibromomethane	0	0	0	0	0	0	0	0	0
Chlorodifluoromethane (Freon 22)	300	120	150	91	95	24	25	17	13
Chloroform	16	14	110	63	40	23	98	83	11
cis-1,2-Dichloroethene	570	770	850	590	680	620	580	540	460
Dichlorodifluoromethane (Freon 12)	4.3	0	0	3	0	3.2	5.3	2.6	0
Methylene Chloride	0	0	0	0	0	0	0	0	0
Tetrachloroethene	15	28	43	17	15	21	25	15	11
Toluene	1.3	0	0	0	0	0	0	1.8	0
trans-1,2-Dichloroethene	8	5	10	5.5	0	4.8	6.5	3.8	0
Trichloroethylene	540	730	1100	630	670	590	680	560	440
Trichlorofluoromethane (Freon 11)	2.7	0	0	2.4	0	1.7	1.9	1.4	0
Trichlorotrifluoroethane (Freon 113)	0.73	0	0	0	0	0	0	0	0
Vinyl chloride	2.1	0	0	1.7	0	1.3	1.7	1.6	0
Xylenes - M,P	0	0	0	0	0	0	0	1.6	0

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Actual Effluent Concentrations[(1)] (µg/m^3)								
	6/4/2012	9/17/2012	12/20/2012	3/28/2013	6/19/2013	9/5/2013	12/4/2013	3/11/2014	6/20/2014
1,1,1-Trichloroethane	8.8	14	13	8.4	11	14	13	7.6	7.3
1,1-Dichloroethane	7.0	12	13	9.4	7.9	11	11	6.9	6.2
1,1-Dichloroethene	1.7	2.0	2.7	3.0	2.4	2.1	1.6	0	1.4
1,2-Dichloroethane	0	0	0	0	0	0	0	0	0
1-Chloro-1,1-difluoroethane (Freon 142b)	240	380	140	160	230	380	170	150	260
2-Butanone	0	0	0	0	0	0	0	0	0
2-Hexanone	0	0	0	0	0	0	0	0	0
Acetone	11	0	0	0	0	0	0	0	7.1
Benzene	3.5	28	12	1.5	2.6	15	0	18	0
Bromodichloromethane	1.2	0	0	0	0	1.2	0	0	0
Bromoform	1.3	0	0	0	0	0	0	0	0
Carbon disulfide	0	0	0	0	0	0	0	0	0
Carbon tetrachloride	0	1.1	0	0	0.78	0.96	0	0	0
Chlorodibromomethane	0.95	0	0	0	0	0	0	0	0
Chlorodifluoromethane (Freon 22)	8.6	6.1	5.5	4.1	4.2	7.0	3.0	2.8	1.2
Chloroform	13	81	120	18	14	17	38	8.0	9.8
cis-1,2-Dichloroethene	410	440	460	430	470	490	500	320	410
Dichlorodifluoromethane (Freon 12)	2.2	3.8	2.9	2.4	2.5	3.3	2.5	2.2	2.1
Methylene Chloride	0	0	0	0	0	0	0	0	0
Tetrachloroethene	20	26	17	1.4	17	26	14	7.9	13
Toluene	0	0	0	0	0	0	0	0	0.75
trans-1,2-Dichloroethene	3.2	5.3	4.3	2.6	2.9	4.8	3.3	0	2.5
Trichloroethylene	460	600	530	260	470	620	570	300	390
Trichlorofluoromethane (Freon 11)	2.3	2.3	1.6	1.5	2.1	1.8	1.3	0	1.2
Trichlorotrifluoroethane (Freon 113)	0	0	0	0	0	0	0	0	0
Vinyl chloride	0	0	0.95	1.6	0.97	0.85	0.92	0	0.99
Xylenes - M,P	0	0	0	0	0	0	0	0	0

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Actual Effluent Concentrations[1] (µg/m^3)	
	9/10/2014	12/10/2014
1,1,1-Trichloroethane	6.3	15
1,1-Dichloroethane	5.4	14
1,1-Dichloroethene	0.77	1.70
1,2-Dichloroethane	0	0
1-Chloro-1,1-difluoroethane (Freon 142b)	150	120
2-Butanone	0	0
2-Hexanone	0.86	0
Acetone	15	1.7
Benzene	2.7	2.7
Bromodichloromethane	0	0
Bromoform	0	0
Carbon disulfide	0	0
Carbon tetrachloride	0	0.69
Chlorodibromomethane	0	0
Chlorodifluoromethane (Freon 22)	1.1	3.9
Chloroform	7.7	14.0
cis-1,2-Dichloroethene	190	519
Dichlorodifluoromethane (Freon 12)	2.1	3.1
Methylene Chloride	0	0.76
Tetrachloroethene	14	15
Toluene	0	0
trans-1,2-Dichloroethene	2.5	3.8
Trichloroethylene	320	570
Trichlorofluoromethane (Freon 11)	1.6	1.6
Trichlorotrifluoroethane (Freon 113)	0	0
Vinyl chloride	0	1.3
Xylenes - M,P	0	0

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	AGC[(2)] ($\mu g/m^3$)	02/18/08	02/19/08	02/25/08	03/03/08	03/17/08	04/16/08	05/19/08	06/02/08	07/07/08
1,1,1-Trichloroethane	5,000	2.17E+07	2.21E+07	2.36E+07	2.27E+07	2.27E+07	3.13E+07	3.09E+07	2.88E+07	2.73E+07
1,1-Dichloroethane	0.63	1.37E+04	1.39E+04	1.49E+04	1.43E+04	1.43E+04	1.97E+04	1.95E+04	1.82E+04	1.72E+04
1,1-Dichloroethene	200	1.52E+06	1.55E+06	1.65E+06	1.59E+06	1.59E+06	2.19E+06	2.16E+06	2.02E+06	1.91E+06
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	1.08E+09	1.10E+09	1.18E+09	1.14E+09	1.14E+09	1.56E+09	1.54E+09	1.44E+09	1.36E+09
2-Butanone	5,000	1.08E+08	1.10E+08	1.18E+08	1.14E+08	1.14E+08	1.56E+08	1.54E+08	1.44E+08	1.36E+08
2-Hexanone	30	6.51E+05	6.62E+05	7.09E+05	6.81E+05	6.81E+05	9.39E+05	9.27E+05	8.64E+05	8.19E+05
Acetone	30,000	6.07E+08	6.18E+08	6.62E+08	6.36E+08	6.36E+08	8.76E+08	8.65E+08	8.07E+08	7.64E+08
Benzene	0.13	2.82E+03	2.87E+03	3.07E+03	2.95E+03	2.95E+03	4.07E+03	4.02E+03	3.75E+03	3.55E+03
Bromodichloromethane	70	1.52E+06	1.55E+06	1.65E+06	1.59E+06	1.59E+06	2.19E+06	2.16E+06	2.02E+06	1.91E+06
Bromoform	0.91	1.97E+04	2.01E+04	2.15E+04	2.07E+04	2.07E+04	2.85E+04	2.81E+04	2.62E+04	2.48E+04
Carbon disulfide	700	1.52E+07	1.55E+07	1.65E+07	1.59E+07	1.59E+07	2.19E+07	2.16E+07	2.02E+07	1.91E+07
Carbon tetrachloride	0.17	1.45E+03	1.48E+03	1.58E+03	1.52E+03	1.52E+03	2.10E+03	2.07E+03	1.93E+03	1.83E+03
Chlorodibromomethane	NS	2.17E+03	2.21E+03	2.36E+03	2.27E+03	2.27E+03	3.13E+03	3.09E+03	2.88E+03	2.73E+03
Chlorodifluoromethane (Freon 22)	50,000	1.08E+09	1.10E+09	1.18E+09	1.14E+09	1.14E+09	1.56E+09	1.54E+09	1.44E+09	1.36E+09
Chloroform	14.7	9.33E+02	9.49E+02	1.02E+03	9.77E+02	9.76E+02	1.35E+03	1.33E+03	1.24E+03	1.17E+03
cis-1,2-Dichloroethene	63	1.37E+06	1.39E+06	1.49E+06	1.43E+06	1.43E+06	1.97E+06	1.95E+06	1.82E+06	1.72E+06
Dichlorodifluoromethane (Freon 12)	12,000	2.60E+08	2.65E+08	2.84E+08	2.73E+08	2.72E+08	3.75E+08	3.71E+08	3.46E+08	3.27E+08
Methylene Chloride	60	1.30E+06	1.32E+06	1.42E+06	1.36E+06	1.36E+06	1.88E+06	1.85E+06	1.73E+06	1.64E+06
Tetrachloroethene	4.0	2.17E+04	2.21E+04	2.36E+04	2.27E+04	2.27E+04	3.13E+04	3.09E+04	2.88E+04	2.73E+04
Toluene	5,000	1.08E+08	1.10E+08	1.18E+08	1.14E+08	1.14E+08	1.56E+08	1.54E+08	1.44E+08	1.36E+08
trans-1,2-Dichloroethene	63	1.37E+06	1.39E+06	1.49E+06	1.43E+06	1.43E+06	1.97E+06	1.95E+06	1.82E+06	1.72E+06
Trichloroethylene	0.2	1.08E+04	1.10E+04	1.18E+04	1.14E+04	1.14E+04	1.56E+04	1.54E+04	1.44E+04	1.36E+04
Trichlorofluoromethane (Freon 11)	5,000	2.17E+07	2.21E+07	2.36E+07	2.27E+07	2.27E+07	3.13E+07	3.09E+07	2.88E+07	2.73E+07
Trichlorotrifluoroethane (Freon 113)	180,000	3.90E+09	3.97E+09	4.26E+09	4.09E+09	4.09E+09	5.63E+09	5.56E+09	5.19E+09	4.91E+09
Vinyl chloride	0.068	2.39E+03	2.43E+03	2.60E+03	2.50E+03	2.50E+03	3.44E+03	3.40E+03	3.17E+03	3.00E+03
Xylenes - M,P	100	2.17E+06	2.21E+06	2.36E+06	2.27E+06	2.27E+06	3.13E+06	3.09E+06	2.88E+06	2.73E+06

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

		08/06/08	9/24/2008	10/27/2008	11/25/2008	12/18/2008	3/19/2009	6/26/2009	9/29/2009	12/2/2009
1,1,1-Trichloroethane	5,000	3.09E+07	3.09E+07	3.40E+07	3.74E+07	3.55E+07	3.72E+07	3.31E+07	3.24E+07	3.17E+07
1,1-Dichloroethane	0.63	1.95E+04	1.95E+04	2.14E+04	2.36E+04	2.24E+04	2.34E+04	2.08E+04	2.04E+04	2.00E+04
1,1-Dichloroethene	200	2.16E+06	2.17E+06	2.38E+06	2.62E+06	2.49E+06	2.60E+06	2.32E+06	2.27E+06	2.22E+06
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	1.55E+09	1.55E+09	1.70E+09	1.87E+09	1.78E+09	1.86E+09	1.65E+09	1.62E+09	1.59E+09
2-Butanone	5,000	1.55E+08	1.55E+08	1.70E+08	1.87E+08	1.78E+08	1.86E+08	1.65E+08	1.62E+08	1.59E+08
2-Hexanone	30	9.27E+05	9.28E+05	1.02E+06	1.12E+06	1.07E+06	1.11E+06	9.93E+05	9.71E+05	9.52E+05
Acetone	30,000	8.66E+08	8.66E+08	9.53E+08	1.05E+09	9.94E+08	1.04E+09	9.27E+08	9.06E+08	8.88E+08
Benzene	0.13	4.02E+03	4.02E+03	4.42E+03	4.86E+03	4.62E+03	4.83E+03	4.30E+03	4.21E+03	4.13E+03
Bromodichloromethane	70	2.16E+06	2.17E+06	2.38E+06	2.62E+06	2.49E+06	2.60E+06	2.32E+06	2.27E+06	2.22E+06
Bromoform	0.91	2.81E+04	2.82E+04	3.10E+04	3.40E+04	3.23E+04	3.38E+04	3.01E+04	2.95E+04	2.89E+04
Carbon disulfide	700	2.16E+07	2.17E+07	2.38E+07	2.62E+07	2.49E+07	2.60E+07	2.32E+07	2.27E+07	2.22E+07
Carbon tetrachloride	0.17	2.07E+03	2.07E+03	2.28E+03	2.51E+03	2.38E+03	2.49E+03	2.22E+03	2.17E+03	2.13E+03
Chlorodibromomethane	NS	3.09E+03	3.09E+03	3.40E+03	3.74E+03	3.55E+03	3.72E+03	3.31E+03	3.24E+03	3.17E+03
Chlorodifluoromethane (Freon 22)	50,000	1.55E+09	1.55E+09	1.70E+09	1.87E+09	1.78E+09	1.86E+09	1.65E+09	1.62E+09	1.59E+09
Chloroform	14.7	1.33E+03	1.33E+03	1.46E+03	1.61E+03	1.53E+03	1.60E+03	1.42E+03	1.39E+03	1.36E+03
cis-1,2-Dichloroethene	63	1.95E+06	1.95E+06	2.14E+06	2.36E+06	2.24E+06	2.34E+06	2.08E+06	2.04E+06	2.00E+06
Dichlorodifluoromethane (Freon 12)	12,000	3.71E+08	3.71E+08	4.08E+08	4.49E+08	4.26E+08	4.46E+08	3.97E+08	3.88E+08	3.81E+08
Methylene Chloride	60	1.85E+06	1.86E+06	2.04E+06	2.24E+06	2.13E+06	2.23E+06	1.99E+06	1.94E+06	1.90E+06
Tetrachloroethene	4.0	3.09E+04	3.09E+04	3.40E+04	3.74E+04	3.55E+04	3.72E+04	3.31E+04	3.24E+04	3.17E+04
Toluene	5,000	1.55E+08	1.55E+08	1.70E+08	1.87E+08	1.78E+08	1.86E+08	1.65E+08	1.62E+08	1.59E+08
trans-1,2-Dichloroethene	63	1.95E+06	1.95E+06	2.14E+06	2.36E+06	2.24E+06	2.34E+06	2.08E+06	2.04E+06	2.00E+06
Trichloroethylene	0.2	1.55E+04	1.55E+04	1.70E+04	1.87E+04	1.78E+04	1.86E+04	1.65E+04	1.62E+04	1.59E+04
Trichlorofluoromethane (Freon 11)	5,000	3.09E+07	3.09E+07	3.40E+07	3.74E+07	3.55E+07	3.72E+07	3.31E+07	3.24E+07	3.17E+07
Trichlorotrifluoroethane (Freon 113)	180,000	5.56E+09	5.57E+09	6.13E+09	6.73E+09	6.39E+09	6.69E+09	5.96E+09	5.83E+09	5.71E+09
Vinyl chloride	0.068	3.40E+03	3.40E+03	3.74E+03	4.12E+03	3.91E+03	4.09E+03	3.64E+03	3.56E+03	3.49E+03
Xylenes - M,P	100	3.09E+06	3.09E+06	3.40E+06	3.74E+06	3.55E+06	3.72E+06	3.31E+06	3.24E+06	3.17E+06

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Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

		Annual MASC[3][5] ($\mu g/m^3$)								
		3/12/2010	6/7/2010	8/30/2010	1/5/2011[6]	3/7/2011	6/8/2011	9/19/2011	12/5/2011	3/9/2012
1,1,1-Trichloroethane	5,000	3.25E+07	3.00E+07	3.22E+07	1.63E+08	1.44E+08	1.63E+08	1.65E+08	1.70E+08	1.80E+08
1,1-Dichloroethane	0.63	2.05E+04	1.89E+04	2.03E+04	2.06E+04	1.82E+04	2.05E+04	2.08E+04	2.14E+04	2.27E+04
1,1-Dichloroethene	200	2.27E+06	2.10E+06	2.25E+06	2.29E+06	2.02E+06	2.28E+06	2.31E+06	2.38E+06	2.52E+06
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	1.62E+09	1.50E+09	1.61E+09	1.63E+09	1.44E+09	1.63E+09	1.65E+09	1.70E+09	1.80E+09
2-Butanone	5,000	1.62E+08	1.50E+08	1.61E+08	1.63E+08	1.44E+08	1.63E+08	1.65E+08	1.70E+08	1.80E+08
2-Hexanone	30	9.75E+05	9.01E+05	9.65E+05	9.80E+05	8.66E+05	9.76E+05	9.90E+05	1.02E+06	1.08E+06
Acetone	30,000	9.10E+08	8.41E+08	9.01E+08	9.80E+08	8.66E+08	9.76E+08	9.90E+08	1.02E+09	1.08E+09
Benzene	0.13	4.22E+03	3.91E+03	4.18E+03	4.25E+03	3.75E+03	4.23E+03	4.29E+03	4.42E+03	4.68E+03
Bromodichloromethane	70	2.27E+06	2.10E+06	2.25E+06	2.29E+06	2.02E+06	2.28E+06	2.31E+06	2.38E+06	2.52E+06
Bromoform	0.91	2.96E+04	2.73E+04	2.93E+04	2.97E+04	2.63E+04	2.96E+04	3.00E+04	3.09E+04	3.28E+04
Carbon disulfide	700	2.27E+07	2.10E+07	2.25E+07	2.29E+07	2.02E+07	2.28E+07	2.31E+07	2.38E+07	2.52E+07
Carbon tetrachloride	0.17	2.18E+03	2.01E+03	2.16E+03	2.19E+03	1.93E+03	2.18E+03	2.21E+03	2.28E+03	2.41E+03
Chlorodibromomethane	NS	3.25E+03	3.00E+03	3.22E+03	3.27E+03	2.89E+03	3.25E+03	3.30E+03	3.40E+03	3.60E+03
Chlorodifluoromethane (Freon 22)	50,000	1.62E+09	1.50E+09	1.61E+09	1.63E+09	1.44E+09	1.63E+09	1.65E+09	1.70E+09	1.80E+09
Chloroform	14.7	1.40E+03	1.29E+03	1.38E+03	1.41E+03	1.24E+03	1.40E+03	1.42E+03	1.46E+03	1.55E+03
cis-1,2-Dichloroethene	63	2.05E+06	1.89E+06	2.03E+06	2.06E+06	1.82E+06	2.05E+06	2.08E+06	2.14E+06	2.27E+06
Dichlorodifluoromethane (Freon 12)	12,000	3.90E+08	3.60E+08	3.86E+08	3.92E+08	3.46E+08	3.90E+08	3.96E+08	4.08E+08	4.32E+08
Methylene Chloride	60	1.95E+06	1.80E+06	1.93E+06	1.96E+06	1.73E+06	1.95E+06	1.98E+06	2.04E+06	2.16E+06
Tetrachloroethene	4.0	3.25E+04	3.00E+04	3.22E+04	3.27E+04	2.89E+04	3.25E+04	3.30E+04	3.40E+04	3.60E+04
Toluene	5,000	1.62E+08	1.50E+08	1.61E+08	1.63E+08	1.44E+08	1.63E+08	1.65E+08	1.70E+08	1.80E+08
trans-1,2-Dichloroethene	63	2.05E+06	1.89E+06	2.03E+06	2.06E+06	1.82E+06	2.05E+06	2.08E+06	2.14E+06	2.27E+06
Trichloroethylene	0.2	1.62E+04	1.50E+04	1.61E+04	1.63E+04	1.44E+04	1.63E+04	1.65E+04	1.70E+04	1.80E+04
Trichlorofluoromethane (Freon 11)	5,000	3.25E+07	3.00E+07	3.22E+07	1.63E+08	1.44E+08	1.63E+08	1.65E+08	1.70E+08	1.80E+08
Trichlorotrifluoroethane (Freon 113)	180,000	5.85E+09	5.41E+09	5.79E+09	5.88E+09	5.19E+09	5.86E+09	5.94E+09	6.11E+09	6.48E+09
Vinyl chloride	0.068	3.57E+03	3.30E+03	3.54E+03	3.59E+03	3.17E+03	3.58E+03	3.63E+03	3.74E+03	3.96E+03
Xylenes - M,P	100	3.25E+06	3.00E+06	3.22E+06	3.27E+06	2.89E+06	3.25E+06	3.30E+06	3.40E+06	3.60E+06

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

		6/4/2012	9/17/2012	12/20/2012	3/28/2013	6/19/2013	9/5/2013	12/4/2013	3/11/2014	6/20/2014
1,1,1-Trichloroethane	5,000	1.73E+08	1.92E+08	1.86E+08	1.85E+08	1.72E+08	1.6E+08	1.7E+08	1.7E+08	1.4E+08
1,1-Dichloroethane	0.63	2.18E+04	2.42E+04	2.35E+04	2.33E+04	2.17E+04	2.0E+04	2.1E+04	2.2E+04	1.8E+04
1,1-Dichloroethene	200	2.42E+06	2.69E+06	2.61E+06	7.39E+06	6.89E+06	6.5E+06	6.7E+06	6.9E+06	5.7E+06
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	1.73E+09	1.92E+09	1.86E+09	1.85E+09	1.72E+09	1.6E+09	1.7E+09	1.7E+09	1.4E+09
2-Butanone	5,000	1.73E+08	1.92E+08	1.86E+08	1.85E+08	1.72E+08	1.6E+08	1.7E+08	1.7E+08	1.4E+08
2-Hexanone	30	1.04E+06	1.15E+06	1.12E+06	1.11E+06	1.03E+06	9.7E+05	1.0E+06	1.0E+06	8.6E+05
Acetone	30,000	1.04E+09	1.15E+09	1.12E+09	1.11E+09	1.03E+09	9.7E+08	1.0E+09	1.0E+09	8.6E+08
Benzene	0.13	4.50E+03	5.00E+03	4.84E+03	4.80E+03	4.48E+03	4.2E+03	4.4E+03	4.5E+03	3.7E+03
Bromodichloromethane	70	2.42E+06	2.69E+06	2.61E+06	2.59E+06	2.41E+06	2.3E+06	2.4E+06	2.4E+06	2.0E+06
Bromoform	0.91	3.15E+04	3.50E+04	3.39E+04	3.36E+04	3.14E+04	2.9E+04	3.1E+04	3.1E+04	2.6E+04
Carbon disulfide	700	2.42E+07	2.69E+07	2.61E+07	2.59E+07	2.41E+07	2.3E+07	2.4E+07	2.4E+07	2.0E+07
Carbon tetrachloride	0.17	2.32E+03	2.58E+03	2.49E+03	6.28E+03	5.86E+03	5.5E+03	5.7E+03	5.9E+03	4.9E+03
Chlorodibromomethane	NS	3.46E+03	3.85E+03	3.72E+03	--	--	--	--	--	--
Chlorodifluoromethane (Freon 22)	50,000	1.73E+09	1.92E+09	1.86E+09	1.85E+09	1.72E+09	1.6E+09	1.7E+09	1.7E+09	1.4E+09
Chloroform	14.7	1.49E+03	1.65E+03	1.60E+03	5.43E+05	5.07E+05	4.8E+05	4.9E+05	5.1E+05	4.2E+05
cis-1,2-Dichloroethene	63	2.18E+06	2.42E+06	2.35E+06	2.33E+06	2.17E+06	2.0E+06	2.1E+06	2.2E+06	1.8E+06
Dichlorodifluoromethane (Freon 12)	12,000	4.15E+08	4.62E+08	4.47E+08	4.43E+08	4.14E+08	3.9E+08	4.0E+08	4.1E+08	3.4E+08
Methylene Chloride	60	2.07E+06	2.31E+06	2.23E+06	2.22E+06	2.07E+06	1.9E+06	2.0E+06	2.1E+06	1.7E+06
Tetrachloroethene	4.0	3.46E+04	3.85E+04	3.72E+04	1.48E+05	1.38E+05	1.3E+05	1.3E+05	1.4E+05	1.1E+05
Toluene	5,000	1.73E+08	1.92E+08	1.86E+08	1.85E+08	1.72E+08	1.6E+08	1.7E+08	1.7E+08	1.4E+08
trans-1,2-Dichloroethene	63	2.18E+06	2.42E+06	2.35E+06	2.33E+06	2.17E+06	2.0E+06	2.1E+06	2.2E+06	1.8E+06
Trichloroethylene	0.2	1.73E+04	1.92E+04	1.86E+04	7.39E+03	6.89E+03	6.5E+03	6.7E+03	6.9E+03	5.7E+03
Trichlorofluoromethane (Freon 11)	5,000	1.73E+08	1.92E+08	1.86E+08	1.85E+08	1.72E+08	1.6E+08	1.7E+08	1.7E+08	1.4E+08
Trichlorotrifluoroethane (Freon 113)	180,000	6.22E+09	6.92E+09	6.70E+09	6.65E+09	6.20E+09	5.8E+09	6.1E+09	6.2E+09	5.1E+09
Vinyl chloride	0.068	3.80E+03	4.23E+03	4.10E+03	2.51E+03	2.34E+03	2.2E+03	2.3E+03	2.4E+03	1.9E+03
Xylenes - M,P	100	3.46E+06	3.85E+06	3.72E+06	3.69E+06	3.45E+06	3.2E+06	3.4E+06	3.5E+06	2.9E+06

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

		9/10/2014	12/10/2014
1,1,1-Trichloroethane	5,000	1.5E+08	1.6E+08
1,1-Dichloroethane	0.63	1.9E+04	2.0E+04
1,1-Dichloroethene	200	6.0E+06	6.3E+06
1-Chloro-1,1-difluoroethane (Freon 142b)	50,000	1.5E+09	1.6E+09
2-Butanone	5,000	1.5E+08	1.6E+08
2-Hexanone	30	8.9E+05	9.4E+05
Acetone	30,000	8.9E+08	9.4E+08
Benzene	0.13	3.9E+03	4.1E+03
Bromodichloromethane	70	2.1E+06	2.2E+06
Bromoform	0.91	2.7E+04	2.8E+04
Carbon disulfide	700	2.1E+07	2.2E+07
Carbon tetrachloride	0.17	5.1E+03	5.3E+03
Chlorodibromomethane	NS	--	--
Chlorodifluoromethane (Freon 22)	50,000	1.5E+09	1.6E+09
Chloroform	14.7	4.4E+05	4.6E+05
cis-1,2-Dichloroethene	63	1.9E+06	2.0E+06
Dichlorodifluoromethane (Freon 12)	12,000	3.6E+08	3.8E+08
Methylene Chloride	60	1.8E+06	1.9E+06
Tetrachloroethene	4.0	1.2E+05	1.3E+05
Toluene	5,000	1.5E+08	1.6E+08
trans-1,2-Dichloroethene	63	1.9E+06	2.0E+06
Trichloroethylene	0.2	6.0E+03	6.3E+03
Trichlorofluoromethane (Freon 11)	5,000	1.5E+08	1.6E+08
Trichlorotrifluoroethane (Freon 113)	180,000	5.4E+09	5.6E+09
Vinyl chloride	0.068	2.0E+03	2.1E+03
Xylenes - M,P	100	3.0E+06	3.1E+06

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Percent of Annual MASC[4][5]								
	02/18/08	02/19/08	02/25/08	03/03/08	03/17/08	04/16/08	05/19/08	06/02/08	07/07/08
1,1,1-Trichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.030%	0.042%	0.064%
1,1-Dichloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)[5]	--	--	--	--	--	--	--	--	--
2-Butanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromodichloromethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon disulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon tetrachloride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodibromomethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodifluoromethane (Freon 22)[5]	--	--	--	--	--	--	--	--	--
Chloroform	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.24%	0.72%
cis-1,2-Dichloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0040%	0.0092%	0.013%	0.020%
Dichlorodifluoromethane (Freon 12)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0076%	0.0%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0002%	0.0%
Trichloroethylene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.034%	0.045%	0.056%
Trichlorofluoromethane (Freon 11)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.0%	0.0%	0.042%	1.6%	37%	21%	1.9%	0.41%	0.20%
Xylenes - M,P	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Percent of Annual MASC[4][5]								
	08/06/08	9/24/2008	10/27/2008	11/25/2008	12/18/2008	3/19/2009	6/26/2009	9/29/2009	12/2/2009
1,1,1-Trichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.047%	0.13%	0.14%	0.14%	0.13%	0.13%	0.082%	0.093%	0.080%
1,1-Dichloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)[5]	--	--	--	--	--	--	0.0%	0.0%	0.0%
2-Butanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.0%	0.0%	0.0%	0.0%	0.0%	0.31%	2.8%	0.33%	3.4%
Bromodichloromethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon disulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon tetrachloride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodibromomethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodifluoromethane (Freon 22)[5]	--	--	--	--	--	--	0.0%	0.0%	0.0%
Chloroform	0.62%	2.6%	3.1%	3.3%	2.8%	1.9%	1.3%	7.9%	5.9%
cis-1,2-Dichloroethene	0.016%	0.032%	0.039%	0.033%	0.033%	0.060%	0.046%	0.044%	0.030%
Dichlorodifluoromethane (Freon 12)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.065%	0.066%	0.096%	0.060%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	0.0002%	0.0004%	0.0%	0.0%	0.0%	0.0%	0.0005%	0.0005%	0.0003%
Trichloroethylene	0.060%	0.78%	0.71%	1.7%	0.73%	5.0%	4.4%	6.2%	4.7%
Trichlorofluoromethane (Freon 11)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.14%	0.14%	0.0%	0.0%	0.0%	0.0%	0.047%	0.0%	0.052%
Xylenes - M,P	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Percent of Annual MASC[4][5]								
	3/12/2010	6/7/2010	8/30/2010	1/5/2011[6]	3/7/2011	6/8/2011	9/19/2011	12/5/2011	3/9/2012
1,1,1-Trichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.068%	0.053%	0.084%	0.078%	0.072%	0.054%	0.067%	0.051%	0.034%
1,1-Dichloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Butanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	0.0%	0.0003%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.057%	0.0%
Bromodichloromethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon disulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon tetrachloride	0.035%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodibromomethane	0.000%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chlorodifluoromethane (Freon 22)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chloroform	1.1%	1.1%	8.0%	4.5%	3.2%	1.6%	6.9%	5.7%	0.71%
cis-1,2-Dichloroethene	0.028%	0.041%	0.042%	0.029%	0.037%	0.030%	0.028%	0.025%	0.020%
Dichlorodifluoromethane (Freon 12)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	0.046%	0.093%	0.13%	0.052%	0.052%	0.065%	0.076%	0.044%	0.031%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	0.0004%	0.0003%	0.0005%	0.0003%	0.0%	0.0002%	0.0003%	0.0002%	0.0%
Trichloroethylene	3.3%	4.9%	6.8%	3.9%	4.6%	3.6%	4.1%	3.3%	2.4%
Trichlorofluoromethane (Freon 11)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.059%	0.0%	0.0%	0.047%	0.0%	0.036%	0.047%	0.043%	0.0%
Xylenes - M,P	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Percent of Annual MASC[4][5]								
	6/4/2012	9/17/2012	12/20/2012	3/28/2013	6/19/2013	9/5/2013	12/4/2013	3/11/2014	6/20/2014
1,1,1-Trichloroethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1,1-Dichloroethane	0.032%	0.050%	0.055%	0.040%	0.036%	0.054%	0.052%	0.032%	0.034%
1,1-Dichloroethene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Butanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2-Hexanone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acetone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benzene	0.078%	0.56%	0.25%	0.031%	0.058%	0.36%	0.0%	0.40%	0.0%
Bromodichloromethane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromoform	0.0041%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon disulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carbon tetrachloride	0.0%	0.043%	0.0%	0.0%	0.013%	0.017%	0.0%	0.0%	0.0%
Chlorodibromomethane	0.027%	0.0%	0.0%	--	--	--	--	--	--
Chlorodifluoromethane (Freon 22)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chloroform	0.87%	4.9%	7.5%	0.0033%	0.0028%	0.0036%	0.0077%	0.0016%	0.0023%
cis-1,2-Dichloroethene	0.019%	0.018%	0.020%	0.018%	0.022%	0.024%	0.024%	0.015%	0.023%
Dichlorodifluoromethane (Freon 12)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Methylene Chloride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tetrachloroethene	0.058%	0.068%	0.046%	0.0009%	0.012%	0.020%	0.010%	0.0057%	0.011%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
trans-1,2-Dichloroethene	0.0%	0.0002%	0.0002%	0.0%	0.0%	0.0002%	0.0002%	0.0%	0.0%
Trichloroethylene	2.7%	3.1%	2.8%	3.5%	6.8%	9.6%	8.5%	4.3%	6.8%
Trichlorofluoromethane (Freon 11)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vinyl chloride	0.0%	0.0%	0.023%	0.064%	0.041%	0.039%	0.040%	0.0%	0.051%
Xylenes - M,P	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Compound	Percent of Annual MASC[4][5]	
	9/10/2014	12/10/2014
1,1,1-Trichloroethane	0.0%	0.0%
1,1-Dichloroethane	0.029%	0.071%
1,1-Dichloroethene	0.0%	0.0%
1-Chloro-1,1-difluoroethane (Freon 142b)	0.0%	0.0%
2-Butanone	0.0%	0.0%
2-Hexanone	0.0%	0.0%
Acetone	0.0%	0.0%
Benzene	0.070%	0.066%
Bromodichloromethane	0.0%	0.0%
Bromoform	0.0%	0.0%
Carbon disulfide	0.0%	0.0%
Carbon tetrachloride	0.0%	0.013%
Chlorodibromomethane	--	--
Chlorodifluoromethane (Freon 22)	0.0%	0.0%
Chloroform	0.0018%	0.0030%
cis-1,2-Dichloroethene	0.010%	0.026%
Dichlorodifluoromethane (Freon 12)	0.0%	0.0%
Methylene Chloride	0.0%	0.0%
Tetrachloroethene	0.012%	0.012%
Toluene	0.0%	0.0%
trans-1,2-Dichloroethene	0.0%	0.0002%
Trichloroethylene	5.4%	9.1%
Trichlorofluoromethane (Freon 11)	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	0.0%	0.0%
Vinyl chloride	0.0%	0.061%
Xylenes - M,P	0.0%	0.0%

Notes and abbreviations on last page.

Table B-2. Summary of Maximum Allowable Stack Concentration Calculations, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.

Notes and Abbreviations:

AGC	Allowable Annual Guideline Concentration
DAR-1	Division of Air Resources Air Guide-1
MASC	Maximum Allowable Stack Concentration
$\mu g/m^3$	micrograms per cubic meter
NS	Guideline concentrations not specified in the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014.
NYSDEC	New York State Department of Environmental Conservation
SGC	Short-term Guideline Concentration
%	percent

1. Actual effluent concentrations are analytical results from air samples collected on the dates shown. Data in this table corresponds to the past year of system operation. Table summarizes detected compounds only.

2. AGC refers to the compound-specific AGC per the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014.

3. Annual MASC was calculated by dividing the product of the AGC of a compound and the ratio of the SCREEN3 gas emission rate and the SCREEN 3 average annual concentration at receptor height by the air flow rate at the stack temperature and multiplying by the appropriate conversion factors.

4. Percent of MASC was calculated by dividing the actual effluent concentration by the MASC for the past four quarters of operation.

5. Freon 22 and Freon 142b were reported as tentatively identified compounds through the March 2009 sampling event. Beginning with the April through June 2009 operational period, Freon 22 and Freon 142b have been incorporated into the site analyte list.

6. Analytical results from the total effluent vapor sample collected on December 3, 2010 indicated a sample collection or laboratory error; therefore, the December 3, 2010 total effluent vapor sample results were qualified as unusable. Accordingly, the total effluent vapor sample was recollected on January 5, 2011.

ARCADIS

Appendix C

Summary of Condensate Sample Analytical Results

ARCADIS

Appendix C-1. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1][2]

Compound (units in µg/L)	Sample ID: / Sample Date:	KO-200 3/17/2008	KO-300 3/17/2008	WSP-510 3/17/2008	ST-510 4/21/2009	SG001-6W 4/21/2009
	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,1-Dichloroethane	75-34-3	**1.4**	< 1.0	< 2.5	< 1.0	< 1.0
1,1-Dichloroethene	75-35-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,2,4-Trichlorobenzene	120-82-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	96-12-8	< 2.0	< 2.0	< 5.0	< 2.0	< 2.0
1,2-Dibromoethane	106-93-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,2-Dichloroethane	107-06-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,2-Dichloropropane	78-87-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
2-Butanone	78-93-3	**1,000**	**1,300**	**440**	**430**	< 5.0
2-Hexanone	591-78-6	< 5.0	< 5.0	< 13	< 5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	< 5.0	< 5.0	< 13	< 5.0	< 5.0
Acetone	67-64-1	**17**	**40**	**44**	**42**	< 5.0
Benzene	71-43-2	< 1.0	< 1.0	< 2.5	**4.8**	< 1.0
Bromodichloromethane	75-27-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Bromoform	75-25-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Bromomethane	74-83-9	< 2.0	< 2.0	< 5.0	< 1.0	< 1.0
Carbon Disulfide	75-15-0	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Carbon Tetrachloride	56-23-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Trichlorofluoromethane (Freon 11)	75-69-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Chlorobenzene	108-90-7	< 2.0	< 2.0	< 5.0	**1.5**	< 1.0
Dibromochloromethane	124-48-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Chloroethane	75-00-3	< 2.0	< 2.0	< 5.0	**1.9**	< 1.0
Chloroform	67-66-3	**40**	**4.0**	**15**	< 1.0	**14**
Chloromethane	74-87-3	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
cis-1,2-Dichloroethene	156-59-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Cyclohexane	110-82-7	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	75-71-8	< 1.0	< 1.0	**6.6**	**6.4**	< 1.0
Isopropylbenzene	98-82-8	< 10	< 10	< 25	< 2.0	< 2.0
Ethylbenzene	100-41-4	< 10	< 1.0	< 2.5	< 1.0	< 1.0
Methyl Acetate	79-20-9	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Methyl tert-butyl ether	1634-04-4	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Methylcylohexane	108-87-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Methylene Chloride	75-09-2	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Styrene	100-42-5	**2.2**	< 1.0	< 2.5	< 1.0	< 1.0
Tetrachloroethene	127-18-4	**1.1**	< 1.0	< 2.5	< 1.0	< 1.0
Toluene	108-88-3	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	**22**	**3.0**	**9**	< 1.0	**3.0**
trans-1,3-Dichloropropene	10061-02-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Trichloroethene	79-01-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Vinyl Chloride	75-01-4	**4.8**	**1.7**	< 2.5	< 1.0	< 1.0
Xylene-o	95-47-6	< 1.0	< 1.0	< 2.5	< 1.0	< 1.0
Xylenes - m,p	1330-20-7	< 1.0	< 1.0	< 2.5	< 2.0	< 2.0
TVOC[3]		**1,089**	**1,349**	**515**	**487**	**17**

Notes and abbrevations on last page.

ARCADIS

Appendix C-1. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/L)	Sample ID: / Sample Date:	ST-510 9/29/2009	SVE Condensate 3/29/2011	ST-510 3/31/2011	CON-1 3/8/2012	ST-510 3/9/2012
	CAS No.					
1,1,1-Trichloroethane	71-55-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	79-34-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	79-00-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	75-34-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	75-35-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	120-82-1	< 5.0	< 5.0	< 5.0	--	--
1,2-Dibromo-3-chloropropane	96-12-8	< 5.0	< 5.0	< 5.0	--	--
1,2-Dibromoethane	106-93-4	< 5.0	< 5.0	< 5.0	--	--
1,2-Dichlorobenzene	95-50-1	< 5.0	< 5.0	< 5.0	--	--
1,2-Dichloroethane	107-06-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	78-87-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	541-73-1	< 5.0	< 5.0	< 5.0	--	--
1,4-Dichlorobenzene	106-46-7	< 5.0	< 5.0	< 5.0	--	--
2-Butanone	78-93-3	< 10	< 10	< 10	< 10	< 10
2-Hexanone	591-78-6	< 10	< 10	< 10	< 10	< 10
4-Methyl-2-Pentanone	108-10-1	< 10	< 10	< 10	< 10	< 10
Acetone	67-64-1	< 20	< 20	< 20	< 10	< 10
Benzene	71-43-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	75-27-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	75-25-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	74-83-9	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon Disulfide	75-15-0	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	56-23-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane (Freon 11)	75-69-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	108-90-7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	124-48-1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	75-00-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	67-66-3	< 5.0	< 5.0	**6.0**	< 5.0	< 5.0
Chloromethane	74-87-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	156-59-2	< 10	< 10	< 10	--	--
cis-1,3-Dichloropropene	10061-01-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cyclohexane	110-82-7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dichlorodifluoromethane (Freon 12)	75-71-8	< 5.0	< 5.0	< 5.0	--	--
Isopropylbenzene	98-82-8	< 10	< 10	< 10	--	--
Ethylbenzene	100-41-4	< 5.0	< 5.0	< 5.0	--	--
Methyl Acetate	79-20-9	< 10	< 10	< 10	--	--
Methyl tert-butyl ether	1634-04-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methylcylohexane	108-87-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methylene Chloride	75-09-2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	100-42-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	127-18-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	108-88-3	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene	156-60-5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene	10061-02-6	< 5.0	< 5.0	< 5.0	--	--
Trichloroethene	79-01-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	75-01-4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Xylene-o	95-47-6	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Xylenes - m,p	1330-20-7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TVOC[2]		ND	ND	**6.0**	ND	ND

Notes and abbrevations on last page.

ARCADIS

Appendix C-1. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3, Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Compound (units in µg/L)	CAS No.	Sample ID: ST-510 Sample Date: 3/27/2013
1,1,1-Trichloroethane	71-55-6	< 5.0
1,1,2,2-Tetrachloroethane	79-34-5	< 5.0
1,1,2-Trichloroethane	79-00-5	< 5.0
1,1-Dichloroethane	75-34-3	< 5.0
1,1-Dichloroethene	75-35-4	< 5.0
1,2,4-Trichlorobenzene	120-82-1	--
1,2-Dibromo-3-chloropropane	96-12-8	--
1,2-Dibromoethane	106-93-4	--
1,2-Dichlorobenzene	95-50-1	--
1,2-Dichloroethane	107-06-2	< 5.0
1,2-Dichloropropane	78-87-5	< 5.0
1,3-Dichlorobenzene	541-73-1	--
1,4-Dichlorobenzene	106-46-7	--
2-Butanone	78-93-3	< 10
2-Hexanone	591-78-6	< 10
4-Methyl-2-Pentanone	108-10-1	< 10
Acetone	67-64-1	< 10
Benzene	71-43-2	< 5.0
Bromodichloromethane	75-27-4	< 5.0
Bromoform	75-25-2	< 5.0
Bromomethane	74-83-9	< 5.0
Carbon Disulfide	75-15-0	< 10
Carbon Tetrachloride	56-23-5	< 5.0
Trichlorofluoromethane (Freon 11)	75-69-4	< 5.0
Chlorobenzene	108-90-7	< 5.0
Dibromochloromethane	124-48-1	< 5.0
Chloroethane	75-00-3	< 5.0
Chloroform	67-66-3	< 5.0
Chloromethane	74-87-3	< 5.0
cis-1,2-Dichloroethene	156-59-2	--
cis-1,3-Dichloropropene	10061-01-5	< 5.0
Cyclohexane	110-82-7	< 5.0
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 5.0
Dichlorodifluoromethane (Freon 12)	75-71-8	--
Isopropylbenzene	98-82-8	--
Ethylbenzene	100-41-4	--
Methyl Acetate	79-20-9	--
Methyl tert-butyl ether	1634-04-4	< 5.0
Methylcylohexane	108-87-2	< 5.0
Methylene Chloride	75-09-2	< 5.0
Styrene	100-42-5	< 5.0
Tetrachloroethene	127-18-4	< 5.0
Toluene	108-88-3	< 5.0
trans-1,2-Dichloroethene	156-60-5	< 5.0
trans-1,3-Dichloropropene	10061-02-6	--
Trichloroethene	79-01-6	< 5.0
Vinyl Chloride	75-01-4	< 5.0
Xylene-o	95-47-6	< 5.0
Xylenes - m,p	1330-20-7	< 5.0
TVOC[2]		ND

Notes and abbrevations on last page.

ARCADIS

Appendix C-1. Summary of Condensate Sample Analytical Results, Northrop Grumman Operable Unit 3,
Bethpage Park Soil Gas Containment System, Former Grumman Settling Ponds, Bethpage, New York.[1]

Notes and Abbreviations:

Bold	Bold data indicates that the analyte was detected at or above its reporting limit.
CAS No.	Chemical abstracts service list number.
µg/L	Micrograms per liter.
ND	No compounds detected.
NA	Not analyzed.
NA	Not applicable.
TVOC	Total volatile organic compounds.
VOC	Volatile organic compound.

1. Water samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analysis per Method 8260.
2. Water samples were collected to characterize condensate generated during the operation of the system prior to discharge. Quarters when a sample was not collected are not included in this summary.
3. TVOC determined by summing individual detections and rounding to the nearest whole number.