Second Quarter 2005 Groundwater Monitoring Report

Operable Unit 2
Northrop Grumman Corporation,
Bethpage, New York
NYSDEC Site #1-30-003A

ARCADIS
Infrastructure, environment, buildings

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1. Introduction

This groundwater monitoring report was prepared to document the operation, maintenance, and monitoring (OM&M) activities for the Operable Unit 2 (OU2) groundwater remedy at the Northrop Grumman Corporation (NGC) Bethpage, New York facility. These activities are currently being conducted by NGC, in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved OU2 Groundwater Monitoring Plan (ARCADIS Geraghty & Miller, Inc. 2001), as modified in June 2004 (ARCADIS G&M Inc. 2004a) and the Public Water Supply Contingency Plan (PWSCP) (ARCADIS G&M Inc. 2003b) to meet the remedial objectives set forth in the March 2001 Record of Decision (ROD) (NYSDEC 2001).

Overall, this report describes the operational and effectiveness monitoring of the on-site portion of the OU2 groundwater remedy for the period from March 29 through June 29, 2005, which is referred to in this report as the Second Quarter 2005 report period. The Annual Report, which is issued after the completion of each calendar year, includes an evaluation of long-term data trends. The complete description of the monitoring program and rationale/basis for evaluation of data can be found in the 2002 Annual Report (ARCADIS G&M, Inc. 2003a). The contents of the OM&M reports, as well as the findings and conclusions made, will continue to be re-evaluated in future reports as additional data become available.

2. Monitoring Program

The results obtained from monitoring activities conducted for this report period are provided in Tables 1 through 13 and are described and discussed in the following report sections: Remedial System Operational Monitoring (Section 3), Groundwater Flow (Section 4), and Groundwater Quality (Section 5).

Except as described on Tables 1 through 13 and in Sections 3, 4, and 5 of this report, the procedures, methodologies, and monitoring network utilized for the subject period are consistent with procedures and methodologies used previously (as described in ARCADIS G&M, Inc. 2003a) and the NYSDEC-approved OU2 Groundwater Monitoring Plan (ARCADIS Geraghty & Miller, Inc. 2001), as modified in June 2004 (ARCADIS G&M, Inc. 2004a). The complete description of the procedures to collect groundwater samples from outpost wells and evaluate and document the results is provided in the PWSCP (ARCADIS G&M, Inc. 2003b).

The locations of the NGC site, the OU2 groundwater remedy, the neighboring properties (i.e., the Naval Weapons Industrial Reserve Plant [NWIRP] and Occidental Chemical Corporation [OCC]/RUCO Polymer Corporation sites), and existing wells utilized in the monitoring programs are shown on Figure 1. This report also includes the following appendices: Appendix A (water-level measurement logs); Appendix B (groundwater sampling logs); and Appendix C (chain-of-custody records).

3. Remedial System Operational Monitoring

This section of the report summarizes the routine operational monitoring tasks conducted during the Second Quarter 2005 for the on-site portion of the OU2 groundwater remedy, which included the following: (1) treatment system effluent water quality monitoring, remedial well water quality monitoring, treatment systems efficiency monitoring and determination of volatile organic compound (VOC) mass removal from the aquifer, and (2) monitoring of remedial well pumpage and treatment systems treated effluent discharge to on-site recharge basins.

Also summarized in this report section are troubleshooting and non-routine maintenance activities performed by ARCADIS and NGC during the Second Quarter 2005.

3.1 Water Quality, Treatment Efficiencies, and Mass Removal

Tables 1 and 9 provide the total VOC (TVOC) concentrations detected in the OU2 remedial wells. Table 1 provides TVOC concentrations and TVOC mass removed by the remedial wells, and treatment efficiencies for the GP-1 (hereinafter referred to as Tower 96) and ONCT (hereinafter referred to as Tower 102) treatment system air strippers.

TVOC concentrations from the remedial wells ranged from 126.7 micrograms per liter (µg/L) (ONCT-3) to 2,770 µg/L (GP-3); a total of approximately 2,347 pounds of VOCs were removed from the aquifer by the remedial wells during the Second Quarter 2005. Figure 5 provides the cumulative VOC mass removal for the OU2 Remedial Wells through the end of the Second Quarter 2005. Since start-up of the system in February, 1998, approximately 86,743 pounds of VOC mass have been removed from the aquifer.

Beginning this report, NGC's SPDES (State Pollutant Discharge Elimination System) discharge monitoring results (under Permit No. NY0096792) will be used as the final

treated water quality in calculating remedial system treatment efficiency and documenting the quality of water returned to the aquifer. SPDES discharge monitoring data are documented by NGC to NYSDEC on a monthly basis in Discharge Monitoring Reports (DMRs) (Northrop Grumman Corporation 2005a, 2005b and 2005c) and the average VOC concentration entering site outfalls this period are provided in Table 1. NGC Outfalls 005 and 006 represent the termini of the Tower 102 and Tower 96 system effluent water (i.e., inlets to the South and West Recharge Basins), respectively. Based on the ratio of influent VOC concentrations to the average quarterly VOC concentrations in SPDES discharge monitoring, the efficiencies of the Tower 96 and Tower 102 systems are both approximately 99.8 percent for the Second Quarter 2005 (Table 1).

3.2 Remedial System Pumpage and Discharge

Table 1 summarizes the pumpage of the remedial wells (with comparison to design criteria) for the Second Quarter 2005. Remedial Wells GP-1, GP-3, ONCT-1, ONCT-2, and ONCT-3 pumped approximately 473 million gallons (MG) of groundwater, which is equivalent to 93 percent of the design remedial well pumpage volume of 507 MG. As of April 14, 2005, the NYSDEC-approved, revised design pumpage rate for Remedial Well GP-3 is 700 gallons per minute (gpm). Additionally, the revised, NYSDEC-approved design rate for Remedial Well GP-1 was decreased from 1,075 gpm to 800 gpm, to stay within the hydraulic limits of the Tower 96 system used to treat the discharge of these wells (ARCADIS G&M, Inc. 2005). Based on weekly measurements collected by ARCADIS, the South Recharge Basins collectively received the treated effluent discharge from the Tower 102 remedial system (approximately 2,405 gallons per minute [gpm]), incidental stormwater runoff, along with approximately 433 gpm from the GP-1 remedial system, for a total discharge of approximately 2,838 gpm.

A portion of the treated effluent water from the Tower 96 remedial system is provided to the adjacent Calpine Energy facility for consumptive use. Based on the newly-installed peaker unit, the supply rate fluctuates between 600 and 1000 gpm, based on demand from Calpine. The flow is variable and controlled by Cla Val via a new transit line between Tower 96 and the Calpine facility. The actual flow rate to Calpine (and therefore to the West Recharge Basins) for this quarter is currently unavailable; for the purpose of this report, the minimum supply rate of 600 gpm to Calpine is assumed for calculating the balance of treated water from the Tower 96 remedial system. NGC is currently pursuing information from Calpine regarding their water usage for this quarter; the actual flow rate to both Calpine (and therefore the West Recharge Basins)

will be provided when they become available. Assuming 600 gpm of treated effluent from the Tower 96 remedial system was provided to Calpine this round, the West Recharge Basins received an average of approximately 333 gpm from the Tower 96 remedial system (i.e. the balance of the treated effluent from the Tower 96 remedial system).

3.3 Remedial Wells Specific Capacities

Table 2 summarizes the water-level measurement data, corresponding instantaneous pumping rates, and the calculated drawdowns and specific capacities for the OU2 remedial wells for the Second Quarter 2005. Based on the data presented herein, the specific capacities of all the remedial wells exceeded the minimum values needed to maintain the design pumping rates.

3.4 Troubleshooting and non-Routine Maintenance

This section describes non-routine maintenance and response items that occurred in the Second Quarter 2005.

3.4.1 Well GP-3 Update

Remedial Well GP-3 was shut down during the early portion of the Second Quarter 2005 as part of ongoing well re-development to achieve the revised design pumping rate of 700 gpm. Based on the results of plumbness/alignment testing performed on Well GP-3 (by Delta Well & Pump Co., Inc.), it was determined that Well GP-3 was not sufficiently plumb to accommodate a vertical turbine pump. Therefore, ARCADIS designed a submersible pump to serve as the permanent replacement pump. After re-development was completed, a temporary submersible pump was installed so that the well could be operated until the permanent replacement pump was ready for installation. Remedial Well GP-3 was re-started on April 7, 2005 and operated continuously at approximately 630 gpm until April 20, 2005. From April 20, 2005 to June 23, 2005, Well GP-3 operated intermittently at approximately 510 gpm, due to successive electrical failures of two temporary submersible pumps. Upon failure of the second temporary pump, Well GP-3 was shut down from June 23, 2005 and remained off through the end of the Second Quarter 2005. The permanent submersible pump is expected to be installed and the well re-started at 700 gpm early in the Third Quarter 2005.

3.4.2 Tower 96 Discharge to West Basins

On June 2, 2005, there was an apparent discharge of partially treated groundwater from Tower 96 to the West Basins (i.e., Outfall 006). The water discharge rate was estimated at 1,500 gpm and occurred over a 6-hour period, for a total volume of discharge of approximately 540,000 gallons of water.

The incident occurred during an upgrade to the Tower 96 system main controls (by an outside vendor). NGC shut down the Tower 96 system prior to the upgrade. Unknown to NGC at the time, the pump interlock controls for Wells GP-1 and GP-3 had unintentionally been disconnected from the Tower 96 main system controls. Upon shutdown of the Tower 96 main system, (which normally then shuts down all blowers and pumps), the blowers were shut down, however the well pumps remained operational, which resulted in well water being pumped through the air stripper without the benefit of the main blower. The partially treated groundwater was discharged to the West Recharge Basins. Upon identifying this condition, NGC immediately turned off the remedial wells and notified the NYSDEC. Tower 96 system control interlocks have since been re-established and in the future NGC will visually confirm that the well pumps are shut down if the Tower 96 system is shut down to ensure that this incident does not recur.

ARCADIS reviewed historic water quality data and remedial system information to evaluate the effect, if any, of the discharge on groundwater quality. As documented in previous reports, Tower 96 influent TVOC concentration is comprised primarily of TCE and vinyl chloride (VMC), with influent TCE and VCM concentrations estimated at 800 ug/L and 40 ug/L, respectively. In passing through the air stripper without the main blower, the air-water contact through the tower would be expected to reduce the TCE concentration and eliminate VCM from the water stream. Additional water aeration would be expected to occur as the water enters/exists the Tower 96 wet well, site storm sewer pipe, and West Recharge Basin inlet, (equipped with cascading concrete steps) in sequence. ARCADIS estimates that water entering the basin would have contained approximately 250 to 300 of TCE. As discussed with NYSDEC, ARCADIS closely monitored the wells between the West Recharge Basins (i.e., Wells GM-17S and GM-17I) to evaluate the effect, if any, of the discharge on local groundwater quality. Sampling results from Wells GM-17S and GM-17I indicate no change in TVOC concentration, indicating that the discharge had a negligible effect on local groundwater quality (see Section 5).

Other shorter term periods of well/system downtime occurred during the Second Quarter 2005 (for both the Tower 96 and Tower 102 Systems); these were due to short-term repairs, inspections, and temporary power outages.

4. Groundwater Flow

This report section describes the results of hydraulic monitoring performed during the Second Quarter 2005 (i.e., measured on June 14 and 15, 2005). The evaluation of the hydraulic data was performed using methods described in previous quarterly reports.

4.1 Shallow and Intermediate Zones

The water-level measurement data for the Second Quarter 2005 are provided in Table 3. Vertical hydraulic gradients calculated for select well pairs and a comparison to model-predicted gradients (see Appendix B of the OU2 Feasibility Study; ARCADIS Geraghty & Miller 2000) are provided in Table 4. Figure 2 depicts the water-table configuration and groundwater flow directions, and Figure 3 depicts the potentiometric surface elevation and groundwater flow directions in the intermediate zone.

With the exception of Wells GM-15S/GM-15I, the vertical hydraulic gradients in shallow-intermediate well pairs are oriented downward and are close to or greater than model predicted values (Table 4). Figures 2 and 3 show the extent of the mounding of the water table and potentiometric surface in the shallow and intermediate zones, respectively, during the Second Quarter 2005. The observed mounding extends around and beneath the South Recharge Basins and across the entire NGC site southern boundary. The extent of the mounding is consistent with prior rounds and is typical of the conditions that produce a hydraulic barrier to groundwater flow in the shallow and intermediate zones during normal operation of the on-site portion of the OU2 groundwater remedy.

The hydraulic data described above support the conclusion that shallow recharge at the South Recharge Basins is sufficient to maintain the hydraulic barrier to groundwater flow that continues to be effective in achieving the OU2 remedial goal of preventing the off-site migration of VOC-impacted groundwater in the shallow and intermediate zones.

4.2 Deep and D2 Zones

Vertical hydraulic gradients (see Table 4) in intermediate-deep and deep-deep2 (D2) well pairs are oriented downward and are close to or are greater than the model predicted values. These data support the conclusion that groundwater is flowing in a predominantly vertical direction in the deep zone along the NGC site southern boundary.

Figure 4 depicts the potentiometric surface elevation in the D2 zone that illustrates the cumulative capture zone formed by the combined pumpage of the OU2 remedial wells during the Second Quarter 2005. The capture zone extends across the entire NGC site southern boundary and approximately 500 ft south of the NGC site in a downgradient direction.

These data are consistent with previous water-level rounds and support the conclusion that the pumpage of the remedial wells forms a hydraulic barrier to groundwater flow that continues to be effective in preventing the off-site migration of VOC-impacted groundwater in the deep and D2 zones.

4.3 Summary

Based on the data presented above, the combination of shallow recharge at the South Recharge Basins coupled with pumpage of the OU2 remedial wells in the D2 zone forms a hydraulic barrier to groundwater flow that continues to be effective in achieving the OU2 remedial goal of preventing the off-site migration of VOC-impacted groundwater.

5. Groundwater Quality

This report section describes the analytical results of the various groundwater quality monitoring activities for the Second Quarter 2005 that are specified in and required under the NYSDEC-approved Groundwater Monitoring Plan (ARCADIS G&M, Inc. 2001), as modified in the NYSDEC-approved June 13, 2004 petition (ARCADIS G&M, Inc. 2004a), and the PWSCP (ARCADIS G&M Inc., 2003b). Analytical results are summarized in Tables 5 through 13 and described in the following sections.

5.1 Volatile Organic Compounds

The evaluation of VOC concentrations is presented here in consideration of the following factors: (1) proximity to the hydraulic barrier formed by the on-site portion of the OU2 groundwater remedy (i.e., upgradient, along the NGC site southern boundary, and downgradient of the hydraulic barrier), (2) hydrogeologic zone (i.e., shallow, intermediate, deep, and D2 zones), and (3) NYSDEC Standards, Criteria, and Guidance (SCG) Values. A discussion of the expected effect on groundwater quality from operating the on-site portion of the OU2 groundwater remedy is provided in the 2002 Annual Report (ARCADIS G&M, Inc. 2003a).

A summary of total VOCs detected in the select wells at the NGC site southern perimeter and a comparison to SCGs is provided in Table 5.

5.1.1 Shallow and Intermediate Zones

The Second Quarter 2005 groundwater quality analytical results for shallow and intermediate monitoring wells are provided in Tables 6 and 7, respectively. In general, the water quality data from the shallow and intermediate wells sampled this quarter continue to support the interpretation of hydraulic data from the current and previous quarters and confirm that the operation of the on-site portion of the OU2 groundwater remedy has formed an effective hydraulic barrier that prevents the off-site migration of VOC-impacted groundwater in the shallow and intermediate zones. The current data show no exceedences of SCGs near the NGC site boundary in the shallow and intermediate zones (Tables 5, 6, and 7).

5.1.2 Deep Zone

In general, the water quality data from the deep wells sampled during the Second Quarter 2005 continue to support the interpretation of the hydraulic data from the current and previous quarters and confirm that the operation of the on-site portion of the OU2 groundwater remedy has formed an effective hydraulic barrier that prevents the off-site migration of VOC-impacted groundwater in the deep zone.

Four of the seven deep wells (GM-18D, GM-39D_A, GM-39D_B, and GM-73D) located along or upgradient of the line of remedial wells near the NGC site southern boundary (Table 8 and Figure 1), exhibited SCG exceedences. The remaining three deep wells (GM-15D, GM-17D, and GM-74D) exhibited trace VOC detections and no SCG exceedences. Based on evaluation of the hydraulic data that is depicted on Figure 4,

these monitoring wells are within the capture zone of the remedial wells and, therefore, groundwater in this area is hydraulically contained and, over time, will be extracted and treated by the on-site portion of the OU2 groundwater remedy.

The two deep wells (GM-20D and GM-21D) immediately downgradient of the NGC site southern boundary (Tables 5 and 8) exhibited no or trace VOC detections and no SCG exceedences. Well GM-79D, located further downgradient, exhibited one SCG exceedence.

5.1.3 Deep2 Zone

Groundwater monitoring data from the D2 zone are summarized in Table 9. In general, water quality data from the D2 wells sampled during the Second Quarter 2005 continue to support the interpretation of hydraulic data from the current and previous quarters and confirm that the operation of the on-site portion of the OU2 groundwater remedy has formed an effective hydraulic barrier that prevents the off-site migration of VOC-impacted groundwater in the D2 zone.

Along the line of remedial wells near the NGC site southern boundary, total VOC concentrations were highest in Remedial Well ONCT-1 (475 ug/L) and Monitoring Well GM-73D2 (260.9 ug/L), located approximately 700 ft east of Well ONCT-1 (Table 9). Monitoring Well GM-33D2 (at the NGC site southwestern boundary) and wells located east of Well GM-73D2 (Wells ONCT-2, GM-74D2, ONCT-3 and GM-15D2) exhibited one or more exceedences of SCGs (Table 9); total VOC concentrations in these areas, by comparison to Wells ONCT-1 and GM-73D2, are substantially lower and ranged from 17 ug/L (Well GM-74D2) to 153 ug/L (Well ONCT-2). Based on hydraulic data depicted on Figure 4, on-site wells near the NGC site southern boundary are within the capture zone of the remedial wells (screened in the D2 zone) and therefore groundwater in this area is hydraulically contained and, over time, will be extracted and treated by the on-site portion of the OU2 groundwater remedy.

The three off-site D2 wells (GM-34D2, GM-35D2 and GM-75D2) exhibited SCG exceedences with total VOC concentrations ranging from 341 ug/L (Well GM-75D2) to 415 ug/L (Well GM-34D2). These data are consistent with the expected concentrations in the off-site portion of the groundwater plume in the D2 zone that is not actively remediated.

5.2 Outpost Monitoring

The results of the Second Quarter 2005 outpost well monitoring round are provided in Table 10. VOCs were not detected in Outpost Wells OW1-2, OW3-1, OW4-1, and OW4-2 this round. Outpost Wells OW1-1, OW1-3, OW2-1 and OW2-2 exhibited one or more detections of site-related VOCs, with no SCG exceedences. These wells initially exhibited exceedences of their respective trigger values during the First and Second Quarter 2004; the requirements for initial exceedences, as outlined in the PWSCP (ARCADIS G&M, Inc., 2003b), were met at that time. During the Second Quarter 2005, benzene and methyl tert-butyl ether (MTBE) (neither VOC is site-related) were detected in Well OW2-1, exceeding their respective SCGs of 0.7 ug/L and 10 ug/L, respectively. Additionally, 1,2,3-trichlorobenzene (a non-site-related VOC) was detected in Outpost Well OW3-2, below the SCG of 5 ug/L.

5.3 Vinyl Chloride Monomer

Vinyl chloride monomer (VCM) concentrations in groundwater samples collected during the Second Quarter 2005 are provided in Tables 6 through 9. VCM continues to be present in Well GP-3 (140 ug/L during the Second Quarter 2005), but was not detected in the other remedial wells, or the monitoring wells sampled this round. Additional groundwater monitoring of the extent of the VCM subplume and evaluation of remedial options for VCM is being performed by Oxy.

5.4 Cadmium and Chromium

The results of the quarterly monitoring of wells analyzed for cadmium and chromium (Cd/Cr) are provided in Table 11. Well MW-3R (near former NGC Plant 2) exhibited the only Cd SCG exceedence (Figure 1 and Table 11). The data indicate that Cr exceeded the SCG in three of the ten monitoring wells sampled this round, with exceedences limited to on-site areas adjacent to former NGC Plant 1. Comparison of the total/dissolved results indicates that Cd/Cr are present in groundwater predominantly in the dissolved phase.

5.5 Tentatively Identified Compounds

The results of the laboratory qualitative assessment of Tentatively Identified Compound (TIC) concentrations in the samples collected during the Second Quarter 2005 are provided in Table 12. Because TIC data is qualitative in nature, ARCADIS will monitor the TICs; if trends develop to indicate that it is frequently present,

ARCADIS will consider petitioning the NYSDEC to add the subject TIC to the list of constituents monitored.

5.6 QA/QC Samples and Data Validation

The results of analysis of field blanks and trip blanks are provided in Table 13.

ARCADIS performed validation of all groundwater quality data collected (including TICs) by following the contract laboratory program national functional guidelines for organic and inorganic data review (USEPA 1999). The quality of the data is considered acceptable with the qualifications indicated on Tables 6 through 13.

6. Summary and Conclusions

The findings of the OM&M activities performed during the Second Quarter 2005 are summarized below.

1. The remedial system pumpage data show that the OU2 remedial wells pumped approximately 93 percent of the design volume of groundwater. Recharge basins received a collective total of approximately 413 MG of treated water this quarter. Well GP-3 is currently off-line for pump replacement; when the well is operational, the pumping rate will be increased to 700 gpm.

2. OU2 remedial well specific capacities remain above the minimum required to sustain the design pumping rates.

3. The inadvertent discharge of 540,000 gallons of partially treated water from Tower 96 to the West Recharge Basins had a negligible effect on local groundwater quality. ARCADIS will continue to closely monitor wells around the West Recharge Basins on the established schedule.

4. Approximately 2,347 lbs of VOCs were removed from the aquifer and treated by the on-site portion of the OU2 groundwater remedy.

5. The treatment efficiencies of both groundwater remedial systems remain above 99 percent.

6. The groundwater quality and hydraulic data indicate conditions that are consistent with previous rounds and that remedial goals continue to be met.

7. In the shallow, intermediate and deep zones, the majority of wells located along the NGC site perimeter show trace or non-detectable concentrations of VOCs.

8. Site-related VOCs continue to be detected in Outpost Wells OW1-1, OW1-3, OW2-1 and OW2-2. The remaining outpost wells exhibited no site-related VOC detections.

9. Cd/Cr SCG exceedences are limited to on-site areas.

7. Recommendation

ARCADIS makes no recommendation for modification of the groundwater monitoring program at this time.

8. References

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Table 1. Summary of Operational Data and Water Balance for the On-Site Portion of the OU2 Groundwater Remedy, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

Identification	Design Pumping/ Recharge Rate [a] (gpm)	Current Actual Average Pumping/Recharge Rate [b] (gpm)	Design Total Pumpage/Recharge (MG)	Current Actual Total Pumpage/Recharge (MG)	Current Percent of Design Pumpage/ Recharge	Current TCE Concentration (ug/L)	Current TVOC Concentration [c] ug/L	Current Estimated VOC Mass Removed [d] (lbs)
Remedial Wells			**Groundwater Removed from Aquifer**					
GP-1	825	950	109.3	124.6	114%	540	691	717
GP-3	700	416	92.7	38.6	42%	2,500	2,770	890
ONCT-1	1,000	1,062	132.5	136.5	103%	450	475	540
ONCT-2	600	612	79.5	78.7	99%	140	153	100
ONCT-3	700	731	92.7	94.9	102%	96	126.7	100
Rounded Totals:	**3,825**	**3,771**	**507**	**473**	**93%**	--	--	**2,347**
Recharge Basins [a]			**Treated Water Recharged to Aquifer**					
West Recharge Basins	412	333	55	44.1	125%	--	--	--
South Recharge Basins	2,231	2,838	295.6	368.5	125%	--	--	--
Rounded Totals:	**2,643**	**3,171**	**351**	**412.6**	**118%**	--	--	--
			Treated Water Sent to Calpine					
Calpine Demand	600-1000	600	80-133	78.7	--	--	--	--

Treatment Efficiencies

Tower 96 System Efficiency [e] : **99.8%**
Tower 102 System Efficiency [e] : **99.8%**

Average SPDES Outfall Concentrations for Second Quarter (ug/L)

Outfall 006: 2.4
Outfall 005: 0.6

see footnotes on last page

Table 1. Summary of Operational Data and Water Balance for the On-Site Portion of the OU2 Groundwater Remedy, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

(a) - Remedial well pumping rates based on computer modeling (ARCADIS Geraghty & Miller, Inc. 2000). Acceptable minimum recharge rates based on computer modeling (ARCADIS G&M, Inc. 2004b). Design pumping and recharge rates were modified in April, 2005. Total recharge includes remedial well pumpage (minus pipe loss) and incidental runoff from precipitation. Current average recharge rates have been determined using the entire 92-day span of time as opposed to current average pumping rates, which account for varying amounts of downtime, as indicated below.

(b) - Actual Average Pumping Rates were calculated based on Actual Total Pumpage and hours of operation from March 29 to June 29, 2005. (92 days).

- OU2 wells were operational during the Second Quarter 2005, at the following percentages: GP-1 (99%), GP-3 (70%); ONCT-1 (97%), ONCT-2 (97%), and ONCT-3 (98%). The Actual Average Pumping Rates are for when the wells are pumping.

(c) - The TVOC concentration for each well was calculated based on Second Quarter 2005 groundwater monitoring data (Table 9).

(d) - TVOC mass removed during the Second Quarter 2005 was based on the TVOC data given above and the following formula:

(TVOC concentration in ug/L) X (gallons pumped) X (3.785 L/gal) X (1 x 10^{-6} g/ug) X (2.2 x 10^{-3} lb/g)

(e) Remedial System Efficiency calculated from values above and in Table 9 using the following formula:

$$1 - \left[\frac{\text{Average SPDES TVOC Concentration at Outfall}}{\dfrac{[(\text{TVOC}_{\text{Well 1}} \times Q_{\text{Well 1}}) + (\text{TVOC}_{\text{Well 2}} \times Q_{\text{Well 2}}) + \ldots]}{(Q_{\text{Well 1}} + Q_{\text{Well 2}} + \ldots)}} \right]$$

Tower 102 System Efficiency calculated does not account for incidental contribution from Tower 96.
When non-detectable levels of VOCs are found in the effluent, a value of zero is used to estimate the efficiency of the air stripper.

--	Not Available or Not Applicable	lb/g	pounds per gram
TVOC	Total Volatile Organic Compounds	lbs	pounds
g/ug	grams per microgram	MG	Million Gallons
gpm	gallons per minute	ug/L	micrograms per liter
L/gal	Liters per gallon	OU2	Operable Unit 2
SPDES	State Pollutant Discharge Elimination System	Q	Pumping Rate

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Table 2. OU2 Remedial Well Performance Data, Baseline and Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

	Baseline		Second Quarter 2005				
Well Identification	Static Depth to Water[1] (ft bmp)	Specific Capacity[1] (gpm/ft)	Date of Pumping and Water-Level Measurements	Pumping Depth to Water (ft bmp)	Drawdown (ft)	Instantaneous Pumping Rate[2] (gpm)	Specific Capacity (gpm/ft)
ONCT-1	44.12	44.03	6/14/2005	60.8	16.68	900	54.0
ONCT-2	50.15	38.09	6/14/2005	67.07	16.92	800	47.3
ONCT-3	49.13	40.12	6/14/2005	65.24	16.11	680	42.2
GP-1	55.75	28.57	6/14/2005	94.0	38.25	960	25.1
GP-3	54.4	10.10	6/14/2005	111.35	56.95	520	9.1

(1) For Wells ONCT-1, ONCT-2 and ONCT-3, baseline static depth to water measurements were collected in 1997 prior to OU2 system start-up; baseline pumping depth to water and rate measurements were collected in 1999 during OU2 system operation.
For Well GP-1, baseline static depth to water and specific capacity measurements were collected in 2001, during pump replacement.
For Well GP-3, baseline static depth to water and specific capacity measurements were collected in March-April 2005, during re-development activities.

(2) Pumping rate collected at time of pumping depth to water measurement.

OU2	Operable Unit 2
gpm	gallons per minute
ft bmp	feet below measuring point
ft	feet
gpm/ft	gallons per minute per foot of drawdown

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Table 3. Water-Level Measurement Data, June 14 and 15, 2005, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Shallow Wells			
FW-03	124.30	56.35	67.95
N-9921	94.23	32.82	61.41
N-10597	109.85	42.39	67.46
N-10600	102.41	39.75	62.66
N-10631	103.47	38.60	64.87
N-10633	103.80	39.80	64.00
N-10634	101.20	40.35	60.85
N-10821	91.58	34.92	56.66
GM-15S	109.44	45.08	64.36
GM-16SR	115.86	48.55	67.31
GM-17SR	115.79	48.39	67.40
GM-18S	107.60	40.72	66.88
GM-19S	109.86	42.25	67.61
GM-21S	105.81	36.20	69.61
GM-78S	104.94	41.58	63.36
GM-79S (N-10628)	100.88	40.52	60.36
HN-24S	--	52.85	--
HN-40S	116.35	49.19	67.16
HN-42S	120.32	51.39	68.93
MW-3R	101.45	34.92	66.53
Intermediate Wells			
N-10624	93.61	32.49	61.12
GM-15I	109.25	44.81	64.44
GM-16I	115.81	48.55	67.26
GM-17I	115.83	48.51	67.32
GM-18I	109.03	43.15	65.88
GM-19I	109.86	43.55	66.31
GM-20I	103.88	35.93	67.95
GM-21I	105.72	36.28	69.44
GM-74I	107.42	40.14	67.28
GM-78I	105.06	41.89	63.17
GM-79I	100.88	40.95	59.93
HN-24I	125.80	56.26	69.54
HN-29I	116.42	47.22	69.20
HN-40I	115.91	49.02	66.89
HN-42I	119.61	50.68	68.93

See notes on last page

Table 3. Water-Level Measurement Data, June 14 and 15, 2005, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Deep Wells			
N-10627	93.70	33.04	60.66
GM-13D	113.97	46.82	67.15
GM-15D	109.84	47.59	62.25
GM-17D	115.68	50.77	64.91
GM-18D	108.88	46.10	62.78
GM-20D	103.92	38.60	65.32
GM-21D	105.66	43.68	61.98
GM-34D	71.19	18.20	52.99
GM-36D	91.63	36.15	55.48
GM-37D	97.26	40.08	57.18
GM-38D	91.75	40.16	51.59
$GM\text{-}39D_A$[1]	102.23	39.46	62.77
$GM\text{-}39D_B$[1]	102.08	42.57	59.51
GM-73D	104.87	44.79	60.08
GM-74D	107.43	45.83	61.60
GM-79D	101.25	42.57	58.68
HN-29D	115.11	47.45	67.66
Deep2 Wells			
GM-15D2	109.78	50.37	59.41
GM-33D2	106.85	50.17	56.68
GM-34D2	71.19	15.12	56.07
GM-35D2	96.28	41.96	54.32
GM-36D2	91.60	40.40	51.20
GM-37D2	97.17	41.28	55.89
GM-38D2	91.56	44.20	47.36
GM-70D2	99.58	42.20	57.38
GM-71D2	98.45	43.50	54.95
GM-73D2	104.62	46.93	57.69
GM-74D2	107.36	52.69	54.67
GM-75D2	93.63	36.59	57.04
GP-1[2]	116.78	94.00	22.78
GP-3	–	111.35	--
ONCT-1[3]	104.10	60.80	43.30
ONCT-2	110.00	67.07	42.93
ONCT-3	108.70	65.24	43.46

See notes on last page

Table 3. Water-Level Measurement Data, June 14 and 15, 2005, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft bmp)	Water-Level Elevation (ft msl)
Outpost Wells			
BPOW1-1	73.65	29.71	43.94
BPOW1-2	73.54	33.92	39.62
BPOW1-3	73.37	33.80	39.57
BPOW2-1	60.06	22.54	37.52
BPOW2-2	59.96	24.66	35.30
BPOW3-1	63.19	29.20	33.99
BPOW3-2	63.72	31.25	32.47
BPOW4-1	67.34	31.54	35.80
BPOW4-2	67.18	30.68	36.50

(1) Wells GM-39_A and GM-39_B are screened at the approximate midpoint and basal portion of the deep zone, respectively.

(2) Water level was measured by inflating airline set at 120 ft bmp (gauge at wellhead) and subtracting the reading on the gauge from 120 to obtain the depth to water in feet.

(3) Water level was measured by inflating airline set at 110 ft bmp (gauge at wellhead) and subtracting the reading on the gauge from 110 to obtain the depth to water in feet.

ft msl feet relative to mean sea level

ft bmp feet below measuring point

– Not Measured

Table 4. Comparison of June 14 and 15, 2005, Vertical Hydraulic Gradients to Model Predicted Gradients, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Pair ID	Well Screen Midpoint Elevation (ft msl)	Water-Level Elevation (ft msl)	Vertical Gradient [2] (ft/ft) * 10^3	Model-Predicted, OU2 Steady-State Vertical Gradient (ft/ft) * 10^3	Increase Compared to Model-Predicted, Steady-State Vertical Gradient
Shallow-Intermediate Wells					
GM-15S	34.53	64.36			
GM-15I	9.29	64.44	-3.17	4.20	-7.37
GM-16SR	66.77	67.31			
GM-16I	-24.19	67.26	0.55	1.11	-0.56
GM-17SR	50.79	67.40			
GM-17I	5.83	67.32	1.78	4.50	-2.72
GM-21S	40.81	69.61			
GM-21I	-29.28	69.44	2.43	18.44	-16.01
GM-78S	39.94	63.36			
GM-78I	5.56	63.17	5.53	8.73	-3.20
GM-79S	35.88	60.36			
GM-79I	-73.91	59.93	3.92	0.91	3.01
Intermediate-Deep Wells					
GM-15I	9.29	64.44			
GM-15D	-227.34	62.25	9.25	6.52	2.73
GM-17I	5.83	67.32			
GM-17D	-172.32	64.91	13.53	7.86	5.67
GM-18I	9.03	65.88			
GM-18D	-186.12	62.78	15.89	7.74	8.15
GM-20I	3.88	67.95			
GM-20D	-117.08	65.32	21.74	18.22	3.52
GM-21I	-29.28	69.44			
GM-21D	-177.34	61.98	50.38	43.97	6.41
GM-74I	8.42	67.28			
GM-74D	-192.57	61.60	28.26	20.17	8.09
GM-79I	-73.91	59.93			
GM-79D	-183.75	58.68	11.38	15.48	-4.10

See notes on last page

Table 4. Comparison of June 14 and 15, 2005, Vertical Hydraulic Gradients to Model Predicted Gradients, Northrop Grumman Systems Corporation, Bethpage, New York.

Well Pair ID	Well Screen Midpoint Elevation (ft msl)	Water-Level Elevation (ft msl)	Vertical Gradient [2] (ft/ft) * 10^3	Model-Predicted, OU2 Steady-State Vertical Gradient (ft/ft) * 10^3	Increase Compared to Model-Predicted, Steady-State Vertical Gradient
Deep-Deep 2 Wells					
GM-15D	-227.34	62.25			
GM-15D2	-436.41	59.41	13.58	14.19	-0.61
GM-18D	-186.12	62.78			
GM-33D2	-403.15	56.68	28.11	12.30	15.81
GM-36D	-117.37	55.48			
GM-36D2	-443.40	51.20	13.13	2.75	10.38
GM-37D	-154.74	57.18			
GM-37D2	-282.83	55.89	10.07	3.88	6.19
GM-38D	-238.25	51.59			
GM-38D2	-393.44	47.36	27.26	6.08	21.18
GM-39D_A [1]	-169.77	62.77			
GM-39D_B [1]	-312.92	59.51	22.77	13.46	9.31
GM-73D	-301.13	60.08			
GM-73D2	-437.38	57.69	17.54	18.78	-1.24
GM-74D	-192.57	61.60			
GM-74D2	-444.64	54.67	27.49	28.26	-0.77
N-10627	-198.80	60.66			
GM-75D2	-421.37	57.04	16.26	2.25	14.01

(1) Wells GM-39_A and GM-39_B are screened at the approximate midpoint and basal portion of the deep zone, respectively.
ft msl feet relative to mean sea level

(2) Vertical hydraulic gradients are calculated as follows:

$$\frac{(\text{Water-Level Elevation}_1 - \text{Water-Level Elevation}_2)}{(\text{Screen Midpoint Elevation}_1 - \text{Screen Midpoint Elevation}_2)}$$

$_1$ - Shallower well of pairing
$_2$ - Deeper well of pairing
A positive "+" gradient value indicates a downward hydraulic gradient.
A negative "-" gradient value indicates an upward hydraulic gradient.

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Table 5. Summary of Total Volatile Organic Compound and Cadmium/Chromium Concentrations and Comparison to SCGs for Select Site Boundary Monitoring Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York. [1] [2]

Shallow Zone

Well Identification:	N-10631	GM-17SR	GM-18S	GM-21S	GM-78S	MW-3R
Second Quarter TVOC Concentration (ug/L):	0.6	ND	1	ND	1	0.8
No. of Second Quarter VOC SCG Exceedences	None	None	None	None	None	None
Second Quarter Total Cd Concentration (ug/L):	1.8	ND	ND	NS	ND	23.7
Second Quarter Total Cd SCG Exceedences:	None	None	None	--	None	1
Second Quarter Total Cr Concentration (ug/L):	23.4	ND	4.3	NS	ND	44.6
Second Quarter Total Cr SCG Exceedences:	None	None	None	--	None	None

Intermediate Zone

Well Identification:	GM-17I	GM-18I	GM-20I	GM-21I	GM-74I	GM-78I	GM-79I
Second Quarter TVOC Concentration (ug/L):	ND	0.7	0.6	ND	ND	2	ND
No. Second Quarter VOC SCG Exceedences:	None	None	None	None	None	None	None
Second Quarter Total Cd Concentration (ug/L):	NS	NS	NS	NS	NS	ND	NS
Second Quarter Total Cd SCG Exceedences:	--	--	--	--	--	None	--
Second Quarter Total Cr Concentration (ug/L):	NS	NS	NS	NS	NS	1.9	NS
Second Quarter Total Cr SCG Exceedences:	--	--	--	--	--	None	--

Deep Zone

Well Identification:	GM-17D	GM-18D	GM-20D	GM-21D
Second Quarter TVOC Concentration (ug/L):	ND	9	ND	2
No. Second Quarter VOC SCG Exceedences:	None	1	None	None

(1) Wells are shown on Figure 1. VOC analytical results from shallow, intermediate, and deep wells are provided in Tables 6 through 8, respectively; Cr and Cd analytical results for shallow and intermediate wells are provided in Table 11.

(2) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller, Inc. 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

VOC Volatile Organic Compound
NS Not Sampled
ND Not Detected
-- Not Applicable
Cd Cadmium
Cr Chromium
TVOC Total Volatile Organic Compound

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Table 6. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	10631 / N-10631 / 6/8/2005	GM-15S / GM-15S / 5/31/2005	GM-17SR / GM-17SR / 6/3/2005	GM-18S / GM-18S / 6/8/2005	GM-21S / GM-21S / 6/6/2005
Chloromethane	5		<5	<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2
Chloroethane	5		<5	<5	<5	<5	<5
Methylene chloride	5		<5	<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5	<5
1,1-Dichloroethene	5		<5	<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	5		<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5
Chloroform	7		<5	<5	<5	**1 J**	<5
1,2-Dichloroethane	5		<5	<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Trichloroethene	5		**0.6 J**	**2 J**	<5	<5	<5
Dibromochloromethane	5		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10	<10
Tetrachloroethene	5		<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5	<5
Freon-113 *	5		<5	<5	<5	<5	<5
Total VOCs			**0.6**	**2**	**0**	**1**	**0**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGS (NYSDEC 1998); most stringent value listed.

VOCs Volatile organic compounds

ug/L Micrograms per liter

J Estimated value

NYSDEC New York State Department of Environmental Conservation

* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.

NE No SCG established

TOGS Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

Table 6. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-78S 78 S 6/1/2005	MW-03R MW-3R 6/3/2005
Chloromethane	5		<5	<5
Bromomethane	5		<5	<5
Vinyl Chloride	2		<2	<2
Chloroethane	5		<5	<5
Methylene chloride	5		<5	<5
Acetone	50		<10	<10
Carbon disulfide	50		<5	<5
1,1-Dichloroethene	5		<5	<5
1,1-Dichloroethane	5		<5	<5
cis-1,2-Dichloroethene	5		<5	<5
trans-1,2-Dichloroethene	5		<5	<5
Chloroform	7		<5	<5
1,2-Dichloroethane	5		<5	<5
2-Butanone	50		<10	<10
1,1,1-Trichloroethane	5		<5	<5
Carbon tetrachloride	5		<5	<5
Bromodichloromethane	50		<5	<5
1,2-Dichloropropane	5		<5	<5
cis-1,3-Dichloropropene	5		<5	<5
Trichloroethene	5		**1 J**	**0.8 J**
Dibromochloromethane	5		<5	<5
1,1,2-Trichloroethane	5		<5	<5
Benzene	0.7		<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5
Bromoform	50		<5	<5
4-Methyl-2-pentanone	50		<10	<10
2-Hexanone	50		<10	<10
Tetrachloroethene	5		<5	<5
1,1,2,2-Tetrachloroethane	5		<5	<5
Toluene	5		<5	<5
Chlorobenzene	5		<5	<5
Ethylbenzene	5		<5	<5
Styrene	5		<5	<5
Xylene (total)	5		<5	<5
Vinyl Acetate	NE		<5	<5
Freon-113 *	5		<5	<5
Total VOCs			**1**	**0.8**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGS (NYSDEC 1998); most stringent value listed.

VOCs Volatile organic compounds

ug/L Micrograms per liter

J Estimated value

NYSDEC New York State Department of Environmental Conservation

* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.

NE No SCG established

TOGS Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

Table 7. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-15I GM-15I 6/10/2005	GM-17I GM 17I 6/7/2005	GM-18I GM18I 6/8/2005	GM-20I GM-20I 6/10/2005	GM-21I GM-21I 6/10/2005
Chloromethane	5		<5	<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2
Chloroethane	5		<5	<5	<5	<5	<5
Methylene chloride	5		<5	<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5	<5
1,1-Dichloroethene	5		<5	<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	5		<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5
Chloroform	7		<5	<5	**0.7 J**	<5	<5
1,2-Dichloroethane	5		<5	<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Trichloroethene	5		**5**	<5	<5	**0.6 J**	<5
Dibromochloromethane	5		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10	<10
Tetrachloroethene	5		<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5	<5
Freon-113 *	5		<5	<5	<5	<5	<5
Total VOCs			**5**	**0**	**0.7**	**0.6**	**0**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGS (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
NE No SCG established
TOGS Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

Table 7. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-74I GM 74I 6/2/2005	GM-78I 78 I 6/1/2005	GM-79I GM-79I 6/7/2005
Chloromethane	5		<5	<5	<5
Bromomethane	5		<5	<5	<5
Vinyl Chloride	2		<2	<2	<2
Chloroethane	5		<5	<5	<5
Methylene chloride	5		<5	<5	<5
Acetone	50		<10	<10	<10
Carbon disulfide	50		<5	<5	<5
1,1-Dichloroethene	5		<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5
cis-1,2-Dichloroethene	5		<5	<5	<5
trans-1,2-Dichloroethene	5		<5	<5	<5
Chloroform	7		<5	<5	<5
1,2-Dichloroethane	5		<5	<5	<5
2-Butanone	50		<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5
Bromodichloromethane	50		<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5
Trichloroethene	5		<5	**2 J**	<5
Dibromochloromethane	5		<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5
Bromoform	50		<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10
2-Hexanone	50		<10	<10	<10
Tetrachloroethene	5		<5	<5	<5
1,1,2,2-Tetrachloroethane	5		<5	<5	<5
Toluene	5		<5	<5	<5
Chlorobenzene	5		<5	<5	<5
Ethylbenzene	5		<5	<5	<5
Styrene	5		<5	<5	<5
Xylene (total)	5		<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5
Freon-113 *	5		<5	<5	<5
Total VOCs			**0**	**2**	**0**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGS (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation

VOCs Volatile organic compounds

ug/L Micrograms per liter

J Estimated value

* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.

NE No SCG established

TOGS Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

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Table 8. Concentrations of Volatile Organic Compounds Detected in Deep Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-15D GM-15D 5/31/2005	GM-17D GM 17D 6/7/2005	GM-18D GM 18D 6/7/2005	GM-20D GM-20D 6/10/2005	GM-21D GM-21D 6/6/2005
Chloromethane	5		<5	<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2
Chloroethane	5		<5	<5	<5	<5	<5
Methylene chloride	5		<5	<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5	<5
1,1-Dichloroethene	5		**1 J**	<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	5		<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	5		**1 J**	<5	<5	<5	<5
Chloroform	7		<5	<5	<5	<5	<5
1,2-Dichloroethane	5		<5	<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Trichloroethene	5		**3 J**	<5	**9**	<5	**2 J**
Dibromochloromethane	5		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10	<10
Tetrachloroethene	5		**3 J**	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5	<5
Freon-113 *	5		<5	<5	<5	<5	<5
Total VOCs			**8**	**0**	**9**	**0**	**2**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

(2) Wells GM-39D$_A$ and GM-39D$_B$ are screened in the upper and basal portions of the deep zone, respectively.

NYSDEC New York State Department of Environmental Conservation

VOCs Volatile organic compounds

ug/L Micrograms per liter

J Estimated value

D Constituent identified at a secondary dilution.

* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.

[ ] Value exceeds associated SCG value.

NE No SCG established

TOGS Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

Table 8. Concentrations of Volatile Organic Compounds Detected in Deep Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-34D GM-34D 6/9/2005	GM-39D$_A$[2] GM-39D 6/3/2005	GM-39D$_B$[2] GM-39D-2 6/7/2005	GM-73D GM73D 6/2/2005	GM-73D REP060205 6/2/2005
Chloromethane	5		<5	<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2
Chloroethane	5		<5	<5	<5	<5	<5
Methylene chloride	5		<5	<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5	<5
1,1-Dichloroethene	5		**5**	<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	5		**9**	<5	<5	<5	<5
trans-1,2-Dichloroethene	5		**4 J**	<5	<5	<5	<5
Chloroform	7		<5	<5	<5	<5	<5
1,2-Dichloroethane	5		<5	<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Trichloroethene	5		**590 D**	**7**	**23**	**74**	**75**
Dibromochloromethane	5		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10	<10
Tetrachloroethene	5		**8**	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5	<5
Freon-113 *	5		**28**	<5	<5	<5	<5
Total VOCs			**644**	**7**	**23**	**74**	**75**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

(2) Wells GM-39D$_A$ and GM-39D$_B$ are screened in the upper and basal portions of the deep zone, respectively.

NYSDEC New York State Department of Environmental Conservation

VOCs Volatile organic compounds

ug/L Micrograms per liter

J Estimated value

D Constituent identified at a secondary dilution.

* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.

Value exceeds associated SCG value.

NE No SCG established

TOGS Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

Table 8. Concentrations of Volatile Organic Compounds Detected in Deep Wells, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-74D / GM 74D / 6/2/2005	GM-79D / GM-79D / 6/7/2005
Chloromethane	5		<5	<5
Bromomethane	5		<5	<5
Vinyl Chloride	2		<2	<2
Chloroethane	5		<5	<5
Methylene chloride	5		<5	<5
Acetone	50		<10	<10
Carbon disulfide	50		<5	<5
1,1-Dichloroethene	5		<5	<5
1,1-Dichloroethane	5		<5	<5
cis-1,2-Dichloroethene	5		<5	**0.8 J**
trans-1,2-Dichloroethene	5		<5	<5
Chloroform	7		<5	<5
1,2-Dichloroethane	5		<5	<5
2-Butanone	50		<10	<10
1,1,1-Trichloroethane	5		<5	<5
Carbon tetrachloride	5		<5	<5
Bromodichloromethane	50		<5	<5
1,2-Dichloropropane	5		<5	<5
cis-1,3-Dichloropropene	5		<5	<5
Trichloroethene	5		**4 J**	**79**
Dibromochloromethane	5		<5	<5
1,1,2-Trichloroethane	5		<5	<5
Benzene	0.7		<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5
Bromoform	50		<5	<5
4-Methyl-2-pentanone	50		<10	<10
2-Hexanone	50		<10	<10
Tetrachloroethene	5		<5	**2 J**
1,1,2,2-Tetrachloroethane	5		<5	<5
Toluene	5		<5	<5
Chlorobenzene	5		<5	<5
Ethylbenzene	5		<5	<5
Styrene	5		<5	<5
Xylene (total)	5		<5	<5
Vinyl Acetate	NE		<5	<5
Freon-113 *	5		<5	**1 J**
Total VOCs			**4**	**82.8**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.
(2) Wells GM-39D_A and GM-39D_B are screened in the upper and basal portions of the deep zone, respectively.
NYSDEC New York State Department of Environmental Conservation
VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
D Constituent identified at a secondary dilution.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
Value exceeds associated SCG value.
NE No SCG established
TOGS Technical and Operational Guidance Series memorandum.
Bold value indicates a detection.

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Table 9. Concentrations of Volatile Organic Compounds Detected in Deep2 Wells and OU2 Groundwater Remedial Treatment Systems, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-15D2 GM-15D-2 5/31/2005	GM-33D2 GM-33D2 6/8/2005	GM-34D2 GM-34D2 6/9/2005	GM-35D2 GM-35D2 6/13/2005	GM-73D2 GM73D2 6/3/2005
Chloromethane	5		<5	<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2
Chloroethane	5		<5	<5	<5	<5	<5
Methylene chloride	5		<5	<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5	<5
1,1-Dichloroethene	5		<5	<5	**8**	**1 J**	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	5		<5	<5	**8**	**3 J**	<5
trans-1,2-Dichloroethene	5		<5	<5	**7**	<5	<5
Chloroform	7		<5	<5	<5	<5	<5
1,2-Dichloroethane	5		<5	<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Trichloroethene	5		**13**	**44**	**370 D**	**320 D**	**260 D**
Dibromochloromethane	5		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10	<10
Tetrachloroethene	5		**18**	**6**	**9**	**9**	**0.9 J**
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5	<5
Freon-113 *	5		**1 J**	**3 J**	**13**	**9**	<5
Total VOCs			**32**	**53**	**415**	**342**	**260.9**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
D Constituent identified at a secondary dilution.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
REP Replicate sample
[ ] Value exceeds associated SCG value.
NE No SCG established
TOGS Technical and Operational Guidance Series memorandum.
Bold value indicates a detection.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep2 Wells and OU2 Groundwater Remedial Treatment Systems, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL:	GM-74D2	GM-75D2	GM-75D2	GP-1	GP-3
		SAMPLE ID:	GM 74D2	GM-75D2	REP060905	GP 1/3 WELL 1	GP 1/3 WELL 3
		DATE:	6/2/2005	6/9/2005	6/9/2005	6/15/2005	6/15/2005
Chloromethane	5		<5	<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	**140**
Chloroethane	5		<5	<5	<5	<5	**3 J**
Methylene chloride	5		<5	<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5	<5
1,1-Dichloroethene	5		<5	**6**	**6**	**5 J**	**21**
1,1-Dichloroethane	5		<5	<5	<5	<5	**4 J**
cis-1,2-Dichloroethene	5		<5	**1 J**	**1 J**	**8**	**15**
trans-1,2-Dichloroethene	5		<5	**5 J**	**5 J**	<5	<5
Chloroform	7		<5	<5	<5	<5	<5
1,2-Dichloroethane	5		<5	<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5	**5**
Carbon tetrachloride	5		<5	<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Trichloroethene	5		**9**	**320 D J**	**400 D J**	**540 D**	**2500 D**
Dibromochloromethane	5		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10	<10
Tetrachloroethene	5		**8**	**6**	**5**	**130**	**57**
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5	<5
Freon-113 *	5		<5	**3 J**	**3 J**	**8**	**25**
Total VOCs			**17**	**341**	**420**	**691**	**2770**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
D Constituent identified at a secondary dilution.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
REP Replicate sample
[ ] Value exceeds associated SCG value.
NE No SCG established
TOGS Technical and Operational Guidance Series memorandum.
Bold value indicates a detection.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep2 Wells and OU2 Groundwater Remedial Treatment Systems, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	ONCT-1 ONCT 1 WELL 17 6/15/2005	ONCT-2 ONCT 2 WELL 18 6/15/2005	ONCT-3 ONCT 3 WELL 19 6/15/2005	EFFL GP 1/3 TOWER EF 6/15/2005
Chloromethane	5		<5	<5	<5	<5
Bromomethane	5		<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2
Chloroethane	5		<5	<5	<5	<5
Methylene chloride	5		<5	<5	<5	<5
Acetone	50		<10	<10	<10	<10
Carbon disulfide	50		<5	<5	<5	<5
1,1-Dichloroethene	5		**2 J**	**3 J**	**1 J**	<5
1,1-Dichloroethane	5		<5	<5	<5	<5
cis-1,2-Dichloroethene	5		**2 J**	**1 J**	**19**	<5
trans-1,2-Dichloroethene	5		<5	<5	**1 J**	<5
Chloroform	7		<5	<5	**1 J**	<5
1,2-Dichloroethane	5		<5	<5	<5	<5
2-Butanone	50		<10	<10	<10	<10
1,1,1-Trichloroethane	5		<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5
Bromodichloromethane	50		<5	<5	<5	<5
1,2-Dichloropropane	5		<5	<5	<5	<5
cis-1,3-Dichloropropene	5		<5	<5	<5	<5
Trichloroethene	5		**450 D**	**140**	**96**	**4 J**
Dibromochloromethane	5		<5	<5	<5	<5
1,1,2-Trichloroethane	5		<5	<5	<5	<5
Benzene	0.7		<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene	5		<5	<5	<5	<5
Bromoform	50		<5	<5	<5	<5
4-Methyl-2-pentanone	50		<10	<10	<10	<10
2-Hexanone	50		<10	<10	<10	<10
Tetrachloroethene	5		**14**	**8**	**8**	<5
1,1,2,2-Tetrachloroethane	5		<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5
Chlorobenzene	5		<5	<5	<5	<5
Ethylbenzene	5		<5	<5	<5	<5
Styrene	5		<5	<5	<5	<5
Xylene (total)	5		<5	<5	<5	<5
Vinyl Acetate	NE		<5	<5	<5	<5
Freon-113 *	5		**7**	**1 J**	**0.7 J**	<5
Total VOCs			**475**	**153**	**126.7**	**4**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
D Constituent identified at a secondary dilution.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
REP Replicate sample
[ ] Value exceeds associated SCG value.
NE No SCG established
TOGS Technical and Operational Guidance Series memorandum.
Bold value indicates a detection.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep2 Wells and OU2 Groundwater Remedial Treatment Systems, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	EFFL ONCT TOWER EFF. 6/15/2005
Chloromethane	5		<5
Bromomethane	5		<5
Vinyl Chloride	2		<2
Chloroethane	5		<5
Methylene chloride	5		<5
Acetone	50		<10
Carbon disulfide	50		<5
1,1-Dichloroethene	5		<5
1,1-Dichloroethane	5		<5
cis-1,2-Dichloroethene	5		<5
trans-1,2-Dichloroethene	5		<5
Chloroform	7		<5
1,2-Dichloroethane	5		<5
2-Butanone	50		<10
1,1,1-Trichloroethane	5		<5
Carbon tetrachloride	5		<5
Bromodichloromethane	50		<5
1,2-Dichloropropane	5		<5
cis-1,3-Dichloropropene	5		<5
Trichloroethene	5		**2 J**
Dibromochloromethane	5		<5
1,1,2-Trichloroethane	5		<5
Benzene	0.7		<0.7
trans-1,3-Dichloropropene	5		<5
Bromoform	50		<5
4-Methyl-2-pentanone	50		<10
2-Hexanone	50		<10
Tetrachloroethene	5		<5
1,1,2,2-Tetrachloroethane	5		<5
Toluene	5		<5
Chlorobenzene	5		<5
Ethylbenzene	5		<5
Styrene	5		<5
Xylene (total)	5		<5
Vinyl Acetate	NE		<5
Freon-113 *	5		<5
Total VOCs			**2**

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
D Constituent identified at a secondary dilution.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
REP Replicate sample
[ ] Value exceeds associated SCG value.
NE No SCG established
TOGS Technical and Operational Guidance Series memorandum.
Bold value indicates a detection.

Table 10. Concentrations of Site-Related Volatile Organic Compounds Detected in Outpost Wells and Associated Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York. [1]

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[2]	WELL: / SAMPLE ID: / DATE:	OW 1-1[4] BPOW 1-1 6/14/2005	OW 1-2[4] BPOW 1-2 6/14/2005	OW 1-3[4] BPOW 1-3 6/14/2005	OW 2-1[5,6] BPOW 2-1 6/15/2005	OW 2-2[5] BPOW 2-2 6/15/2005	OW 3-1 BPOW 3-1 6/16/2005	OW 3-2[7] BPOW 3-2 6/16/2005	OW3-2 REP061605 6/16/2005	OW 4-1 BPOW 4-1 6/17/2005	OW 4-2 BPOW 4-2 6/17/2005
Chlorobenzene	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	5		**1.1**	<0.5	**0.64**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	5		**1.1**	<0.5	**0.69**	**2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	7		<0.5	<0.5	<0.5	**0.53**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	5		<0.5	<0.5	<0.5	**3.3**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	5		**2.4**	<0.5	**1.6**	**0.81**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	5		**0.78**	<0.5	<0.5	**2.4**	**0.55**	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	5		<0.5	<0.5	<0.5	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Freon-113 *	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Site-Related VOCs:			**5.38**	**0**	**2.93**	**10.24**	**0.55**	**0**	**0**	**0**	**0**	**0**
TVOC Trigger Value:[3]			**0.6**	**0.6**	**0.6**	**1.5**	**1.5**	**1.5**	**1.5**	**--**	**1.5**	**1.5**

Footnotes:

(1) Site-related VOCs were established in the Public Water Supply Contingency Plan (ARCADIS G&M, Inc. 2003b).

(2) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

(3) TVOC trigger values were established in the PWSCP (ARCADIS G&M, Inc. 2003b).

(4) The TVOC trigger value for Cluster OW-1 was initially exceeded on April 23, 2004; confirmatory sampling and reporting was conducted as per the PWSCP (ARCADIS G&M, Inc. 2003b).

(5) The TVOC trigger value for Cluster OW-2 was initially exceeded on May 3, 2004; confirmatory sampling and reporting was conducted as per the PWSCP (ARCADIS G&M, Inc. 2003b).

(6) Benzene was detected in Outpost Well OW 2-1 on 06/15/2005 at a concentration of 180 ug/L, which exceeds the SCG criterion of 0.7 ug/L; Methyl tert-butyl ether (MTBE) was detected at a concentration of 17 ug/L, which exceeds the SCG criterion of 10 ug/L.

(7) 1,2,3-Trichlorobenzene was detected in Outpost Well OW 3-2 on 06/16/2005 at a concentration of 2.8 ug/L, below the SCG criterion of 5 ug/L.

General Notes:

- Samples analyzed and reported as a NYSDEC Category A deliverable per the NYS DER-10 Guidance Document (NYSDEC 2002).
- Samples analyzed by EPA Method 502.2, as specified in the NYSDEC OU2 Record of Decision.
- Results were validated by ARCADIS by following the contract laboratory program national functional guidelines for organic data review (USEPA 1999).

Definitions:

OU2	Operable Unit 2
VOCs	Volatile organic compounds
ug/L	Micrograms per liter
NYSDEC	New York State Department of Environmental Conservation
*	Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
TOGS	Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

Table 10. Concentrations of Site-Related Volatile Organic Compounds Detected in Outpost Wells and Associated Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York. (1)

CONSTITUENT (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values(2)	WELL:	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK
		SAMPLE ID:	TB061405	TB061505	TB061605	TB061705
		DATE:	6/14/2005	6/15/2005	6/16/2005	6/17/2005
Chlorobenzene	5		<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	5		<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	5		<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	5		<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	5		<0.5	<0.5	<0.5	<0.5
Chloroform	7		<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	5		<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	5		<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	5		<0.5	<0.5	<0.5	<0.5
Trichloroethene	5		<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	5		<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	5		<0.5	<0.5	<0.5	<0.5
Freon-113 *	5		<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	5		<0.5	<0.5	<0.5	<0.5
Total Site-Related VOCs:			**0**	**0**	**0**	**0**
TVOC Trigger Value:(3)			--	--	--	--

Footnotes:

(1) Site-related VOCs were established in the Public Water Supply Contingency Plan (ARCADIS G&M, Inc. 2003b).

(2) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

(3) TVOC trigger values were established in the PWSCP (ARCADIS G&M, Inc. 2003b).

(4) The TVOC trigger value for Cluster OW-1 was initially exceeded on April 23, 2004; confirmatory sampling and reporting was conducted as per the PWSCP (ARCADIS G&M, Inc. 2003b).

(5) The TVOC trigger value for Cluster OW-2 was initially exceeded on May 3, 2004; confirmatory sampling and reporting was conducted as per the PWSCP (ARCADIS G&M, Inc. 2003b).

(6) Benzene was detected in Outpost Well OW 2-1 on 06/15/2005 at a concentration of 180 ug/L, which exceeds the SCG criterion of 0.7 ug/L; Methyl tert-butyl ether (MTBE) was detected at a concentration of 17 ug/L, which exceeds the SCG criterion of 10 ug/L.

(7) 1,2,3-Trichlorobenzene was detected in Outpost Well OW 3-2 on 06/16/2005 at a concentration of 2.8 ug/L, below the SCG criterion of 5 ug/L.

General Notes:

- Samples analyzed and reported as a NYSDEC Category A deliverable per the NYS DER-10 Guidance Document (NYSDEC 2002).
- Samples analyzed by EPA Method 502.2, as specified in the NYSDEC OU2 Record of Decision.
- Results were validated by ARCADIS by following the contract laboratory program national functional guidelines for organic data review (USEPA 1999).

Definitions:

OU2	Operable Unit 2
VOCs	Volatile organic compounds
ug/L	Micrograms per liter
NYSDEC	New York State Department of Environmental Conservation
*	Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
TOGS	Technical and Operational Guidance Series memorandum.

Bold value indicates a detection.

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Table 11. Concentrations of Total and Dissolved Cadmium and Chromium Detected in Groundwater and Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC SCGs [1]	WELL: / SAMPLE ID: / DATE:	10631 N-10631 6/8/2005	GM-15S GM-15S 5/31/2005	GM-17SR GM-17SR 6/3/2005	GM-18S GM-18S 6/8/2005	GM-78S 78 S 6/1/2005	GM-78I 78 I 6/1/2005	MW-03R MW-3R 6/3/2005	MW-04 PT1MW-04 6/1/2005	MW-05 PT1MW-05 6/1/2005	MW-06 PT1MW-06 6/1/2005
Cadmium	5		**1.8 B**	--	<10	<10	<10	<10	**23.7**	--	--	--
Cadmium (Dissolved)	5		**1.4 B**	--	<10	<10	--	--	**23.4**	--	--	--
Chromium	50		**23.4**	**404**	<10	**4.3 B**	<10	**1.9 B**	**44.6**	**2.2 B**	**1270**	**272**
Chromium (Dissolved)	50		**18.5**	--	<10	**1.5 B**	--	--	**44.6**	--	--	--

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
ug/L Micrograms per liter
B Detected between the IDL and CRDL
IDL Instrument detection limit
CRDL Contract-required detection limit
EQ Equipment
Value exceeds associated SCG value.
TOGS Technical and Operational Guidance Series memorandum.
Bold Constituent detected above IDL.
-- Not analyzed

Table 11. Concentrations of Total and Dissolved Cadmium and Chromium Detected in Groundwater and Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	NYSDEC SCGs [1]	WELL: SAMPLE ID: DATE:	WATER EQ. BLANK FB053105 5/31/2005	WATER EQ. BLANK FB060105 6/1/2005	WATER EQ. BLANK FB060305 6/3/2005	WATER EQ. BLANK FB060805 6/8/2005
Cadmium	5		--	<10	<10	<10
Cadmium (Dissolved)	5		--	--	--	--
Chromium	50		<10	<10	<10	<10
Chromium (Dissolved)	50		--	--	--	--

(1) Standards, Criteria, and Guidance (SCG) values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000) that are based on the NYSDEC TOGSs (NYSDEC 1998); most stringent value listed.

NYSDEC New York State Department of Environmental Conservation
ug/L Micrograms per liter
B Detected between the IDL and CRDL
IDL Instrument detection limit
CRDL Contract-required detection limit
EQ Equipment
Value exceeds associated SCG value.
TOGS Technical and Operational Guidance Series memorandum.
Bold Constituent detected above IDL.
-- Not analyzed

Table 12. Concentrations of Tentatively Identified Compounds (TICs) Detected in Groundwater Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

WELL IDENTIFICATION (Units in ug/L)	SAMPLE ID	DATE	Unknown	Isobutylene	Tetrahydrofuran
GM-17I	GM 17I	6/7/2005	34 J	--	--
GP-3	GP.1/3 WELL 3	6/15/2005	--	7 NJ	14 NJ

TICs are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds.

ug/L Micrograms per liter

-- Not Detected

N Presumptive evidence of this constituent. Calibrations were not run for these constituents; therefore, the results should be used for qualitative purposes only.

J Estimated value

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Table 13. Concentrations of Volatile Organic Compounds Detected in Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	SAMPLE TYPE: / SAMPLE ID: / DATE:	TRIP BLANK TB053105 5/31/2005	TRIP BLANK TB060105 6/1/2005	TRIP BLANK TB060205 6/2/2005	TRIP BLANK TB060305 6/3/2005	TRIP BLANK TB060605 6/6/2005	TRIP BLANK TB060705 6/7/2005
Chloromethane		<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5
Vinyl Chloride		<2	<2	<2	<2	<2	<2
Chloroethane		<5	<5	<5	<5	<5	<5
Methylene chloride		**2 J**	**2 J**	**1 J B**	**2 J B**	**1 J B**	**1 J**
Acetone		<10	<10	<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene		<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5
Trichloroethene		<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10	<10	<10
Tetrachloroethene		<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5
Toluene		<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5
Freon-113 *		<5	<5	<5	<5	<5	<5
Total VOCs		**2**	**2**	**1**	**2**	**1**	**1**

VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
B Detected in an associated method blank.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
Bold value indicates a detection.

Table 13. Concentrations of Volatile Organic Compounds Detected in Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

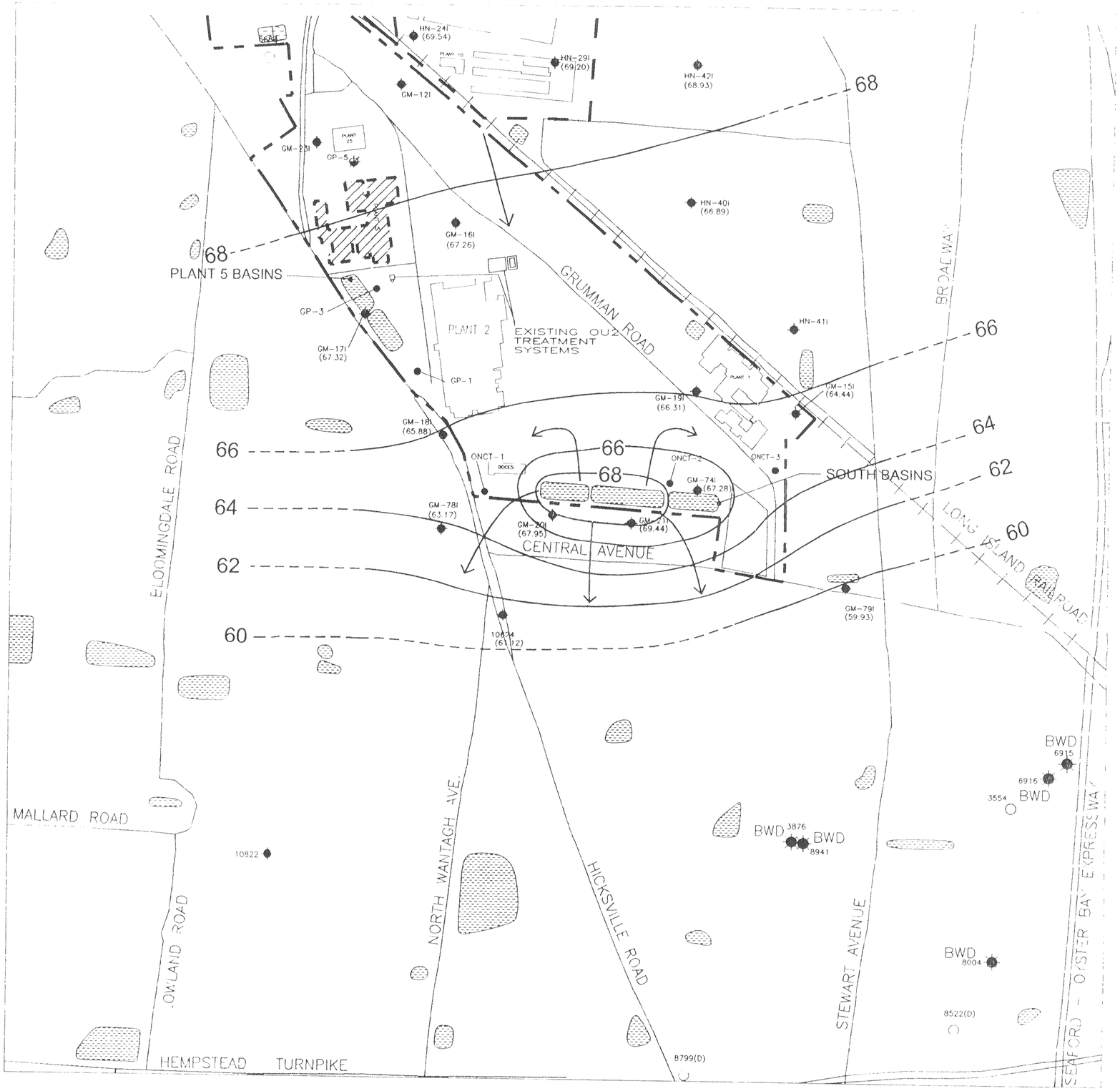
CONSTITUENT (Units in ug/L)	SAMPLE TYPE: / SAMPLE ID: / DATE:	TRIP BLANK TB060805 6/8/2005	TRIP BLANK TB060905 6/9/2005	TRIP BLANK TB061005 6/10/2005	TRIP BLANK TB061305 6/13/2005	TRIP BLANK TB061505 6/15/2005	FIELD BLANK FB053105 5/31/2005
Chloromethane		<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5
Vinyl Chloride		<2	<2	<2	<2	<2	<2
Chloroethane		<5	<5	<5	<5	<5	<5
Methylene chloride		<5	**1 J B**	**2 J B**	<5	**2 J B**	**2 J**
Acetone		<10	<10	<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene		<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5
Trichloroethene		<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10	<10	<10
Tetrachloroethene		<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5
Toluene		<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5
Freon-113 *		<5	<5	<5	<5	<5	<5
Total VOCs		**0**	**1**	**2**	**0**	**2**	**2**

VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
B Detected in an associated method blank.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
Bold value indicates a detection.

Table 13. Concentrations of Volatile Organic Compounds Detected in Blank Samples, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT (Units in ug/L)	SAMPLE TYPE: / SAMPLE ID: / DATE:	FIELD BLANK FB060105 6/1/2005	FIELD BLANK FB060305 6/3/2005	FIELD BLANK FB060605 6/6/2005	FIELD BLANK FB060805 6/8/2005	FIELD BLANK FB060905 6/9/2005
Chloromethane		<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5
Vinyl Chloride		<2	<2	<2	<2	<2
Chloroethane		<5	<5	<5	<5	<5
Methylene chloride		**2 J**	<5	**2 J B**	**1 J**	**2 J B**
Acetone		<10	<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene		<5	<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5
Trichloroethene		<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10	<10
Tetrachloroethene		<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5
Toluene		<5	**0.8 J**	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5
Freon-113 *		<5	<5	<5	<5	<5
Total VOCs		**2**	**0.8**	**2**	**1**	**2**

VOCs Volatile organic compounds
ug/L Micrograms per liter
J Estimated value
B Detected in an associated method blank.
* Freon 113 also known as 1,1,1-Trichloro-2,2,2-trifluoroethane.
Bold value indicates a detection.



EXPLANATION

- PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION SITE
- PROPERTY BOUNDARY OF THE U.S. NAVY SITE
- RECHARGE BASIN
- GM-15I (64.44) LOCATION AND DESIGNATION OF INTERMEDIATE MONITORING WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL
- 3876 LOCATION AND DESIGNATION OF BETHPAGE WATER DISTRICT PUBLIC SUPPLY WELL (SHOWN FOR REFERENCE ONLY)
- 3554 LOCATION AND DESIGNATION OF ADDITIONAL WELL
- GP-5 LOCATION AND DESIGNATION OF GRUMMAN INDUSTRIAL SUPPLY WELL (SHOWN FOR REFERENCE ONLY)
- ONCT-1 LOCATION AND DESIGNATION OF ON-SITE OU2 REMEDIAL WELL (SHOWN FOR REFERENCE ONLY)
- HORIZONTAL COMPONENT OF GROUNDWATER FLOW
- -60- LINE OF EQUAL POTENTIOMETRIC SURFACE ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE APPROXIMATE)
- OU2 OPERABLE UNIT 2
- BWD BETHPAGE WATER DISTRICT
- USGS UNITED STATES GEOLOGICAL SURVEY
- AM ANOMALOUS MEASUREMENT
- NM NOT MEASURED

NOTES:

1. THIS FIGURE INCLUDES LOCATIONS OF MONITORING WELLS AND PUBLIC SUPPLY WELLS AS OF SEPTEMBER 25, 2001.
2. OU2 WELLS ONCT-1, ONCT-2, ONCT-3, GP-1 AND GP-3 ARE SCREENED IN THE D2 ZONE.
3. BWD WELL 3876 IS SCREENED IN THE DEEP ZONE.
4. BWD WELLS 6915, 6916, 8004, AND 8941 ARE SCREENED IN THE D2 ZONE.
5. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HICKSVILLE, AMITYVILLE, HUNTINGTON, AND FREEPORT QUADRANGLES), AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.

REV. ISSUED DATE DESCRIPTION

SEAL

ARCADIS
88 Duryea Road
Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
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PROJECT TITLE
OPERABLE UNIT 2
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGN PROF.	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		M. SAURBORN

SHEET TITLE
POTENTIOMETRIC SURFACE ELEVATION AND HORIZONTAL GROUNDWATER FLOW DIRECTIONS IN THE INTERMEDIATE ZONE JUNE 14 AND 15, 2005

TASK/PHASE NUMBER	DRAWN BY
00004	E. HUGHES
PROJECT NUMBER	DRAWING NUMBER
NY001348.0405	3

N

EXPLANATION

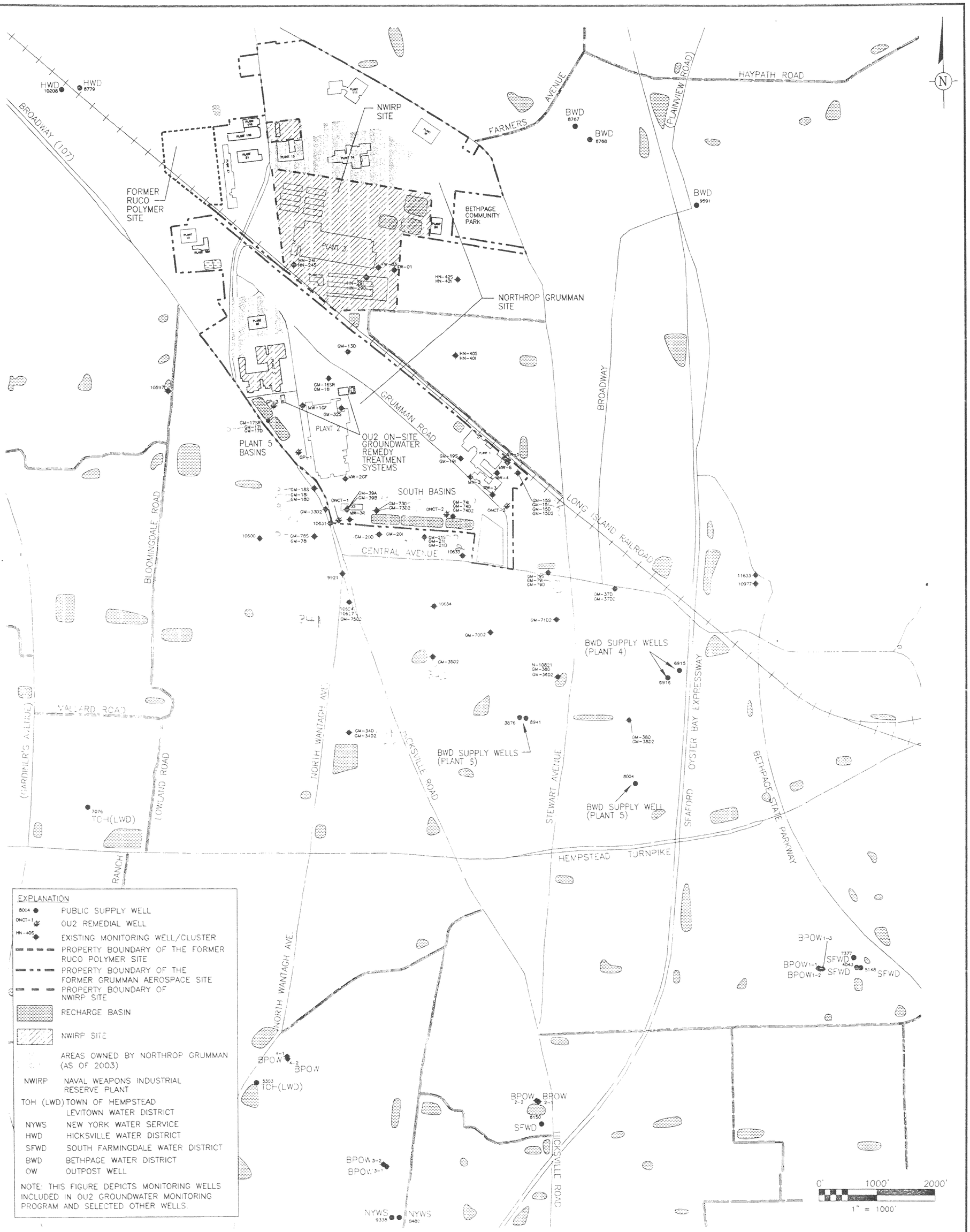
- PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION SITE
- PROPERTY BOUNDARY OF THE U.S. NAVY SITE
- RECHARGE BASIN
- GM-15S (64.36) — LOCATION AND DESIGNATION OF SHALLOW MONITORING WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL
- 3876 — LOCATION AND DESIGNATION OF BETHPAGE WATER DISTRICT PUBLIC SUPPLY WELL (SHOWN FOR REFERENCE ONLY)
- 7164 — LOCATION AND DESIGNATION OF ADDITIONAL WELL
- GP-5 — LOCATION AND DESIGNATION OF GRUMMAN INDUSTRIAL SUPPLY WELL (SHOWN FOR REFERENCE ONLY)
- ONCT-1 — LOCATION AND DESIGNATION OF ON-SITE OU2 REMEDIAL WELL (SHOWN FOR REFERENCE ONLY)
- HORIZONTAL COMPONENT OF GROUNDWATER FLOW
- -60- LINE OF EQUAL WATER LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE APPROXIMATE)

OU2 OPERABLE UNIT 2
BWD BETHPAGE WATER DISTRICT
USGS UNITED STATES GEOLOGICAL SURVEY
AM ANOMALOUS MEASUREMENT
NM NOT MEASURED

NOTES:

1. THIS FIGURE INCLUDES LOCATIONS OF MONITORING WELLS AND PUBLIC SUPPLY WELLS AS OF SEPTEMBER 25, 2001.
2. OU2 WELLS ONCT-1, ONCT-2, ONCT-3, GP-1 AND GP-3 ARE SCREENED IN THE D2 ZONE.
3. BWD WELL 3876 IS SCREENED IN THE DEEP ZONE.
4. BWD WELLS 6915, 6916, 8004, AND 8941 ARE SCREENED IN THE D2 ZONE.
5. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HICKSVILLE, AMITYVILLE, HUNTINGTON, AND FREEPORT QUADRANGLES), AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.

REV. ISSUED DATE DESCRIPTION	SEAL	ARCADIS 88 Duryea Road Melville, NY 11747 Tel: 631-249-7600 Fax: 631-249-7610 www.arcadis-us.com	PROJECT TITLE: OPERABLE UNIT 2 NORTHROP GRUMMAN CORPORATION BETHPAGE, NEW YORK	PROJECT MANAGER: C. SAN GIOVANNI; DEPARTMENT MANAGER: M. WOLFERT; LEAD DESIGN PROF.:	CHECKED BY: M. SAURBORN
			SHEET TITLE: WATER-TABLE CONFIGURATION AND HORIZONTAL GROUNDWATER FLOW DIRECTIONS IN THE SHALLOW ZONE JUNE 14 AND 15, 2005	TASK/PHASE NUMBER: 00004; PROJECT NUMBER: NY001348.0405	DRAWN BY: E. HUGHES; DRAWING NUMBER: 2



EXPLANATION

- 8004 ● PUBLIC SUPPLY WELL
- ONCT-1 ⊕ OU2 REMEDIAL WELL
- HN-40S ◆ EXISTING MONITORING WELL/CLUSTER
- PROPERTY BOUNDARY OF THE FORMER RUCO POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF NWIRP SITE
- RECHARGE BASIN
- NWIRP SITE
- AREAS OWNED BY NORTHROP GRUMMAN (AS OF 2003)

NWIRP	NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
TOH (LWD)	TOWN OF HEMPSTEAD LEVITOWN WATER DISTRICT
NYWS	NEW YORK WATER SERVICE
HWD	HICKSVILLE WATER DISTRICT
SFWD	SOUTH FARMINGDALE WATER DISTRICT
BWD	BETHPAGE WATER DISTRICT
OW	OUTPOST WELL

NOTE: THIS FIGURE DEPICTS MONITORING WELLS INCLUDED IN OU2 GROUNDWATER MONITORING PROGRAM AND SELECTED OTHER WELLS.

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PROJECT TITLE
OPERABLE UNIT 2
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGNER	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		M. SAURBORN

SHEET TITLE
LOCATION OF OU2 ON-SITE GROUNDWATER REMEDY AND WELLS

TASK/PHASE NUMBER	DRAWN BY
00004	E. HUGHES
PROJECT NUMBER	DRAWING NUMBER
NY001348.0405	1

Acad version : R16.2S (LMS tech)
User Name : ehughes
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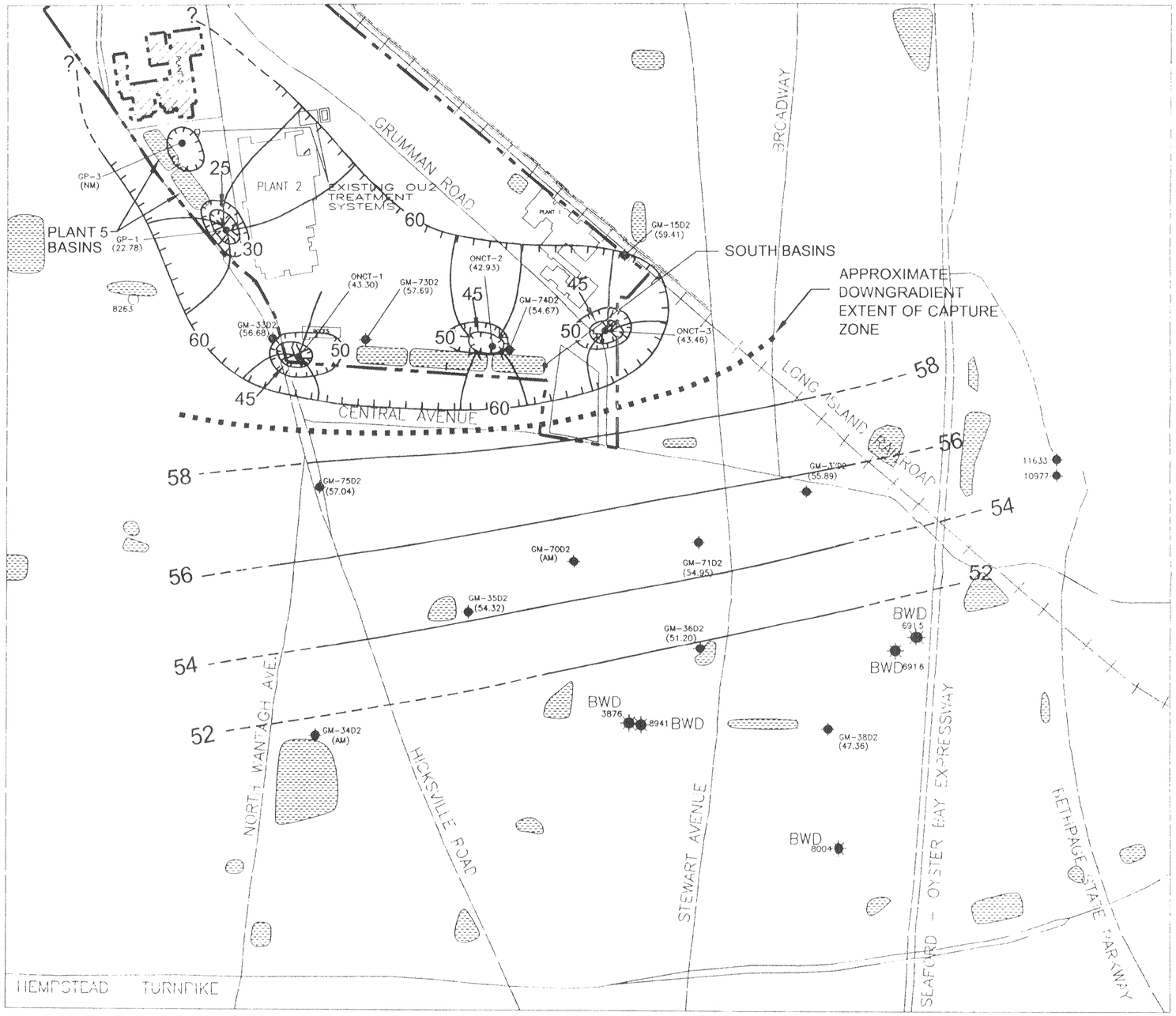

800 0 800 1600

SCALE: 1" = 800'

EXPLANATION

- PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION SITE
- RECHARGE BASIN
- GM-36D2 (51.20) — LOCATION AND DESIGNATION OF D2 (VERY DEEP) MONITORING WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL.
- 3876 — LOCATION AND DESIGNATION OF BETHPAGE WATER DISTRICT PUBLIC SUPPLY WELL
- 8263 — LOCATION AND DESIGNATION OF ADDITIONAL WELL
- ONCT-3 (43.46) — LOCATION AND DESIGNATION OF ON-SITE OU2 REMEDIAL WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL
- HORIZONTAL COMPONENT OF GROUNDWATER FLOW
- –60– LINE OF EQUAL POTENTIOMETRIC SURFACE ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE APPROXIMATE)
- LINE OF EQUAL POTENTIOMETRIC SURFACE ELEVATION DENOTING A DECREASE IN FEET RELATIVE TO MEAN SEA LEVEL

OU2 OPERABLE UNIT 2

GPM GALLONS PER MINUTE

BWD BETHPAGE WATER DISTRICT

USGS UNITED STATES GEOLOGICAL SURVEY

AM ANOMALOUS MEASUREMENT

NM NOT MEASURED

NOTES:

1. THIS FIGURE INCLUDES LOCATIONS OF MONITORING WELLS AND PUBLIC SUPPLY WELLS AS OF SEPTEMBER 25, 2001.
2. OU2 REMEDIAL WELLS GP-1, GP-3, ONCT-1, ONCT-2 AND ONCT-3 ARE SCREENED IN THE D2 ZONE. WELLS GP-1,GP-3, ONCT-1, ONCT-2 AND ONCT-3 WERE PUMPING AT 960 GPM, 520 GPM, 900 GPM, 800 GPM AND 680 GPM, RESPECTIVELY, AT THE TIME OF WATER LEVEL MEASUREMENT.
3. BWD WELL 3876 IS SCREENED IN THE DEEP ZONE.
4. BWD WELLS 6915, 6916, 8004, AND 8941 ARE SCREENED IN THE D2 ZONE.
5. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HICKSVILLE, AMITYVILLE, HUNTINGTON, AND FREEPORT QUADRANGLES), AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.

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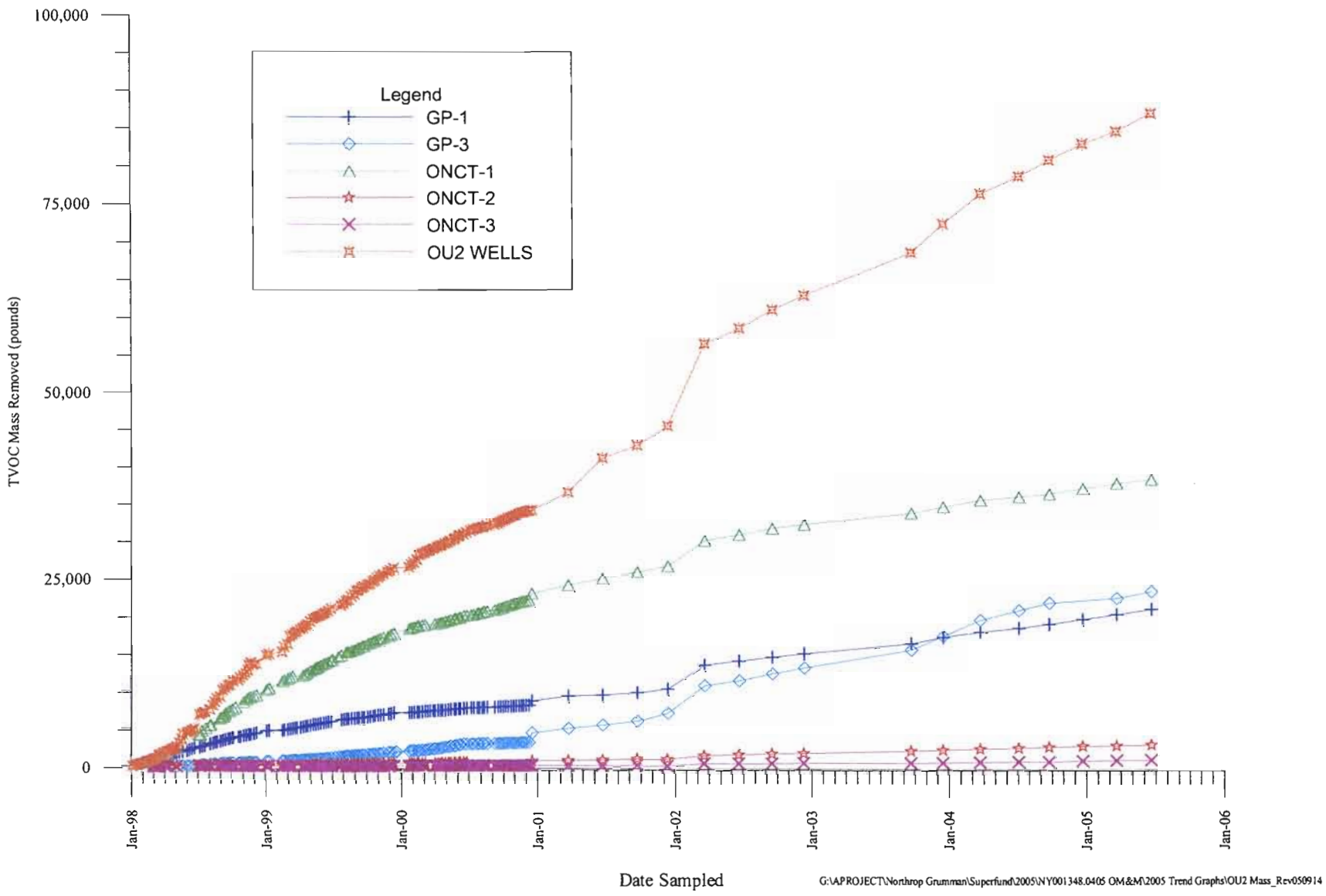
BETHPAGE, NEW YORK

PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGN PROF.	CHECKED BY
C. SAN GIOVANNI	M. WOLFERT		M. SAURBORN

SHEET TITLE
POTENTIOMETRIC SURFACE ELEVATION AND HORIZONTAL GROUNDWATER FLOW DIRECTIONS IN THE D2 ZONE JUNE 14 AND 15, 2005

TASK/PHASE NUMBER	DRAWN BY
00004	E. HUGHES
PROJECT NUMBER	DRAWING NUMBER
NY001348.0405	4



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Cumulative VOC Mass Removed by the OU2 Remedial Wells through Second Quarter 2005
Northrop Grumman Corporation, Bethpage, New York

FIGURE
5

ARCADIS

Appendix A

Water-Level Measurement Logs

42.39

Table 3. Water-Level Measurement Data, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

Well Identification G-14.05		Measuring Point Elevation (ft msl)		Depth to Water (ft bmp)	Water-Level Elevation (ft msl)	Pumping Rate GPM
Shallow Wells						
FW-03		124.30		~~56.38~~ 56.35		
N-9921		94.23		32.82		
N-10597		109.85		42.39		
N-10600		102.41		39.75		
N-10631		103.47		38.66		
N-10633		103.80		39.80		
N-10634		101.20		~~40.35~~ 40.35		
N-10821		91.58		34.92		
GM-15S		109.44		45.09		
GM-16SR		115.86		~~45.08~~ 48.55	MEASURED 6-15-05	
GM-17SR		115.79		48.39		
GM-18S		107.60		40.77		
GM-19S		109.86		42.25		
GM-21S		105.81		36.20		
GM-78S		104.94		41.58		
GM-79S (N-10628)		100.88		40.52		
HN-24S		NA		52.45		
HN-40S		116.35		41.19		
HN-42S		120.32		51.39		
MW-3R		101.45		34.92		
Intermediate Wells						
N-10624		93.61		32.49		
GM-15I		109.25		44.81		
GM-16I		115.81		48.55	MEASURED 6-15-05	
GM-17I		115.83		48.51		
GM-18I		109.03		~~43.05~~ 43.15		
GM-19I		109.86		43.55		
GM-20I		103.88		35.93		
GM-21I		105.72		36.28		
GM-74I		107.42		40.14		
GM-78I		105.06		41.89		
GM-79I		100.88		40.95		
HN-24I		125.80		56.26		
HN-29I		116.42		47.22		
HN-40I		115.91		49.07		
HN-42I		119.61		56.48		

See notes on last page

Table 3. Water-Level Measurement Data, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

Well Identification		Measuring Point Elevation (ft msl)		Depth to Water (ft bmp)	Water-Level Elevation (ft msl)	Pumping Rate GPM
Deep Wells						
N-10627		93.70		33.04		
GM-13D		113.97		46.82		
GM-15D		109.84		47.259		
GM-17D		115.68		50.71		
GM-18D		108.88		46.10		
GM-20D		103.92		38.60		
GM-21D		105.66		43.68		
GM-34D		71.19		18.20		
GM-36D		91.63		36.45		
GM-37D		97.26		40.08		
GM-38D		91.75		40.16		
GM-39D$_A$		102.23		39.46		
GM-39D$_B$		102.08		42.57		
GM-73D		104.87		44.79		
GM-74D		107.43		45.83		
GM-79D		101.25		42.57		
HN-29D		115.11		47.45		
Deep2 Wells						
GM-15D2		109.78		50.37		New Lock needed
GM-33D2		106.85		50.17		
GM-34D2		71.19		15.12		
GM-35D2		96.28		41.96		
GM-36D2		91.60		40.40		
GM-37D2		97.17		41.28		
GM-38D2		91.56		~~40.16~~ 44.20		
GM-70D2		99.58		42-20		
GM-71D2		98.45		43-50		
GM-73D2		104.62		46.93		
GM-74D2		107.36		52.69		
GM-75D2		93.63		36.59		
GP-1	120' airline	116.78		44.00		960
GP-3		NA		111.35		~~960~~ 520
ONCT-1	110' airline	104.10		49'120 = 60.80		
ONCT-2		110.00		67.07		800 GPM
ONCT-3		108.70		68.24		680

See notes on last page

47.45

Table 3. Water-Level Measurement Data, Second Quarter 2005, Northrop Grumman Corporation, Bethpage, New York.

Well Identification		Measuring Point Elevation (ft msl)		Depth to Water (ft bmp)	Water-Level Elevation (ft msl)	Pumping Rate GPM
Outpost Wells						
BPOW1-1		73.65		29.71		
BPOW1-2		73.54		33.92		
BPOW1-3		73.37		33.80		
BPOW2-1		60.06		22.54		
BPOW2-2		59.96		24.66		
BPOW3-1		63.19		29.20		
BPOW3-2		63.72		31.75		
BPOW4-1		67.34		32.54		
BPOW4-2		67.18		30.68		

ft msl feet relative to mean sea level
ft bmp feet below measuring point
NM Not Measured

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Appendix B

Groundwater Sampling Logs

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 5/31/05

Site/Well No.: GM-15S | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 73° | Sampling Time: Begin 4:00pm | End 4:04pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	80
Depth to Water (ft bmp)	44.77
Water-Level Elevation (ft)	—
Water Column in Well (ft)	35.23
Casing Diameter/Type	4" (0.65)
Gallons in Well	22.9 x 3 = 69
Gallons Pumped/Bailed Prior to Sampling	Q=2 T=34.5 V=12
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 3:24 end 4:00pm
Pumping Rate (gpm)	2
Evacuation Method	Rediflow Pump

Field Parameters

Time	I	1V	2V	3V
Color	Brown	colorless	colorless	colorless
Odor	slight	None	None	None
Appearance	Turbid	clear	clear	clear
pH (s.u.)	5.84	6.01	6.01	5.89
Conductivity ~~(mS/cm)~~	—	—	—	—
(µmhos/cm)	526.0	504	499	499
Turbidity (NTU)	—	7.42	5.40	4.28
Temperature (°C)	19.2	18.6	18.1	18.3
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~	3:24	3:36	3:48	4:00

Sampling Method: 3 well Volume

Remarks: PID reading at Wellhead Zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW / PB

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-10-05

Site/Well No.: GM-15I | Replicate No.: MS/MSD | Code No.: —

Weather: Breezy, Partly cloudy 77° | Sampling Time: Begin 5:54pm End 5:57pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	105
Depth to ~~Water~~ Packer (ft bmp)	94
Water-Level Elevation (ft)	—
Water Column in Well (ft)	11
Casing Diameter/Type	4" (0.65)
Gallons in Well	7.15 x3
Gallons Pumped/Bailed Prior to Sampling	22
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 4:45pm end 5:54pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated Bladder/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	Colorless	Colorless	Colorless	Colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	5.15	4.97	4.94	4.97
Conductivity (mS/cm)	—	—	—	—
(µmhos/cm)	297	281	287	281
Turbidity (NTU)	—	—	—	—
Temperature (°C)	17.8	18.7	19.1	18.3
Dissolved Oxygen (mg/L)	—	—	—	—
5 gallon container ~~Salinity (%)~~	—	½	½	½

Sampling Method: 3 well volume

Remarks: No turbidity meter. / = 5 gallon container

PID reading at well head zero | DTW = 44.8

94 − 44.84 x .43 + 50 = 75 PSI round up

Needs new lock

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: BP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-15D

Date: 5/31/05 Sampled By: PP

Sampling Time: 12:45pm Recorded By: PP

Weather: Mostly clear 73° Coded Replicate No.: N/A

Instrument Identification

Water Quality Meter(s): / Serial #: /

Purging Information

Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow

Casing Diameter: 4" Screen Interval (ft bmp): Top 332 Bottom 342

Sounded Depth (ft bmp): 342 Pump Intake Depth (ft bmp): 337

Depth to Water (ft bmp): 47.19 Purge time Start: 11:43 AM Finish: 12:45pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
11:45	–	–	–	20.3	4.30	163.3	237	3.39	–	–	–
11:50	–	–	–	20.7	4.34	163.1	243	3.26	–	47.18	–
11:55	–	–	–	21.3	4.38	162.9	245	3.29	–	–	–
12:00	–	–	–	21.7	4.40	162.7	248	3.09	–	47.19	–
12:05	–	–	–	22.0	4.42	161.8	252	3.06	–	–	–
12:10	–	–	–	22.2	4.41	160.3	257	3.35	–	47.19	–
12:15	–	–	–	22.3	4.44	159.9	260	3.13	–	–	–
12:20	–	–	–	22.3	4.46	159.3	263	3.04	–	47.19	–
12:25	–	–	–	22.4	4.50	158.7	264	3.04	–	–	–
12:30	–	–	–	22.4	4.50	158.5	266	3.24	–	47.19	–
12:35	–	–	–	22.5	4.50	158.3	267	3.22	–	–	–
12:40	–	–	–	22.6	4.52	158.3	268	3.07	–	47.19	–
12:45	–	–	–	22.8	4.52	158.2	271	3.11	–	–	–

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: Zero at wellhead

Comments: /

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ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-15D2

Date: 5/31/05 Sampled By: PP

Sampling Time: 2:10 pm Recorded By: PP

Weather: Partly cloudy 79° Coded Replicate No.: N/A

Instrument Identification

Water Quality Meter(s): — Serial #: —

Purging Information

Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow

Casing Diameter: 4" Screen Interval (ft bmp): Top 536 Bottom 556

Sounded Depth (ft bmp): 556 Pump Intake Depth (ft bmp): 546

Depth to Water (ft bmp): 49.83 Purge time Start: 1:08 pm Finish: 2:10 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:10	–	–	–	24.7	4.70	103.6	257	4.23	–	–	–
1:15	–	–	–	23.2	4.70	80.9	255	1.80	–	47.83	–
1:20	–	–	–	22.5	4.72	79.0	255	2.70	–	–	–
1:25	–	–	–	22.8	4.61	78.3	254	3.26	–	47.82	–
1:30	–	–	–	23.0	4.73	77.4	252	3.91	–	–	–
1:35	–	–	–	23.3	4.71	77.2	253	4.39	–	47.83	–
1:40	–	–	–	23.0	4.68	77.0	253	4.50	–	–	–
1:45	–	–	–	23.1	4.73	77.1	254	4.65	–	47.83	–
1:50	–	–	–	23.4	4.71	76.7	254	4.45	–	–	–
1:55	–	–	–	22.4	4.90	77.0	258	5.03	–	47.83	–
2:00	–	–	–	22.8	4.88	77.0	255	4.98	–	–	–
2:05	–	–	–	23.9	4.88	77.1	256	4.96	–	47.83	–
2:10	–	–	–	23.6	4.92	76.9	255	4.80	7.32	–	–

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: Zero at wellhead

Comments: —

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ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number:	NY001348.0405	Task:	00002	Well ID:	GM-17I
Date:	6/7/05	Sampled By:	PP		
Sampling Time:	11:40AM	Recorded By:	PP		
Weather:	Partly cloudy 82°	Coded Replicate No.:	N/A		

Instrument Identification

Water Quality Meter(s): / Serial #: /

Purging Information

Casing Material:	PVC	Purge Method:	Dedicated Bladder		
Casing Diameter:	4"	Screen Interval (ft bmp):	Top 100	Bottom	120
Sounded Depth (ft bmp):	120	Pump Intake Depth (ft bmp):	110		
Depth to Water (ft bmp):	48.98	Purge time Start:	10:40 AM	Finish:	11:40AM

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
10:40	—	—	—	18.1	5.78	158.7	222	9.37	—	—	—
10:45	—	—	—	17.7	5.83	127.7	216	9.20	—	48.98	—
10:50	—	—	—	18.7	5.83	121.7	216	8.25	—	—	—
10:55	—	—	—	19.6	5.81	120.0	219	8.41	—	48.98	—
11:00	—	—	—	19.9	5.91	117.9	213	8.14	—	—	—
11:05	—	—	—	19.9	5.88	117.7	215	8.03	—	48.98	—
11:10	—	—	—	20.0	5.91	118.1	213	8.06	—	—	—
11:15	—	—	—	20.1	5.89	117.6	214	8.14	—	48.98	—
11:20	—	—	—	20.2	5.94	117.7	211	8.15	—	—	—
11:25	—	—	—	20.3	5.94	117.1	212	8.11	—	48.98	—
11:30	—	—	—	20.4	5.98	118.0	216	8.40	—	—	—
11:35	—	—	—	20.5	5.97	117.7	212	9.02	—	48.98	—
11:40	—	—	—	20.5	5.94	118.0	211	8.64	6.3	—	—

Sample Condition Color: colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead 0

Comments: /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-17D
Date: 6/7/05 Sampled By: PP
Sampling Time: 12:55pm Recorded By: PP
Weather: Mostly clear 83° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): Serial #:

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 278 Bottom 298
Sounded Depth (ft bmp): 298 Pump Intake Depth (ft bmp): 288
Depth to Water (ft bmp): 50.60 Purge time Start: 11:55 AM Finish: 12:55pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. ~~(mS/cm)~~ µS/cm	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
11:55	—	—	—	25.4	5.64	102.9	219	7.19	—	—	—
12:00	—	—	—	18.7	5.11	100.4	247	5.96	—	50.60	—
12:05	—	—	—	20.2	5.04	100.1	246	6.34	—	—	—
12:10	—	—	—	20.7	5.04	99.8	248	6.03	—	50.60	—
12:15	—	—	—	20.9	5.03	99.5	250	6.72	—	—	—
12:20	—	—	—	20.9	5.03	99.5	249	6.51	—	50.61	—
12:25	—	—	—	20.9	5.03	99.3	250	6.75	—	—	—
12:30	—	—	—	20.9	5.02	99.4	252	6.71	—	50.60	—
12:35	—	—	—	21.1	5.04	99.1	251	6.84	—	—	—
12:40	—	—	—	21.1	5.00	99.2	252	6.80	—	50.60	—
12:45	—	—	—	21.0	5.06	99.2	251	6.26	—	—	—
12:50	—	—	—	20.9	5.02	99.5	251	6.63	—	50.60	—
12:55	—	—	—	21.2	5.02	99.5	253	6.90	6.1	—	—

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: 34ppm at wellhead; Breathing Zone 0

Comments:

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.0002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-8-05

Site/Well No.: GM-18S | Replicate No.: N/A | Code No.: —

Weather: 80s' | Sampling Time: Begin 2:28pm End 2:33pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	67
Depth to Water (ft bmp)	41.71
Water-Level Elevation (ft)	—
Water Column in Well (ft)	25.29
Casing Diameter/Type	2" (0.16)/steel
Gallons in Well	4.04 ×3
Gallons Pumped/Bailed Prior to Sampling	12
Sample Pump Intake Setting (ft bmp)	Q=1 T=12 1V=4
Purge Time	begin 2:12pm end 2:28pm
Pumping Rate (gpm)	1
Evacuation Method	Rediflow Pump

Field Parameters

Field Parameters	I	1V	2V	3V	4V
Color	Brown	Brown	Colorless		
Odor	slight	None	None	None	Non
Appearance	turbid	turbid	clear	clear	clea
pH (s.u.)	6.14	6.24	6.08	5.90	5.8
Conductivity ~~(mS/cm)~~ (µmhos/cm)	421	178.1	162.5	158.3	157
Turbidity (NTU)	7200	85	30	14	14
Temperature (°C)	18.5	17.9	17.4	17.4	17.4
Dissolved Oxygen (mg/L)	—	—	—	—	—
~~Salinity (%)~~ Time	2:12	2:16	2:20	2:24	2:28

Sampling Method: 3 well volume

Remarks: Hole in hose

PID reading at wellhead 0

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW/PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/8/05

Site/Well No.: GM-18I | Replicate No.: N/A | Code No.: —

Weather: 80s | Sampling Time: Begin ~~11:50~~ PP | End 11:50 AM

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	/
Land Surface Elevation (ft)	/
Sounded Well Depth (ft bmp)	105
Depth to ~~Water~~ packer (ft bmp)	94
Water-Level Elevation (ft)	/
Water Column in Well (ft)	11
Casing Diameter/Type	4" (0.65) / PVC
Gallons in Well	7.15 x 3
Gallons Pumped/Bailed Prior to Sampling	22
Sample Pump Intake Setting (ft bmp)	/
Purge Time	begin 10:25 AM end —
Pumping Rate (gpm)	/
Evacuation Method	Dedicated Bladder/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	Colorless with Black specks	Colorless	Colorless	Colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	5.90	5.68	5.60	5.61
Conductivity ~~(mS/cm)~~ (µmhos/cm)	100.8	103.7	110.1	111.0
Turbidity (NTU)	—	—	—	8.6
Temperature (°C)	18.6	18.6	18.6	18.5
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ 5 gallon container	—	½	½	½

Sampling Method: 3 well volume

Remarks: = five gallon container

94 - 43.11 x .43 + 50 = 80PSI Rounded up

DTW = 43.11

PID reading at wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 0002 Well ID: GM-18D
Date: 6/7/05 Sampled By: PP
Sampling Time: 6:25pm Recorded By: PP
Weather: 80's Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): — Serial #: —

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 290 Bottom 300
Sounded Depth (ft bmp): 300 Pump Intake Depth (ft bmp): 295
Depth to Water (ft bmp): 45.77 Purge time Start: 5:25 pm Finish: 6:25pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm) µS	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
5:25	—	—	—	20.6	5.39	97.1	238	6.32	—	—	—
5:30	—	—	—	19.5	5.29	97.7	239	6.21	—	45.77	—
5:35	—	—	—	19.8	5.09	99.5	242	6.71	—	—	—
5:40	—	—	—	20.3	5.15	101.9	241	6.16	—	45.77	—
5:45	—	—	—	20.4	5.17	102.4	240	6.02	—	—	—
5:50	—	—	—	20.6	5.19	102.8	246	6.61	—	45.77	—
5:55	—	—	—	20.6	5.17	102.9	243	6.50	—	—	—
6:00	—	—	—	20.6	5.18	102.7	244	6.69	—	45.77	—
6:05	—	—	—	20.4	5.20	103.0	244	6.44	—	—	—
6:10	—	—	—	20.4	5.22	102.8	241	6.10	—	45.77	—
6:15	—	—	—	20.4	5.20	103.2	240	6.65	—	—	—
6:20	—	—	—	20.4	5.22	103.0	244	6.23	—	45.77	—
6:25	—	—	—	20.4	5.20	103.1	241	6.37	6.4	—	—

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead 0

Comments: Ash in well (Inside outer casing)

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman Project No. NY001348.0405.00002 Page 1 of 1

Site Location: Bethpage, NY Date: 6-10-05

Site/Well No.: GM-20I Replicate No.: N/A Code No.: —

Weather: overcast 75° Sampling Time: Begin 12:57pm End 1:00pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	105
Depth to ~~Water~~ Packer (ft bmp)	94
Water-Level Elevation (ft)	—
Water Column in Well (ft)	11
Casing Diameter/Type	4" (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	x 3 = 22
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 11:55AM end 12:57pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated Bladder-/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	Colorless	Colorless	Colorless	Colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	11.11	11.05	10.95	10.94
Conductivity ~~(mS/cm)~~ (µmhos/cm)	343	266	241	229
Turbidity (NTU)	—	—	—	—
Temperature (°C)	17.1	15.8	15.2	14.8
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ 5 gallon containers	—	½	½	½

Sampling Method: 3 Well Volume

Remarks: DTW = 35.79 (No turbidity meter)

94 - 35.79 x .43 + 50 = 80 PSI

½ = 5 gallon container Rounded up

PID at wellhead zero

Bolts do not tighten on well cover

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-10-05

Site/Well No.: GM-20D | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 81° | Sampling Time: Begin 2:03 pm | End 2:05 pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	226
Depth to ~~Water~~ packer (ft bmp)	215
Water-Level Elevation (ft)	—
Water Column in Well (ft)	11
Casing Diameter/Type	4" (0.65)
Gallons in Well	7.15 x3
Gallons Pumped/Bailed Prior to Sampling	22
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 1:12 end 2:03 pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated Bladder/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	colorless	colorless	colorless	colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	7.84	5.21	5.11	5.11
Conductivity ~~(mS/cm)~~ (µmhos/cm)	119.3	110.4	106.5	105.7
Turbidity (NTU)	—	—	—	—
Temperature (°C)	15.3	15.2	15.1	15.1
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ 5 gallon container	—	# ½	½ #	# ½

Sampling Method: 3 Well Volume

Remarks: # = 5 gallon container / PID reading at wellhead zero

DTW = 38.42

215 − 38.42 × .43 + 50 = 130 psi (Bolt does not tighten on well cover) rounded up

No turbidity meter

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/6/05

Site/Well No.: GM-21S | Replicate No.: N/A | Code No.: —

Weather: 80's | Sampling Time: Begin 2:19pm | End 2:22pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	67.0
Depth to Water (ft bmp)	36.29
Water-Level Elevation (ft)	—
Water Column in Well (ft)	30.71
Casing Diameter/Type	2" (0.16)/steel
Gallons in Well	4.91
Gallons Pumped/Bailed Prior to Sampling	x3 = 15
Sample Pump Intake Setting (ft bmp)	0=1 T=15 IV=5
Purge Time	begin 2:04 end 2:19pm
Pumping Rate (gpm)	—
Evacuation Method	Rediflow Pump

Field Parameters

Field Parameters	I	IV	2V	3V
Color	Brown	colorless	Color-less	colorless
Odor	None	None	None	None
Appearance	—	clear	clear	None
pH (s.u.)	6.709	6.72	6.43	6.21
Conductivity (~~mS/cm~~)	—	—	—	—
(µmhos/cm)	86.6	92.2	92.8	~~94~~ 933
Turbidity (NTU)	—	—	—	—
Temperature (°C)	17.7	16.9	16.3	16.4
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ Time	2:04	2:09	2:14	2:19

Sampling Method: 3 well volume

Remarks: PID reading at wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-10-05

Site/Well No.: GM-21I | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 79° | Sampling Time: Begin 3:45pm | End 3:48pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	/
Land Surface Elevation (ft)	/
Sounded Well Depth (ft bmp)	140
Depth to ~~Water~~ packer (ft bmp)	129
Water-Level Elevation (ft)	/
Water Column in Well (ft)	11
Casing Diameter/Type	4" (0.65)
Gallons in Well	7.15 x3
Gallons Pumped/Bailed Prior to Sampling	22
Sample Pump Intake Setting (ft bmp)	/
Purge Time	begin 3:00pm end 3:45 pm
Pumping Rate (gpm)	/
Evacuation Method	Dedicated Bladder/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	Colorless	Colorless	Colorless	Colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	10.11	10.27	10.05	9.85
Conductivity ~~(mS/cm)~~ (µmhos/cm)	133.4	134.5	133.3	129.5
Turbidity (NTU)	—	—	—	—
Temperature (°C)	14.3	13.5	13.4	13.6
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ 5 gallon containers	—	● ½	½ ●	● ½

Sampling Method: 3 Well volume

Remarks: DTW = 38.11 (No Turbidity meter)

PID reading at wellhead zero

129 - 38.11 x .43 + 50 = 90 PSI Rounded up

● = 5 gallon container

Bolt on well cover does not tighten

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-21D
Date: 6/6/05 Sampled By: GW/PP
Sampling Time: 1:40pm Recorded By: PP
Weather: 80s Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 278 Bottom 288
Sounded Depth (ft bmp): 288 Pump Intake Depth (ft bmp): 283
Depth to Water (ft bmp): 43.31 Purge time Start: 12:40 Finish: 1:40pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
12:40	—	—	—	18.6	4.66	84.1	215	5.70	—	—	—
12:45	—	—	—	15.5	4.36	83.2	234	5.31	—	43.48	—
12:50	—	—	—	15.3	4.33	81.4	240	5.35	—	—	—
12:55	—	—	—	16.0	4.41	79.3	241	5.23	—	43.48	—
1:00	—	—	—	17.0	4.43	78.7	249	5.12	—	—	—
1:05	—	—	—	17.1	4.46	78.9	248	5.31	—	43.37	—
1:10	—	—	—	17.1	4.48	80.1	253	4.91	—	—	—
1:15	—	—	—	17.2	4.45	80.5	257	5.07	—	43.37	—
1:20	—	—	—	17.1	4.47	81.5	257	5.42	—	—	—
1:25	—	—	—	17.0	4.49	82.1	258	5.50	—	43.37	—
1:30	—	—	—	17.1	4.51	82.5	258	5.03	—	—	—
1:35	—	—	—	17.1	4.52	81.9	261	5.26	—	—	—
1:40	—	—	—	16.9	4.51	81.6	261	4.98	6.4	43.31	—

Sample Condition Color: / Odor: / Appearance: /
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: 0 at wellhead

Comments: /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-33D2
Date: 6/8/05 Sampled By: GW/PP
Sampling Time: 4:50 pm Recorded By: PP
Weather: 80s Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 500 Bottom 520
Sounded Depth (ft bmp): 520 Pump Intake Depth (ft bmp): 510
Depth to Water (ft bmp): 49.89 Purge time Start: 3:50 pm Finish: 4:50 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. ~~(mS/cm)~~ µS/cm	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
3:50	—	450	—	26.2	6.03	74.3	116	6.38	—	—	—
3:55	—	—	—	24.7	7.71	84.8	110	6.47	—	—	—
4:00	—	—	—	23.2	8.64	842	78	5.64	—	50.05	—
4:05	—	—	—	21.3	9.34	106.3	54	5.56	—	—	—
4:10	—	—	—	20.9	9.52	106.7	46	5.58	—	49.89	—
4:15	—	—	—	20.4	9.07	99.5	54	6.13	—	—	—
4:20	—	—	—	20.3	8.55	98.3	62	6.21	—	49.89	—
4:25	—	—	—	19.9	7.00	87.6	101	6.93	—	—	—
4:30	—	—	—	19.9	5.62	88.6	149	7.29	—	49.89	—
4:35	—	—	—	19.7	5.15	87.4	202	7.26	—	—	—
4:40	—	—	—	19.7	5.11	86.4	203	7.23	—	49.89	—
4:45	—	—	—	19.7	5.13	86.0	220	7.24	—	—	—
4:50	—	—	—	19.6	5.15	85.9	222	7.09	8.1	49.88	—

Sample Condition Color: Colorless Odor: None Appearance: Clear
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead 0

Comments: /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-34D
Date: 6/9/05 Sampled By: GW
Sampling Time: 1:45pm Recorded By: PP
Weather: clear 88° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: (Steel) Metal Purge Method: Non-dedicated Bladder Pump / Low Flow
Casing Diameter: 2" Screen Interval (ft bmp): Top 309 Bottom 319
Sounded Depth (ft bmp): 319 Pump Intake Depth (ft bmp): 314
Depth to Water (ft bmp): 15.49 Purge time Start: 12:45pm Finish: 1:45pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. µS (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
12:45	—	—	—	24.1	5.92	117.2	33	3.45	—	—	—
12:50	—	—	—	20.9	6.70	160.9	6	1.64	—	—	—
12:55	—	—	—	20.2	7.07	163.0	2	1.51	—	14.2	—
1:00	—	—	—	26.0	8.79	143.7	-139	1.32	—	—	—
1:05	—	—	—	20.0	8.89	156.6	-95	1.47	—	—	—
1:10	—	—	—	20.0	8.36	168.0	-49	1.59	—	14.64	—
1:15	—	—	—	21.0	7.94	169.3	-29	1.60	—	—	—
1:20	—	—	—	22.7	7.20	170.6	-32	1.69	—	14.64	—
1:25	—	—	—	23.1	6.86	170.5	-34	1.78	—	—	—
1:30	—	—	—	23.3	6.85	168.6	-20	1.67	—	14.64	—
1:35	—	—	—	23.3	6.26	166.5	-5	1.55	—	—	—
1:40	—	—	—	23.2	6.20	165.4	2	1.67	—	15.19	—
1:45	—	—	—	23.0	6.13	164.9	11	1.60	12	—	—

Sample Condition Color: Colorless Odor: None Appearance: Clear
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At Wellhead 0

Comments: /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-34D2
Date: 6/9/05 Sampled By: GW
Sampling Time: 12:30pm Recorded By: RR
Weather: clear, 86° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: (Steel) Metal Purge Method: Non-dedicated Bladder pump / LowFlow
Casing Diameter: 4" Screen Interval (ft bmp): Top 510 Bottom 520
Sounded Depth (ft bmp): 520 Pump Intake Depth (ft bmp): 515
Depth to Water (ft bmp): 18.41 Purge time Start: 11:30 AM Finish: 12:30pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (~~mS/cm~~ µS)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
11:30	—	—	—	19.0	6.19	86.1	192	1.75	—	—	—
11:35	—	—	—	20.7	6.25	83.6	184	1.52	—	18.41	—
11:40	—	—	—	21.1	6.40	81.5	171	1.30	—	—	—
11:45	—	—	—	21.0	6.44	80.9	164	1.19	—	18.41	—
11:50	—	—	—	20.9	6.58	78.7	156	1.15	—	—	—
11:55	—	—	—	21.2	6.71	74.7	135	1.23	—	18.41	—
12:00	—	—	—	21.3	7.74	67.8	103	1.08	—	—	—
12:05	—	—	—	22.0	6.16	90.8	-4	1.91	—	18.48	—
12:10	—	—	—	22.0	6.00	90.6	-22	2.35	—	—	—
12:15	—	—	—	21.7	5.75	89.3	42	3.08	—	18.41	—
12:20	—	—	—	21.7	5.70	88.1	52	3.33	—	—	—
12:25	—	—	—	21.7	5.65	88.3	60	3.41	—	18.41	—
12:30	—	—	—	21.7	5.63	88.3	63	3.55	50	—	—

Sample Condition Color: Black tint Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At wellhead 0

Comments /

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/13/05

Site/Well No.: GM-35D2 | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 87° | Sampling Time: Begin 12:45pm End 12:48pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	530
Depth to ~~Water~~ Packer (ft bmp)	507
Water-Level Elevation (ft)	—
Water Column in Well (ft)	23
Casing Diameter/Type	4" (0.65) / PVC
Gallons in Well	14.95
Gallons Pumped/Bailed Prior to Sampling	x3 45
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 11:26 AM end 12:44 pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated Bladder/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	Colorless	Colorless	Colorless	Colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	5.38	4.64	4.66	4.59
Conductivity ~~(mS/cm)~~ (µmhos/cm)	130.2	127.9	127.0	126.5
Turbidity (NTU)	—	—	—	25
Temperature (°C)	17.3	17.1	17.0	17.1
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ 5 gallon containers	—	# # #	# # #	# # #

Sampling Method: 3 well volume

Remarks: DTW = 41.77

507 − 41.77 x .43 + 50 = 255 psi rounded up

= 5 gallon container

Split sample with Bethpage Water District

PID reading at Wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-39D

Date: 6/3/05 Sampled By: PP / GW

Sampling Time: 4:00pm Recorded By: PP

Weather: 70° Coded Replicate No.: N/A

Instrument Identification

Water Quality Meter(s): — Serial #: —

Purging Information

Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow

Casing Diameter: 4" Screen Interval (ft bmp): Top 262 Bottom 282

Sounded Depth (ft bmp): 282 Pump Intake Depth (ft bmp): 272

Depth to Water (ft bmp): 38.41 Purge time Start: 3:00 pm Finish: 4:00 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (µS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
3:00	—	—	—	18.0	5.13	102.4	236	6.61	—	—	—
3:05	—	—	—	16.5	5.56	99.2	227	6.08	—	38.39	—
3:10	—	—	—	15.9	5.65	98.6	223	6.49	—	—	—
3:15	—	—	—	15.6	5.53	99.3	225	6.57	—	38.41	—
3:20	—	—	—	15.5	5.53	98.9	225	7.00	—	—	—
3:25	—	—	—	15.5	5.54	98.9	226	7.17	—	38.41	—
3:30	—	—	—	15.4	5.55	99.1	226	6.46	—	—	—
3:35	—	—	—	15.4	5.51	99.1	226	6.54	—	38.42	—
3:40	—	—	—	15.4	5.52	99.0	224	6.60	—	—	—
3:45	—	—	—	15.4	5.54	99.0	226	7.19	—	38.41	—
3:50	—	—	—	15.4	5.54	99.5	224	6.68	—	—	—
3:55	—	—	—	15.3	5.55	99.7	226	6.70	—	38.41	—
4:00	—	—	—	15.3	5.55	99.9	226	6.59	5.7	—	—

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading At wellhead 0

Comments —

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-39D2

Date: 6/7/05 Sampled By: PP

Sampling Time: 5:10pm Recorded By: PP

Weather: Partly cloudy 84° Coded Replicate No.: N/A

Instrument Identification

Water Quality Meter(s): ______ Serial #: ______

Purging Information

Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow

Casing Diameter: 4" Screen Interval (ft bmp): Top 410 Bottom 420

Sounded Depth (ft bmp): 420 Pump Intake Depth (ft bmp): 415

Depth to Water (ft bmp): 42.04 Purge time Start: 4:10pm Finish: 5:10pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (~~mS/cm~~ uS)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
4:10	—	—	—	20.3	5.04	105.8	255	7.04	—	—	—
4:15	—	—	—	19.0	5.04	106.9	256	6.88	—	42.04	—
4:20	—	—	—	19.3	4.91	107.0	255	6.55	—	—	—
4:25	—	—	—	19.8	4.89	106.0	253	6.21	—	42.04	—
4:30	—	—	—	19.9	4.94	105.5	252	6.85	—	—	—
4:35	—	—	—	19.5	4.93	105.5	250	6.87	—	42.04	—
4:40	—	—	—	19.1	4.93	105.6	253	7.21	—	—	—
4:45	—	—	—	19.1	5.05	105.4	250	6.79	—	42.04	—
4:50	—	—	—	18.9	5.07	105.7	251	6.60	—	—	—
4:55	—	—	—	18.9	5.07	105.6	253	6.50	—	42.04	—
5:00	—	—	—	18.7	5.05	105.6	250	7.14	—	—	—
5:05	—	—	—	18.7	5.07	105.6	254	6.46	—	42.05	—
5:10	—	—	—	18.6	5.04	105.6	250	7.29	6.1	—	—

Sample Condition Color: Colorless Odor: None Appearance: clear

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead 0

Comments: ______

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-73D

Date: 6-2-05 Sampled By: GW

Sampling Time: 5:30pm Recorded By: GW

Weather: CLEAR 70° Coded Replicate No.: REP-6-2-05 & MS/MSD

Instrument Identification

Water Quality Meter(s): — Serial #: —

Purging Information

Casing Material: PVC Purge Method: Low flow / Dedicated Bladder

Casing Diameter: 4" Screen Interval (ft bmp): Top 401 Bottom 411

Sounded Depth (ft bmp): 411 Pump Intake Depth (ft bmp): 406

Depth to Water (ft bmp): 43.70 Purge time Start: 4:30 pm Finish: 5:30pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
4:30	–	–	–	14.8	4.46	78.2	252	4.78	–	43.70	–
4:35	–	–	–	15.0	4.42	106.4	251	5.66	–	–	–
4:40	–	–	–	14.6	4.46	110.5	256	7.02	–	43.67	–
4:45	–	–	–	14.5	4.48	110.7	254	7.24	–	–	–
4:50	–	–	–	14.5	4.49	110.3	254	7.33	–	–	–
4:55	–	–	–	14.5	4.49	110.7	254	7.40	–	–	–
5:00	–	–	–	14.5	4.49	109.9	256	7.44	–	43.65	–
5:05	–	–	–	14.5	4.48	109.9	258	7.44	–	–	–
5:10	–	–	–	14.3	4.47	110.1	255	7.47	–	–	–
5:15	–	–	–	14.3	4.47	110.1	255	7.46	–	–	–
5:20	–	–	–	14.3	4.46	110.1	256	7.50	–	–	–
5:25	–	–	–	14.3	4.46	110.1	259	7.51	–	–	–
5:30	–	–	–	14.3	4.47	110.0	260	7.49	3.0	43.60	–

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading

Comments —

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-73D2
Date: 6/3/05 Sampled By: PP / GW
Sampling Time: 2:45pm Recorded By: PP
Weather: 70° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): — Serial #: —

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 532 Bottom 552
Sounded Depth (ft bmp): 552 Pump Intake Depth (ft bmp): 542
Depth to Water (ft bmp): 45.10 Purge time Start: 1:45pm Finish: 2:45pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:45	—	—	—	18.9	5.48	183.7	227	6.36	—	—	—
1:50	—	—	—	18.3	5.48	161.9	228	6.69	—	44.36	—
1:55	—	—	—	16.3	5.10	138.0	236	5.60	—	—	—
2:00	—	—	—	16.2	5.10	137.4	235	5.40	—	44.36	—
2:05	—	—	—	16.1	5.09	115.7	240	5.62	—	—	—
2:10	—	—	—	16.1	4.92	110.9	240	6.38	—	44.00	—
2:15	—	—	—	16.1	4.92	109.0	240	6.22	—	—	—
2:20	—	—	—	16.0	4.92	107.9	243	5.93	—	44.25	—
2:25	—	—	—	16.2	4.92	107.4	242	6.29	—	—	—
2:30	—	—	—	16.2	4.94	105.3	244	6.25	—	44.00	—
2:35	—	—	—	16.2	4.89	104.9	245	6.25	—	—	—
2:40	—	—	—	16.1	4.91	104.6	245	6.70	—	44.25	—
2:45	—	—	—	16.1	4.91	104.9	247	6.65	4.4	—	—

Sample Condition Color: Colorless Odor: None Appearance: clear
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: 1.6 ppm at wellhead; Breathing zone 0

Comments: —

GM-14I

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: 4801348.0405 Task: 00002 Well ID: GM-14I
Date: 6-2-05 Sampled By: GW DM
Sampling Time: 1:55pm Recorded By: DM
Weather: CLEAR 70° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: PVC Purge Method: Low flow / Dedicated Bladder
Casing Diameter: 4" Screen Interval (ft bmp): Top 94 Bottom 114
Sounded Depth (ft bmp): 114 Pump Intake Depth (ft bmp): 104
Depth to Water (ft bmp): 39.78 Purge time Start: 12:55 pm Finish: 1:55pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
12:55	—	—	—	14.6	5.16	189.7	158	9.16	—	39.78	—
1:00	1:00	—	—	13.2	5.17	122.0	171	7.35	—	39.91	—
1:05	—	—	—	13.10	4.99	103.6	175	8.14	—	↓	—
1:10	—	—	—	12.8	4.86	~~139~~ 108	181	8.58	—	—	—
1:15	—	—	—	12.8	4.80	101.8	185	8.49	—	39.85	—
1:20	—	—	—	12.8	4.79	100.1	191	8.84	—	—	—
1:25	—	—	—	12.8	4.79	99.2	194	8.89	—	39.82	—
1:30	—	—	—	12.8	4.79	99.0	197	8.87	—	—	—
1:35	—	—	—	12.8	4.79	98.9	199	8.86	—	39.82	—
1:40	—	—	—	12.8	4.78	98.7	202	8.94	—	—	—
1:45	—	—	—	12.7	4.80	98.5	204	8.96	—	39.85	—
1:50	—	—	—	12.8	4.80	98.0	205	8.87	—	—	—
1:55	—	—	—	12.8	4.82	98.1	206	8.88	3.1	39.80	—

Sample Condition Color: — Odor: — Appearance: —
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading

Comments /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY000348.0405 Task: 0000? Well ID: GM-74D
Date: 6-2-05 Sampled By: GW DM
Sampling Time: 3:05pm Recorded By: DM
Weather: CLEAR 70° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): — Serial #: —

Purging Information
Casing Material: PVC Purge Method: Lowflow / Dedicated Bladder
Casing Diameter: 4" Screen Interval (ft bmp): Top 295 Bottom 305
Sounded Depth (ft bmp): 305 Pump Intake Depth (ft bmp): 300
Depth to Water (ft bmp): 45.30 Purge time Start: 2:05pm Finish: 3:05pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (~~mS/cm~~ µS)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
2:05	5	—	—	13.4	4.62	96.6	223	8.96	—	45.30	—
2:10	↓	—	—	13.2	4.20	89.9	238	6.02	—	—	—
2:15		—	—	13.5	4.14	87.5	245	6.03	—	45.28	—
2:20		—	—	13.4	4.12	85.7	246	6.17	—	—	—
2:25		—	—	13.5	4.13	85.0	250	6.14	—	45.30	—
2:30		—	—	13.5	4.13	85.2	251	6.28	—	—	—
2:35		—	—	13.5	4.13	85.2	257	6.30	—	45.28	—
2:40		—	—	13.5	4.15	85.4	283	6.31	—	—	—
2:45		—	—	13.6	4.16	85.1	256	6.32	—	45.28	—
2:50		—	—	13.4	4.16	85.5	255	6.37	—	—	—
2:55		—	—	13.6	4.17	85.3	259	6.35	—	45.29	—
3:00		—	—	13.5	4.17	85.4	257	6.37	—	—	—
3:05	↓	—	—	13.4	4.14	85.6	255	6.45	2.5	45.28	—

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading

Comments —

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

GM-74D2

Project Number: 40013484.0005 Task: 0002 Well ID: GM-74D-2
Date: 6-2-05 Sampled By: GW DW
Sampling Time: 4:15pm Recorded By: DW
Weather: CLEAR 70 Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: PVC Purge Method: Low flow / Dedicated Bladder
Casing Diameter: 4" Screen Interval (ft bmp): Top 542 Bottom 562
Sounded Depth (ft bmp): 562 Pump Intake Depth (ft bmp): 552
Depth to Water (ft bmp): 51.71 Purge time Start: 3:15 pm Finish: 4:15 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. ~~uS/cm~~ mS/cm	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
3:15	—	—	—	13.9	4.22	85.7	257	5.96	—	51.71	—
3:20	—	—	—	13.5	4.42	79.0	250	4.12	—	—	—
3:25	—	—	—	13.5	4.42	76.7	250	2.04	—	51.67	—
3:30	—	—	—	13.6	4.46	76.7	248	2.49	—	—	—
3:35	—	—	—	13.6	4.48	76.3	247	2.81	—	51.65	—
3:40	—	—	—	13.7	4.48	74.0	248	2.93	—	—	—
3:45	—	—	—	13.6	4.48	72.7	250	2.96	—	51.70	—
3:50	—	—	—	13.6	4.47	72.1	249	3.09	—	—	—
3:55	—	—	—	13.7	4.45	72.8	250	3.15	—	51.60	—
4:00	—	—	—	13.8	4.45	73.0	250	3.21	—	—	—
4:05	—	—	—	13.7	4.45	74.4	251	2.95	—	—	—
4:10	—	—	—	13.8	4.45	74.6	251	3.04	—	51.61	—
4:15	—	—	—	13.8	4.45	75.3	252	3.04	<50	—	—

Sample Condition Color: / Odor: — Appearance: —
Sample Collection

Parameter:	Container:	No.	Preservative:
See CoC			

PID Reading

Comments /

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-75D2
Date: 6/9/05 Sampled By: BP
Sampling Time: 3:30pm Recorded By: BP
Weather: 85° Coded Replicate No.: Rep 060905

Instrument Identification
Water Quality Meter(s): Serial #:

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 505 Bottom 525
Sounded Depth (ft bmp): 525 Pump Intake Depth (ft bmp): 515
Depth to Water (ft bmp): 36.60 Purge time Start: 2:30 pm Finish: 3:30 pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. ~~(mS/cm)~~ µS	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
2:30	—	—	—	21.9	5.00	123.6	152	4.32	—	—	—
2:35	—	—	—	22.4	4.87	124.0	156	4.24	—	36.58	—
2:40	—	—	—	22.8	4.84	123.5	160	4.11	—	—	—
2:45	—	—	—	23.0	4.84	122.7	173	4.08	—	36.58	—
2:50	—	—	—	22.9	4.84	121.6	182	4.49	—	—	—
2:55	—	—	—	23.0	4.83	121.6	185	4.46	—	36.58	—
3:00	—	—	—	22.9	4.85	121.9	193	3.98	—	—	—
3:05	—	—	—	22.8	4.87	121.8	195	3.91	—	36.57	—
3:10	—	—	—	22.7	4.85	121.8	202	4.55	—	—	—
3:15	—	—	—	22.7	4.83	121.8	205	4.49	—	36.57	—
3:20	—	—	—	22.5	4.83	121.8	207	4.14	—	—	—
3:25	—	—	—	22.5	4.85	121.8	212	4.07	—	36.56	—
3:30	—	—	—	22.6	4.83	121.7	214	4.48	6.6	—	—

Sample Condition Color: colorless Odor: None Appearance: clear
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead 0

Comments:

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. [illegible] | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-1-05

Site/Well No.: GM-78S | Replicate No.: N/A | Code No.: —

Weather: — | Sampling Time: Begin ~~1323~~ | End ~~1353~~

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	70
Depth to Water (ft bmp)	41.25
Water-Level Elevation (ft)	—
Water Column in Well (ft)	28.25
Casing Diameter/Type	4" (.65)
Gallons in Well	19 x3
Gallons Pumped/Bailed Prior to Sampling	57
Sample Pump Intake Setting (ft bmp)	Q=2 T=28.5 IV=10
Purge Time	begin 1323 end 1353
Pumping Rate (gpm)	2
Evacuation Method	Rediflow Pump

Field Parameters

	I	1	2	3
Color	I	/		
Odor	—	—	—	—
Appearance	—	—	—	—
pH (s.u.)	5.70	5.41	5.44	5.42
Conductivity ~~(mS/cm)~~	924	—	—	—
(µmhos/cm)	170.6	170.9	170.1	167.6
Turbidity (NTU)	22	12	4.9	3.4
Temperature (°C)	18.3	18.3	18.3	18.6
Dissolved Oxygen (mg/L)	—	—	—	—
Salinity (%)	—	—	—	—
Sampling Method	3	Well	Volume	
Remarks Time:	1323	1333	1343	~~1353~~ 1353

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW | DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY 001348-0405
Task: 00007
Well ID: GM-78I
Date: 6-1-05
Sampled By: GW DM
Sampling Time: 1456
Recorded By: DM
Weather: CLEAR 65°
Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): —
Serial #: —

Purging Information
Casing Material: PVC
Purge Method: Low flow / Rediflow Pump
Casing Diameter: 4"
Screen Interval (ft bmp): Top 90 Bottom 110
Sounded Depth (ft bmp): 110
Pump Intake Depth (ft bmp): 100
Depth to Water (ft bmp): —
Purge time Start: 1411 Finish: 1456

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. uS (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1411	0		—	17.6	5.55	128.0	178	56.3	3.5	41.49	—
1416	5	400	—	17.1	5.59	129.0	178	50.1	—	—	—
1421	10	400	—	17.4	5.54	131.5	178	52.3	3.2	41.49	—
1426	15	400	—	18.0	5.58	132.8	181	48.6	—	—	—
1431	20	400	—	18.0	5.61	137.0	181	47.7	2.5	41.49	—
1436	25	400	—	17.8	5.61	140.9	181	45.6	—	—	—
1441	30	400	—	17.9	5.62	141.2	182	45.4	2.5	41.49	—
1446	35	400	—	17.8	5.63	142.4	183	45.6	—	—	—
1451	40	400	—	17.7	5.63	143.0	183	45.2	2.6	41.49	—
1456	45	400	—	17.7	5.64	143.2	184	45.3	2.5	41.49	—

Sample Condition Color: — Odor: — Appearance: —

Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading:

Comments: —

ARCADIS G&M, Inc.

Low-Flow Groundwater Sampling Log

Project Number: NY001348.0405 Task: 00002 Well ID: GM-79D
Date: 6/7/05 Sampled By: BP
Sampling Time: 2:40pm Recorded By: BP
Weather: Partly cloudy 85° Coded Replicate No.: N/A

Instrument Identification
Water Quality Meter(s): / Serial #: /

Purging Information
Casing Material: PVC Purge Method: Dedicated Bladder / Low Flow
Casing Diameter: 4" Screen Interval (ft bmp): Top 280 Bottom 290
Sounded Depth (ft bmp): 290 Pump Intake Depth (ft bmp): 285
Depth to Water (ft bmp): 42.10 Purge time Start: 1:40 pm Finish: 2:40pm

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Rate (mL/min)	Volume Purged	Temp (°C)	pH (SI Units)	Spec. Cond. (~~mS/cm~~ µS)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)	Comments
1:40	—	—	—	17.1	4.85	92.4	260	2.66	—	—	—
1:45	—	—	—	16.7	4.81	91.8	260	3.87	—	42.10	—
1:50	—	—	—	17.2	4.75	91.3	262	4.49	—	—	—
1:55	—	—	—	18.3	4.73	91.1	262	4.07	—	42.10	—
2:00	—	—	—	18.3	4.77	92.0	267	4.04	—	—	—
2:05	—	—	—	18.2	4.78	94.4	266	3.98	—	42.11	—
2:10	—	—	—	18.0	4.71	93.8	268	4.59	—	—	—
2:15	—	—	—	17.9	4.82	93.6	268	4.29	—	42.11	—
2:20	—	—	—	17.8	4.80	93.4	268	4.35	—	—	—
2:25	—	—	—	17.8	4.81	93.4	269	4.10	—	42.12	—
2:30	—	—	—	17.8	4.81	93.7	270	3.91	—	—	—
2:35	—	—	—	17.7	4.81	93.7	267	3.90	—	42.11	—
2:40	—	—	—	17.7	4.83	93.9	271	4.06	6.8	—	—

Sample Condition Color: Colorless Odor: None Appearance: clear
Sample Collection

Parameter:	Container:	No.	Preservative:
See COC			

PID Reading: At wellhead 0
Comments: waist high weeds (vegetation)

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/3/05

Site/Well No.: MW-3R | Replicate No.: N/A | Code No.: —

Weather: 70° | Sampling Time: Begin 1:13pm | End 1:18pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	55
Depth to Water (ft bmp)	34.07
Water-Level Elevation (ft)	—
Water Column in Well (ft)	20.93
Casing Diameter/Type	2" (0.16) PVC
Gallons in Well	3.35
Gallons Pumped/Bailed Prior to Sampling	x 3 = 10.05
Sample Pump Intake Setting (ft bmp)	Q=1 T=10 IV=4
Purge Time	begin 12:57pm end 1:13pm
Pumping Rate (gpm)	—
Evacuation Method	Rediflow Pump

Field Parameters

Field Parameters	I	1V light tan	2V Colorless	3V Colorless	4V Colorless
Color	Orange Brown				
Odor	None	None	None	None	None
Appearance	Turbid	Turbid	cloudy	clear	clear
pH (s.u.)	5.45	5.58	5.64	5.65	5.58
Conductivity (~~mS/cm~~) (µmhos/cm)	97.1	99.5	99.6	99.4	100.2
Turbidity (NTU)	7200	320	65	28	16
Temperature (°C)	14.8	13.2	13.4	13.3	13.1
Dissolved Oxygen (mg/L)	—	—	—	—	—
~~Salinity (‰)~~ Time	12:57	1:01	1:05	1:09	1:13

Sampling Method: 3 well volume

Remarks: PID 0 at wellhead

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW | PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-8-05

Site/Well No.: N-10631 | Replicate No.: N/A | Code No.: —

Weather: 80's | Sampling Time: Begin 3:29pm End 3:34pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	/
Land Surface Elevation (ft)	/
Sounded Well Depth (ft bmp)	67
Depth to Water (ft bmp)	38.52
Water-Level Elevation (ft)	/
Water Column in Well (ft)	28.48
Casing Diameter/Type	2"(0.16)/steel
Gallons in Well	4.56
Gallons Pumped/Bailed Prior to Sampling	x3 14
Sample Pump Intake Setting (ft bmp)	Q=1 T=14 IV=5
Purge Time	begin 3:14pm end 3:29pm
Pumping Rate (gpm)	1
Evacuation Method	Rediflow Pump

Field Parameters

Field Parameters	I	1V	2V	3V
Color	Brown	Colorless	Colorless	colorle
Odor	slight	None	None	None
Appearance	turbid	clear	clear	clear
pH (s.u.)	6.73	6.35	6.09	6.01
Conductivity (mS/cm)	—	—	—	—
(µmhos/cm)	162.8	120.6	118.4	116.4
Turbidity (NTU)	70	17	15	13
Temperature (°C)	17.2	16.2	16.4	16.6
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ Time	3:14	3:19	3:24	3:29

Sampling Method: 3 well volume

Remarks: PID reading at wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW / PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NORTHROP-GRUMMAN Project No. NY001348040S.0002 Page 1 of 1

Site Location: BETHPAGE NY Date: 6-1-05

Site/Well No.: PT1MW-04 Replicate No.: N/A Code No.: —

Weather: — Sampling Time: Begin 12:08pm End —

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	56.15
Depth to Water (ft bmp)	44.12
Water-Level Elevation (ft)	~~+2.03~~
Water Column in Well (ft)	12.03
Casing Diameter/Type	2" (0.16)
Gallons in Well	1.92 x3
Gallons Pumped/Bailed Prior to Sampling	6
Sample Pump Intake Setting (ft bmp)	Q=1 T=6 IV=2
Purge Time	begin 12:02pm end 12:08pm
Pumping Rate (gpm)	1
Evacuation Method	Rediflow Pump

Field Parameters

Field Parameters	I	2J	2J	3J
Color	—	—	—	Colorless
Odor	—	—	—	None
Appearance	—	—	—	Clear
pH (s.u.)	5.42	5.62	5.51	5.69
Conductivity ~~(mS/cm)~~	—	—	—	—
(umhos/cm)	334	305	338	327
Turbidity (NTU)	180	14	4.6	3.6
Temperature (°C)	16.8	17.0	17.8	17.2
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ Time	12:02	12:04	12:06	12:08

Sampling Method: 3 well volume

Remarks: —

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY. | Date: 6/14/05

Site/Well No.: BPOW 1-2 | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 90° | Sampling Time: Begin 5:15 | End 5:19pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	335
Depth to ~~Water~~ packer (ft bmp)	294
Water-Level Elevation (ft)	—
Water Column in Well (ft)	41
Casing Diameter/Type	4" (0.65)
Gallons in Well	26.65
	x3
Gallons Pumped/Bailed Prior to Sampling	80.00
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 4:58 end 5:15pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated Submersible pump/packer

Field Parameters

	I	1V	2V	3V
Color		Colorless		
Odor		NONE		
Appearance	clear	cloudy	clear	clear
pH (s.u.)	4.19	5.22	5.02	5.01
Conductivity ~~(mS/cm)~~ (µmhos/cm)	61.9	52.8	60.0	60.5
Turbidity (NTU)	—	—	—	8.9
Temperature (°C)	15.0	13.5	12.8	13.0
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ DTW	34.54	34.54	34.55	—

Sampling Method: 3 well volume

Remarks: PID reading at wellhead zero

DTW = 33.69

294 − 33.69 x .43 + 50 = 170 PSI

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00001 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/14/05

Site/Well No.: BPOW 1-1 | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 95° | Sampling Time: Begin — End —

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	241
Depth to ~~Water~~ packer (ft bmp)	169
Water-Level Elevation (ft)	—
Water Column in Well (ft)	72
Casing Diameter/Type	4" (0.65)
Gallons in Well	46.8
Gallons Pumped/Bailed Prior to Sampling	x3 = 140
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 11:52 end —
Pumping Rate (gpm)	—
Evacuation Method	Dedicated submersible purge pump

Field Parameters

Field Parameters	I	1V	2V	3V
Color		Colorless		
Odor		NONE		
Appearance		CLEAR		
pH (s.u.)	5.44	4.86	4.73	4.72
Conductivity ~~(mS/cm)~~ (µmhos/cm)	148.5	177.0	219	221
Turbidity (NTU)	—	—	—	6.9
Temperature (°C)	15.7	14.8	14.8	15.2
~~Dissolved~~ Oxygen (mg/L)	—	—	—	—
~~Salinity~~ DTW (%)	30.15	30.15	30.15	29.85

Sampling Method: 3 well Volume

Remarks: PID reading at wellhead zero

DTW = 29.71

169 − 29.71 x .43 + 50 = 120 PSI rounded up

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/15/05

Site/Well No.: BPOW 2-1 | Replicate No.: MS/MSD | Code No.: —

Weather: Overcast 69° | Sampling Time: Begin 12:23pm | End —

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	400
Depth to ~~Water~~ packer (ft bmp)	310
Water-Level Elevation (ft)	—
Water Column in Well (ft)	90
Casing Diameter/Type	4" (0.65)
Gallons in Well	58.5
Gallons Pumped/Bailed Prior to Sampling	x3 175.5
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 11:53 end 12:23pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated submersible pump/packer

Field Parameters

Field Parameters	I	1V	2V	3V
Color	colorless	colorless	colorless	colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	4.35	4.55	4.58	4.60
Conductivity ~~(mS/cm)~~ (µmhos/cm)	106.5	169.9	140.6	121.4
Turbidity (NTU)	—	—	—	3.4
Temperature (°C)	15.1	13.1	13.3	13.0
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ DTW	22.00	21.59	21.08	20.63

Sampling Method: 3 well volume

Remarks: DTW = 22.73

PID reading at wellhead zero

310 − 22.73 x .43 + 50 = 175 psi

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6-15-05

Site/Well No.: BPOW 2-2 | Replicate No.: N/A | Code No.: —

Weather: overcast 70° | Sampling Time: Begin 3:13pm End 3:15pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	/
Land Surface Elevation (ft)	/
Sounded Well Depth (ft bmp)	495
Depth to ~~Water~~ packer (ft bmp)	419
Water-Level Elevation (ft)	/
Water Column in Well (ft)	76
Casing Diameter/Type	4" (0.65)
Gallons in Well	49.40
Gallons Pumped/Bailed Prior to Sampling	x3 148.20
Sample Pump Intake Setting (ft bmp)	/
Purge Time	begin 2:45pm end 3:13pm
Pumping Rate (gpm)	/
Evacuation Method	Dedicated submersible pump/packer

Field Parameters

	I	1V	2V	3V
Color	colorless	Yellow tint	Yellow tint	Colorless
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	4.35	4.49	4.47	4.48
Conductivity ~~(mS/cm)~~ (µmhos/cm)	—	—	—	—
	69.8	69.8	69.7	71.1
Turbidity (NTU)	—	—	—	6.6
Temperature (°C)	14.9	13.1	12.8	13.1
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~ PTW	27.09	27.09	25.31	23.80

Sampling Method: 3 well volume

Remarks: DTW = 24.54

419 − 24.54 × .43 + 50 = 225 PSI

PID reading at wellhead 0

Well casing loose

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/16/05

Site/Well No.: BPOW 3-2 | Replicate No.: Rep061605 | Code No.: —

Weather: Partly cloudy 70° | Sampling Time: Begin 1105pm End 1108pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	647
Depth to ~~Water~~ packer (ft bmp)	503
Water-Level Elevation (ft)	—
Water Column in Well (ft)	144
Casing Diameter/Type	4"(.65)
Gallons in Well	93.6
Gallons Pumped/Bailed Prior to Sampling	x3 280
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin 11:25AM end 1:05pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated Submersible pump/packer

Field Parameters

	I	1V	2V	3V
Color		Colorless		
Odor	Moderate	NONE		None
Appearance	clear	clear		
pH (s.u.)	4.42	4.43	4.60	4.69
Conductivity ~~(mS/cm)~~ (µmhos/cm)	64.8	128.6	82.5	65.7
Turbidity (NTU)	—	—	—	4.1
Temperature (°C)	14.8	13.1	13.3	13.5
Dissolved Oxygen (mg/L)	—	—	—	—
Salinity (%)	—	—	—	—

Sampling Method: 3 well Volume

Remarks: PID reading at wellhead zero
PSI 255 (taken off previous log)
M-Scope probe too thick to measure DT

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/16/05

Site/Well No.: BPOW 3-1 | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 70° | Sampling Time: Begin 3:35 | End 3:38pm

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	516
Depth to ~~Water~~ Packer (ft bmp)	414
Water-Level Elevation (ft)	—
Water Column in Well (ft)	102
Casing Diameter/Type	4" (0.65)
Gallons in Well	66.3
Gallons Pumped/Bailed Prior to Sampling	198.9 (x3)
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin — end 3:35pm
Pumping Rate (gpm)	—
Evacuation Method	Dedicated submersible pump/packer

Field Parameters

	I	1V	2V	3V
Color	Colorless			
Odor	Strong	None	None	None
Appearance	clear	Clear		
pH (s.u.)	4.06	4.03	4.02	4.02
Conductivity ~~(mS/cm)~~ (µmhos/cm)	126.9	131.2	128.3	131.6
Turbidity (NTU)	—	—	—	14
Temperature (°C)	16.2	13.8	14.1	13.3
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity (%)~~	27.86	27.77	27.71	—

Sampling Method: 3 Well Volume

Remarks: PID reading at wellhead zero

DTW = 28.46

414 − 28.46 x.43 + 50 = 220 PSI (Rounded up)

Soil collapse around inside outer well casing.

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NF	Not recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/17/05

Site/Well No.: BPOW 4-1 | Replicate No.: N/A | Code No.: —

Weather: Mostly cloudy 78° | Sampling Time: Begin 2:10pm End 2:13pm

Evacuation Data

	Standpipe	Screen
Measuring Point	TOC	
MP Elevation (ft)	/	
Land Surface Elevation (ft)		
Sounded Well Depth (ft bmp)	652	692
Depth to ~~Water~~ packer (ft bmp)	503	652
Water-Level Elevation (ft)	—	—
Water Column in Well (ft)	149	40
Casing Diameter/Type	4" (0.65)	2" (0.16)
Gallons in Well	96.85 x3 = 290	6.4 x3 = 19.2

Gallons Pumped/Bailed Prior to Sampling: 309 (290+19.2)

Sample Pump Intake Setting (ft bmp): /

Purge Time: begin — end 2:10pm

Pumping Rate (gpm): /

Evacuation Method:

Field Parameters

	I	1V	2V	3V
Color	Colorless	Colorless	Colorless	Colorless
Odor	None	None	None	None
Appearance	clear	cloudy	cloudy	cloudy
pH (s.u.)	5.13	5.85	5.73	5.33
Conductivity ~~(mS/cm)~~ (µmhos/cm)	46.9	104.2	57.0	42.8
Turbidity (NTU)	—	—	—	28
Temperature (°C)	15.3	15.2	13.8	18.0
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity~~ DTW (%)	27.97	27.89	27.78	27.54

Sampling Method: 27.78

Remarks: DTW = 28.96
PSI = 255
PID reading at wellhead zero

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW 1 PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/l	Milligrams per liter	NR	Not recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001348.0405.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/17/05

Site/Well No.: BPOW 4-2 | Replicate No.: N/A | Code No.: —

Weather: Partly cloudy 82° | Sampling Time: Begin 4:51pm | End 4:54

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	764
Depth to ~~Water~~ Packer (ft bmp)	503
Water-Level Elevation (ft)	—
Water Column in Well (ft)	261
Casing Diameter/Type	4" (0.65)
Gallons in Well	169.65 x3
Gallons Pumped/Bailed Prior to Sampling	509
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 2:25 end 4:51pm
Pumping Rate (gpm)	
Evacuation Method	Dedicated ~~Sub~~packer / Bladder

Field Parameters	I	1 V colorless	2 V Yellow tint	3 V colorless
Color	Colorless			
Odor	None	None	None	None
Appearance	clear	clear	clear	clear
pH (s.u.)	4.66	4.39	4.48	4.61
Conductivity ~~(mS/cm)~~ (µmhos/cm)	43.5	137.3	90.0	73.0
Turbidity (NTU)	—	—	—	22
Temperature (°C)	18.1	17.1	15.8	16.1
Dissolved Oxygen (mg/L)	—	—	—	—
~~Salinity~~ PTW (%)	27.22	26.30	26.37	26.3

Sampling Method: 3 well volume

Remarks: PTW = 27.41

PID reading at wellhead zero

503 − 27.41 x .43 + 50 = 255 PSI

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: GW / PP

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not recorded	VOC	Volatile Organic Compounds

ARCADIS

Appendix C

Chain Of Custody Records

ARCADIS

CHAIN OF CUSTODY RECORD Page ___ of ___

Laboratory Task Order No./P.O. No. [illegible]

Project Number/Name: N4001342/0405.00002

Project Location: BETHPAGE NY

Laboratory: SEVERN TRENT SHELTON

Project Manager: CARLO SAN GIOVANNI

Sampler(s)/Affiliation: GW AP

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml Jar VOC	500 ml [illegible]					Remarks	Total
CM 155	L	5.31.05		2	1						
CM 150	↓	↓		2							
CM 150.2	↓	↓		2							
EB 5.31.05	↓	↓		2	1						
TB 5.31.05	↓	↓		[illegible]							

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: [illegible]

Relinquished by: [illegible]	Organization: Arcadis	Date 5/31/[illegible]	Time [illegible]	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks: Report [illegible]

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

AG 05-12/01

ARCADIS

CHAIN-OF-CUSTODY RECORD

Laboratory Task Order No./P.O. No. ______

Page ___ of ___

Project Number/Name NY001348.0405.00002

Project Location BETHPAGE NY

Laboratory SEVERN - TRENT SHELTON

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation G.W. D.M.

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOA VOC 95 [illegible]	500ml plastic Cl only (HNO3)	500ml plastic Cd/Cr (HNO3)				Remarks	Total
PT/MW-04	L	6-1-05			1						1
PT/MW-05	↓				1						1
PT/MW-06	↓				1						1
GM-78S	↓			2		1					3
GM-78I	↓			2		1					3
FB6-1-05	↓			2		1					3
TB6-1-05	↓			2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 14

Relinquished by: [signature]	Organization: ARCADIS	Date 6/1/05	Time 5:00	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks: REPORT TO DAVE STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page ____ of ____

Project Number/Name NY001347.0405.00002

Project Location BETHPAGE NY.

Laboratory SEVERN-TRENT SHELTON

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation G.W. DM.

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VIAL JOC 2000 ASP (UNP)						Remarks	Total
GM-74I	L	6-2-05		2							2
GM-74D	↓	↓		2							2
GM-74D-2				2							2
GM-73D				6*							6*
RP-6-2-05				2							2
TB-6-2-05				2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 16

Relinquished by: [signature]	Organization: ARCADIS	Date 6/2/05	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A	

Special Instructions/Remarks: RUSH

Delivery Method: ☐ In Person ☐ Common Carrier _____ SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. Quarterly

CHAIN-OF-CUSTODY RECORD

Project Number/Name NY001349.0405.00002
Project Location Bethpage, NY
Laboratory Severn Trent Lab - Shelton
Project Manager Dave Stern
Sampler(s)/Affiliation G.W./B.B.

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml Vial VOC PA-200	500 ml plastic Total Cd/Cr (HNO3)	500 ml plastic Dissolved Cd/Cr (HNO3)				Remarks	Total
GM-39D	L	6/3/05		2							
GM-73D2	↓	↓		2							
MW-3R	↓	↓		2	1	1					
GM-17SR	↓	↓		2	1	1					
TB060305	↓	↓		2							
FB 6-3-05	↓	↓		2	1						

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 17

Relinquished by: [signature]	Organization: Arcadis	Date 6/3/05	Time 5:30	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. Grumman Quarterly

CHAIN-OF-CUSTODY RECORD

Project Number/Name NY001349.0405.00002

Project Location Bethpage NY

Laboratory Severn Trent - Shelton

Project Manager Dave Stern

Sampler(s)/Affiliation G.U. P.P.

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml Vial VOC						Remarks	Total
FB060605	L	6/6/05		2							2
TB060605	↓	↓		2							2
GM-21S	↓	↓		2							2
GM-21D	↓	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 8

Relinquished by: [illegible signature]	Organization: Arcadis	Date 6/6/05	Time 5:00 pm	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

AG 05-12/01

[redacted] ARCADIS [redacted] Laboratory Task Order No./P.O. No. [redacted] [redacted] HA[redacted] OF-[redacted] STC[redacted] R[redacted] RD [redacted] age [redacted] of [redacted] [redacted]

Project Number/Name NY00 1345.0405.0002
Project Location Bethpage, NY
Laboratory
Project Manager Dan Stern
Sampler(s)/Affiliation

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE						Remarks	Total
TB060705	L	6/7/05		2							
GM-17 I	↓	↓		2							
GM-17 D				2							
GM-79 D											
GM-79 I											
GM-39 D2				2							
GM-18 D				2							

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers

Relinquished by:	Organization: Arcadis	Date 6/7/05	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks:

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page ____ of ____

Project Number/Name _____

Project Location _____

Laboratory _____

Project Manager _____

Sampler(s)/Affiliation _____

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE							Remarks	Total
TB	L											
GM-131												
GM-135					1	1						
GM-1131					1	1						
GM-3302												
FB					1							

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 17

Relinquished by: _____	Organization: _____	Date ____/____/____	Time _____	Seal Intact?
Received by: _____	Organization: _____	Date ____/____/____	Time _____	Yes No N/A
Relinquished by: _____	Organization: _____	Date ____/____/____	Time _____	Seal Intact?
Received by: _____	Organization: _____	Date ____/____/____	Time _____	Yes No N/A

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☐ Common Carrier _____ (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

ARCADIS [redacted] Laboratory Task Order No./P.O. No. [illegible] [redacted]HA[redacted] OF-[redacted]STC[redacted]Y R[redacted]RD[redacted]age ___ of ___ [redacted]

Project Number/Name NY001948.C405.00002
Project Location Bethpage, NY
Laboratory Severn Trent - Shelton
Project Manager Dave Stern
Sampler(s)/Affiliation G.L. / P.P.

ANALYSIS / METHOD / SIZE

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40 ml vial VOC Aqueous [illegible]						Remarks	Total
TB060905	L	6/9/05		2							2
FB060905	↓	↓		2							2
GM-34D2	↓	↓		2							
GM-34D	↓	↓		2							
GM-75D2	↓	↓		2							
R0060905	↓	↓		2							

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 12

Relinquished by: Cat Gorgonek Organization: Arcadis Date 6/9/05 Time [illegible] Seal Intact? Yes No N/A
Received by: ___ Organization: ___ Date __/__/__ Time ___

Relinquished by: ___ Organization: ___ Date __/__/__ Time ___ Seal Intact? Yes No N/A
Received by: ___ Organization: ___ Date __/__/__ Time ___

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☐ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other ___ (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. _____ CHAIN OF CUSTODY RECORD Page ____ of ____

Project Number/Name NY001749.0405.00002

Project Location Buffalo, NY

Laboratory Severn Trent - Amherst

Project Manager Dave Aten

Sampler(s)/Affiliation RP

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 4 oz Vial Voc - 8260						Remarks	Total
TWOC1605	L	CH.Hr		2							
GM-2C I				2							
GM-10D				2							
GM-21I				2							
GM-15I				6*							

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 14

Relinquished by: Cat Capoah	Organization: Arcadis	Date 6/1/16	Time 10	Seal Intact?	
Received by: _____	Organization: _____	Date __/__/__	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date __/__/__	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date __/__/__	Time _____	Yes	No N/A

Special Instructions/Remarks: Report to Dave Aten.

* Please use MS/MSD sample

Delivery Method: ☐ In Person ☑ Common Carrier Fed Ex ☐ Lab Courier ☐ Other _____

SPECIFY SPECIFY

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. Grumman Quarterly

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001348.0405.00002

Project Location Bethpage, NY

Laboratory Severn Trent - Shelton

Project Manager Dave Stern

Sampler(s)/Affiliation PP

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml vial VOC 2006 ASP (Comp)						Remarks	Total
TB061305	L	6/13/05		2							2
GM-35D2	↓	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 4

Relinquished by: Pat Rafferty	Organization: Arcadis	Date 6/13/05	Time 3:15pm	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes	No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes	No N/A

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. Grumman Outpost

CHAIN-OF-CUSTODY RECORD

Project Number/Name NY001348.0405.00002

Project Location Bethpage NY

Laboratory Severn Trent - Shelton

Project Manager Dave Stern

Sampler(s)/Affiliation PP

ANALYSIS / METHOD / SIZE

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40ml vial VOC 502.2 (unp)						Remarks	Total
TB061405	L	6/14/05		2							2
BPOW 1-1	↓	↓		2							2
BPOW 1-2				2							2
BPOW 1-3				2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 8

Relinquished by: Pat [illegible]	Organization: Arcadis	Date 6/14/05	Time 7:00pm	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

ARCADIS Laboratory Task Order No./P.O. No. Gr[illegible] outpost

CHAIN-OF-CUSTODY RECORD

Page ___ of ___

Project Number/Name NY001119.0405.00002

Project Location Bethpage, NY

Laboratory Severn Trent - Shelton

Project Manager Dave Stern

Sampler(s)/Affiliation PP

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml vial VOC 502.2 comp						Remarks	Total
TB061505	L	6/15/05		2							[illegible]
BP011 2-1	↓	↓		6*							[illegible]
BP011 2-2	↓	↓		2							[illegible]

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 10

Relinquished by: [illegible]	Organization: Arcadis	Date 6/15/05	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks:

Report to Dave Stern

* Please use this sample for a MS/MSD QA/QC sample

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other ___ (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. [redacted] **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name NY001348.0405.00002

Project Location Bethpage, NY

Laboratory Severn Trent - Shelton

Project Manager Dave Stern

Sampler(s)/Affiliation PP

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml vial VOC 502.2 Comp						Remarks	Total
TBAC1605	L	6/16/05		2							2
BPOW 3-1	↓	↓		2							2
BPOW 3-2				2							2
Rep061605				2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 8

Relinquished by: [signature]	Organization: Arcadis	Date 6/16/05	Time 5:45	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex SPECIFY ☐ Lab Courier ☐ Other SPECIFY

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ARCADIS

Laboratory Task Order No./P.O. No. Grumman outpost

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001348.0405.00002

Project Location Bethpage, NY

Laboratory Severn Trent - Shelton

Project Manager Dave Stern

Sampler(s)/Affiliation PF GW

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml VIAL VOC 502.2 (CMP)						Remarks	Total
TB061705	L	6/17/05		2							2
BPGW 4-1	L	1		2							2
BPGW 4-2	L	1		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 6

Relinquished by: [signature]	Organization: Arcadis	Date 6/17/05	Time 6:00pm	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes	No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes	No N/A

Special Instructions/Remarks: Report to Dave Stern

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. ______ **CHAIN-OF-CUSTODY RECORD** Page ____ of ____

Project Number/Name: NY001348.0405.00002
Project Location: BETHPAGE NY
Laboratory: SEVERN-TRENT SHELTON
Project Manager: DAVE STERN
Sampler(s)/Affiliation: G.W. D.M.

ANALYSIS / METHOD / SIZE

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	(2) 40ml VOC 2000 ASP						Remarks	Total
ONCT -1	L	6-15-05		2							2
ONCT 2	↓	↓		2							2
ONCT 3	↓	↓		2							2
GP-1	↓	↓		2							2
GP-3	↓	↓		2							2
TOWER 102 INF	↓	↓		2							2
TOWER 102 EFF	↓	↓		2							2
TOWER 96 INF	↓	↓		2							2
TOWER 96 EFF	↓	↓		2							2
~~TB-6~~ TB	↓	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 20

Relinquished by: [signature]	Organization: ARCADIS	Date 6/15/05	Time 4:30	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	

Special Instructions/Remarks: REPORT TO DAVE STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

AG 05-12/01