ARCADIS GERAGHTY & MILLER

Second Quarter 2000
Groundwater Monitoring Report

Groundwater Interim Remedial Measure
Northrop Grumman Corporation,
Bethpage, New York

P R E P A R E D F O R

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Our Ref.:
NY000008.0210.00004

Date:
13 April 2001

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1. Introduction

This groundwater monitoring report was prepared as part of the operation, maintenance, and monitoring (OM&M) requirements for the groundwater Interim Remedial Measure (IRM) at the Northrop Grumman Corporation (Northrop Grumman) Bethpage, New York facility. Both the hydraulic (groundwater elevation measurements) and groundwater quality monitoring described in this report are currently being conducted by Northrop Grumman on a voluntary basis. The purpose of the monitoring is to evaluate the effectiveness of the groundwater IRM at achieving the remedial goal of preventing the off-site migration of total volatile organic compound (TVOC)-impacted groundwater. Upon execution of a groundwater Record of Decision (ROD) for the Northrop Grumman and Naval Weapons Industrial Reserve Plant (NWIRP) sites, an OM&M plan will be prepared and submitted for New York State Department of Environmental Conservation (NYSDEC) review. Following NYSDEC approval of the plan, the specified groundwater monitoring and reporting will be implemented as a required component of the groundwater remedy.

This report discusses both the short-term changes in groundwater flow and groundwater quality conditions observed during the second quarter of 2000 (i.e., April to June/July 2000) and the longer-term trends (i.e., from the beginning of record through June/July 2000). As in previous groundwater monitoring reports, this report also includes findings, conclusions, and recommendations for modifications to the current groundwater monitoring program. The conclusions and recommendations made in this report will continue to be re-evaluated in future reports as additional hydraulic and groundwater quality data become available and will be incorporated, as appropriate, into the OM&M Plan.

2. Monitoring Program

The second quarter 2000 groundwater monitoring network (hydraulic and groundwater quality) is summarized in Table 1. The Northrop Grumman site, the location of the groundwater IRM, neighboring properties (i.e., the Naval Weapons Industrial Reserve

Plant [NWIRP] and Occidental Chemical Corporation/RUCO Polymer Corporation sites), and monitoring well locations are shown on Figure 1.

The hydrogeologic zones monitored include the shallow zone, the intermediate zone, the deep zone, and the deep2 (D2) zone. These zones were defined and discussed in detail in the groundwater flow modeling report, provided as Appendix B of the Groundwater Feasibility Study (ARCADIS Geraghty & Miller 1999a).

2.1 Hydraulic Monitoring

Hydraulic monitoring for the second quarter 2000 round was delayed from its planned June timeframe until July 2000 due to extended periods of IRM system shutdown in the second quarter (see Section 4 [IRM Operational Monitoring]). Wells planned for monitoring this round included 36 on-site and off-site monitoring wells, and IRM Wells GP-1 ONCT-1, ONCT-2, and ONCT-3, for a total of 40 wells (see Table 1). Water levels were scheduled to be measured in 14 monitoring wells screened in the shallow zone, 7 monitoring wells screened in the intermediate zone, 7 monitoring wells screened in the deep zone, and 12 wells (including the four IRM wells) screened in the D2 zone. Field conditions prevented measuring two of these wells, and two replacement wells were installed at two locations (see Section 2.3 – Modifications to the Field Program).

Water levels were measured in the wells to determine the hydraulic effects, both horizontally and vertically of pumping the IRM wells (see Appendix C for water-level measurement logs). The results of the second quarter 2000 hydraulic monitoring round are described in Section 4 (Groundwater Flow) of this report.

2.2 Groundwater Quality Monitoring

During the second quarter of 2000, the following groundwater quality monitoring was conducted:

- On-site groundwater monitoring for TVOCs to monitor changes and trends in TVOC concentrations from operation of the IRM system.

- Off-site groundwater monitoring for TVOCs to monitor changes and trends in TVOC concentrations from operation of the IRM system and to develop groundwater quality data from outpost wells located downgradient of the Northrop Grumman and NWIRP sites and upgradient of the Bethpage Water District (BWD) Public Supply Wells N-6915 (4-1), N-6916 (4-2), N-8004 (5-1), N-3876 (6-1), and N-8941 (6-2), which are located south of the sites (Figure 1).

- On- and off-site monitoring for Cd/Cr in selected monitoring wells in the southwestern portion of the Northrop Grumman site (south of Plant 2 near the South Recharge Basins), and off-site (southwest of the Northrop Grumman site) to monitor trends in the on/off-site concentrations of Cd/Cr (Figure 1).

Field conditions encountered prevented sampling four wells; one new well was installed and two existing wells were utilized to serve as replacement wells for three of these locations (see Section 2.3 – Modifications to Field Program). Appendix A contains water-level measurement logs, Appendix B contains groundwater sampling methodology, Appendix C contains groundwater sampling logs, Appendix D contains chain-of-custody records, Appendix E contains data validation memoranda, and Appendix F contains water quality letter reports. Section 5 (Groundwater Quality) of this report summarizes the analytical results of groundwater samples collected during the second quarter of 2000.

2.3 Modifications to Field Program

Based on field conditions encountered during the second quarter 2000 groundwater monitoring round, the number of wells monitored were modified as follows:

- A water-level probe access port does not exist at IRM Well GP-1; therefore water-levels cannot currently be measured in this well.

- Water-level measurements and groundwater samples cannot currently be obtained from Monitoring Well N-10624 due to silt in the well screen.

- Due to low groundwater levels, Monitoring Well GM-16S was dry and water levels could not be measured and groundwater samples could not be collected this round. A replacement well, Monitoring Well GM-16SR, was installed in June 2000 and will be used for subsequent rounds.

- Wells HN-28S (sampled this round only) and HN-29S were dry, therefore groundwater samples could not be collected. Monitoring Well FW-01 was identified as an existing replacement well for Well HN-28S. Since water has not been encountered for the past three quarters of monitoring Well HN-29S, Monitoring Wells FW-03 was identified as an existing replacement well and will be used for subsequent rounds.

- Monitoring Well GM-17S was purged and sampled with a disposable bailer due to a low water level.

3. IRM Operational Monitoring

To monitor performance of the groundwater IRM, Northrop Grumman collected water samples for analysis of trichloroethene (TCE) from each IRM extraction well (GP-1, ONCT-1, ONCT-2, and ONCT-3), and from the influent and effluent streams from the two groundwater treatment facilities. Northrop Grumman is conducting this sampling on a voluntary basis for their internal informational use. The water samples were analyzed by Northrop Grumman's internal laboratory and were not subject to USEPA QC criteria; therefore, the resulting data were not validated. This report section provides a qualitative evaluation of the data collected as part of operational monitoring of the IRM through June 2000. Northrop Grumman also maintains logs of the total volume of groundwater pumped from each well on a weekly basis and continually monitors and records the amount of time the IRM wells are operating. These data

were used to determine the percentage of time the IRM wells were operating and the average pumping rates for the IRM wells for their period of operation.

Industrial Supply Well GP-3 was operating continuously during the second quarter of 2000 and although not part of the IRM, Northrop Grumman routinely operates Well GP-3: on demand for industrial supply, to remove VOCs from groundwater, and to provide hydraulic containment backup for IRM Well GP-1. Data collected through the second quarter of 2000 indicate that the VOC concentrations in Well GP-3 are greater than the VOC concentrations in IRM Well GP-1. Northrop Grumman plans to continue to voluntarily operate Well GP-3, as it recognizes the substantial benefit of increasing the rate of VOC mass removal and enhancing the hydraulic containment of the VOC plume in that area of the site.

3.1 IRM Well Operational Data

Northrop Grumman records operational water quality data for the groundwater IRM on a weekly basis. Additionally, ARCADIS Geraghty & Miller has collected hydraulic (pumping depth to water) measurements and instantaneous pumping rates from IRM Wells ONCT-1, ONCT-2, and ONCT-3 during each round of hydraulic measurements (GP-1 cannot currently be measured). Tables 2 and 3 summarize TCE concentrations for the IRM wells and treatment systems, respectively from April to June 2000. Table 4 summarizes the pumpage from the IRM wells and Well GP-3 during this quarter and VOC mass removed from the IRM wells and Well GP-3 during this quarter and cumulatively since IRM startup in September 1998. Table 5 summarizes the performance data collected from the IRM wells. Figure 2 depicts TCE concentrations versus time in IRM Wells GP-1, ONCT-1, and ONCT-2 (along with Industrial Supply Well GP-3), and Figure 3 depicts TCE concentrations versus time in IRM Well ONCT-3, and Industrial Supply Wells GP-10, and GP-11.

3.1.1 Water Quality

As shown on Figure 2, IRM Well ONCT-1 continues to show an overall declining trend (best-fit line) in TCE concentrations since the beginning of record with a noticeable decrease in the rate of the declining trend after November 1998. During the period of record, substantial short-term changes in TCE concentrations occur within IRM Well ONCT-1. IRM Well GP-1 also continues to show an overall declining TCE trend for the period of record with much smaller short-term changes in TCE concentrations than observed in IRM Well ONCT-1. The slope of the best-fit line through the Well GP-1 data is essentially the same as the slope of the best-fit line through the Well ONCT-1 data after November 1998. The TCE concentration trend for Well GP-3 (Figure 2) is increasing for the period of record. During the period of record, short-term changes in TCE concentrations occur in this well that are similar to those observed in Well GP-1. Since October 1999, TCE concentrations in Industrial Supply Well GP-3 are generally greater than the levels detected in IRM Well GP-1 (Figure 2), which is located downgradient of Industrial Supply Well GP-3. The TCE trends (best-fit lines) in Wells GP-1 and GP-3 are essentially identical in slope with Well GP-1 decreasing and Well GP-3 increasing.

As shown on Figure 2, the data for IRM Well ONCT-2 continue to show an increasing trend in TCE concentrations over time, while IRM Well ONCT-3 (Figure 3) exhibits fairly stable and low TCE concentrations for the period of record. The trends in TCE concentrations in Industrial Supply Wells GP-10 and GP-11 (Figure 3) are stable at concentrations generally less than 100 ug/L throughout the period of record.

3.1.2 Pumpage

The total pumpage and average pumping rate for each IRM well during the second quarter were calculated using methods described in previous quarterly reports. The design pumping rates of IRM Wells GP-1, ONCT-1, ONCT-2, and ONCT-3 are 1,075 gallons per minute (gpm), 1,000 gpm, 600 gpm, and 700 gpm, respectively (Geraghty & Miller, Inc. 1996), for a total rate of 3,375 gpm. At 100 percent operation at the

design rates, this would equate to 442 million gallons (MG) pumped for the second quarter.

Based on the available operational data for the second quarter 2000, although the IRM wells were pumping approximately 72 percent of the time, additional pumpage from Industrial Supply Well GP-3 supplemented the total gallons pumped this quarter. While operating, the average pumping rate for each IRM well was as follows: 770 gpm (GP-1); 922 gpm (ONCT-1); 695 gpm (ONCT-2); and 665 gpm (ONCT-3); Well GP-3 pumped continuously at an average rate of 694 gpm (Table 4). Overall, this equates to approximately 365.4 MG pumped this quarter, or approximately 83 percent of the total designed pumpage. Since September 1998, a total of 3.8 billion gallons have been pumped and treated by the IRM wells and Well GP-3.

The majority of the IRM system downtime this quarter was the result of replacing control wiring and logic controls that were damaged from lightning storms. In addition, there were several intermittent, short-term shutdowns of the system resulting from performance of routine O&M activities, and temporary power outages.

Based on instantaneous pumping rates and drawdowns measured on July 21, 2000, the specific capacities for the IRM wells are as follows: ONCT-1 (40.3 gpm/ft); ONCT-2 (33.2 gpm/ft); and ONCT-3 (38.4 gpm/ft) (Table 5). A water level cannot currently be measured in Well GP-1 and therefore, its specific capacity cannot be calculated. For Wells ONCT-1, ONCT-2, and ONCT-3, specific capacities exceed the minimum required for optimum pump performance (Geraghty & Miller, Inc. 1996).

3.2 Treatment Plant Operational Data

Based on the available data for the period April to June 2000 (samples designated by Northrop Grumman as wastewater recovery plant [WWRP]-5E IN; this plant receives water from wells ONCT-1, ONCT-2 and ONCT-3), influent TCE concentrations to the IRM treatment plant ranged from 818 µg/L to 2,496 µg/L (Table 3). Influent TCE concentrations to the IRM Well GP-1 treatment plant for the same time frame

(samples designated as WWRP-5 IN; this plant receives water from IRM Well GP-1 and Industrial Supply Well GP-3), ranged from 525 µg/L to 2,870 µg/L. During the period from April to June 2000, effluent concentrations of TCE from the WWRP-5E and WWRP-5 treatment facilities (samples designated as WWRP-5E OUT and WWRP-5 OUT, respectively) have been less than 2 µg/L; this equates to a VOC removal rate of greater than 99 percent.

In the second quarter of 2000, a total of 271 pounds (lbs) of VOCs were removed from groundwater and treated by the IRM treatment facilities. Since IRM startup in September 1998, a total of 2,943 lbs of VOCs have been removed (Table 4).

3.3 Precipitation

Precipitation data were factored into evaluating the effects of the operation of the groundwater IRM on groundwater flow (See Section 4 – Groundwater Flow) because Northrop Grumman uses the Plant 5 Recharge Basins and South Recharge Basins for the recharge of stormwater runoff. Precipitation data (rainfall and snow, ice sleet, and hail) were reported as equivalent inches of rainfall for the 30-day period prior to the July 21, 2000 round; these data are summarized in Table 6. This section discusses the short-term changes in monthly precipitation observed in the second quarter 2000 in comparison to long-term trends.

To place the precipitation data in perspective, they were compared to the long-term averages (LTA) for monthly precipitation. The LTA data were compiled from 42 complete years of data collected between 1938 and 1995, and are summarized in Table 6. The LTA data for the second quarter months (April, May and June) are as follows: April (3.8 inches); May (3.2 inches); and June (3.1 inches) (NOAA 1996).

Compared to the LTA, April (5.66 inches), May (4.26 inches), and June (4.38 inches), 2000 precipitation totals were greater than the respective LTAs (all were wetter months than average). Monthly precipitation recorded during the second quarter of

2000 on a daily basis is depicted on Figures 4 and 5 (in conjunction with vertical gradient data – for shallow/intermediate well clusters).

4. Groundwater Flow

This report section presents the results of the second quarter 2000 groundwater level measurement round and evaluates the effectiveness of the groundwater IRM at achieving the remedial goal of preventing the off-site migration of TVOC-impacted groundwater. The evaluation of the hydraulic data is performed using methods described in previous quarterly monitoring reports.

The second quarter hydraulic measurement round was conducted while the groundwater IRM was operating; the wells measured and water-level data obtained are summarized in Table 7. Using the data collected, maps showing the water table configuration and directions of groundwater flow (i.e., the shallow zone) and groundwater elevations and flow directions in the D2 zone were prepared. These maps illustrate the effect (i.e., hydraulic containment) of the operation of the groundwater IRM on horizontal groundwater flow patterns. To evaluate the effect of the groundwater IRM on vertical groundwater flow patterns, vertical hydraulic gradients were calculated using water-level data from shallow/intermediate, intermediate/deep, and deep/D2 monitoring well clusters (Table 8). The vertical gradient data totals were graphed versus time along with the model-predicted, steady state vertical gradients (Figures 4 through 8) to illustrate the direction and magnitude of the vertical gradients and trends over time.

4.1 Shallow Zone

The configuration of the water table and directions of groundwater flow in the shallow zone on July 21, 2000 are shown on Figure 9. The following text describes the effects of the groundwater IRM treatment plant discharges and stormwater runoff (as recharge to the South Recharge Basins and the Plant 5 Recharge Basins) on shallow groundwater flow (both horizontal and vertical) during the second quarter 2000 round.

This section also describes vertical groundwater flow measured during the second quarter 2000 and compares this flow to the simulated steady-state vertical gradients predicted by the groundwater flow model (ARCADIS Geraghty & Miller 1999b).

As shown on Figure 9, the configuration of the water-table on July 21, 2000 shows two areas of groundwater mounding situated on the Northrop Grumman site; one mound is centered on the South Recharge Basins and the other is centered on the Plant 5 Recharge Basins.

The maximum elevation of the mounding beneath and around the Plant 5 Basins is greater than 68 ft msl. As a result of the mounding, the horizontal direction of shallow groundwater flow in the vicinity of the Plant 5 Basins is radially to the north, south, west, and east away from the basins. This radial horizontal groundwater flow creates a hydraulic barrier and prevents on-site TVOC-impacted groundwater in this area from migrating off-site in this zone. In addition, observed mounding also increases the vertical hydraulic gradient in the vicinity of the basins, resulting in a downward vertical component of groundwater flow from the shallow zone to the intermediate zone. Using water-level data from the second quarter 2000 round, vertical gradients (Table 8) were calculated for the shallow-intermediate monitoring well pair in the area of the Plant 5 Recharge Basins (GM-16SR/16I). As expected, the vertical gradient in Well Cluster GM-16SR/16I is oriented downward (1.54×10^{-3} ft/ft). Away from the Plant 5 Recharge Basins in the south-central portion of the Northrop Grumman site, the horizontal direction of shallow groundwater flow is to the southeast.

As shown on Figure 9, the maximum elevation of the mound beneath and around the South Recharge Basins is greater than 66 ft msl, and the mound extends across the width of the southern boundary of the site. Similar to that observed at the Plant 5 Basins, the horizontal direction of shallow groundwater flow in the vicinity of the South Recharge Basins is radially to the north, south, west, and east away from the basins, thereby creating an hydraulic barrier and preventing on-site TVOC-impacted groundwater in this area from migrating off-site in the shallow zone. Similar to the

Plant 5 Basins, the mounding around the South Recharge Basins also increases the vertical gradient in the vicinity of the basins, resulting in a downward vertical groundwater flow component from the shallow zone to the intermediate zone. The vertical gradients calculated from the shallow-intermediate monitoring well clusters near the South Recharge Basins (GM-19S/GM-19I north of the basins and GM-21S/GM-21I south of the basins [Table 8 and Figures 4 and 5]) show that the vertical gradients are oriented downward (7.04×10^{-3} ft/ft and 36.1×10^{-3} ft /ft, respectively).

Monitoring well-cluster vertical gradients that are close to groundwater flow model predictions would be a key indicator that the groundwater IRM, through pumpage from the D2 zone and recharge to the shallow zone, has created an effective hydraulic barrier to off-site groundwater flow. As shown on Figures 4 and 5, vertical gradients in the monitoring well clusters located near the basins (GM-16S/GM-16I; GM-19S/GM-19I; and GM-21S/GM-21I) over the period of record, including this quarter, have been consistently oriented downward and are close to or greater than the gradients predicted by the groundwater flow model. These data indicate that the predominant direction of shallow groundwater flow in the vicinity of the basins is vertically downward toward the intermediate zone.

In conclusion, the downward vertical gradients coupled with the radial horizontal flow components near the recharge basins collectively create a hydraulic barrier that prevents on-site TVOC-impacted groundwater from migrating off-site in this zone.

4.2 Intermediate and Deep Zones

As stated in previous reports, since groundwater in the intermediate and deep zones is expected to be flowing in a predominantly vertical (downward) direction in the general vicinity of the groundwater IRM, the analysis of the effectiveness of the groundwater IRM at achieving the remedial goals in these zones is conducted using vertical gradient calculations for intermediate/deep and deep/D2 monitoring well clusters.

Table 8 summarizes the vertical hydraulic gradients calculated from data collected from well clusters in the intermediate/deep zones (i.e., vertical flow through the intermediate zone toward the deep zone) and deep/D2 zones (i.e., vertical flow through the deep zone toward the D2 zone) in the second quarter 2000 and compares them to model-predicted gradients. Figures 6 through 8 show the calculated vertical gradients versus time for the period of record and model-predicted steady-state gradients.

Figure 6 depicts vertical hydraulic gradients in Well Cluster GM-20I/20D. As shown in Table 8 and on Figure 6, the vertical gradient calculated in July 2000 at this cluster is oriented downward (i.e., 15.71×10^{-3}) and is close to the model-predicted value.

Table 8 and Figures 7 and 8 depict vertical gradients in off-site deep/D2 well clusters that are generally located between the Northrop Grumman site boundary and the BWD supply wells. For the deep/D2 zones, vertical gradients calculated in July 2000 for Well Clusters GM-34D/GM-34D2 (11.19×10^{-3} ft/ft); GM-36D/GM-36D2 (9.14×10^{-3} ft/ft); GM-37D/GM-37D2 (8.43×10^{-3} ft/ft), and GM-38D/GM-38D2 (17.59×10^{-3} ft/ft) are oriented downward and are greater than the model-predicted gradients.

In conclusion, vertical hydraulic gradients calculated for July 2000 from intermediate/deep and deep/D2 monitoring well clusters are oriented downward and are greater than or close to steady-state gradients predicted by the groundwater flow model. Furthermore, although few data exist, vertical gradients in well clusters near the Northrop Grumman site boundary indicate that the mounding of the water table coupled with pumping wells in the D2 zone is forcing on-site groundwater downward toward the pumpage in the D2 zone, and continues to prevent groundwater from flowing off-site in the intermediate and deep zones.

4.3 D2 Zone

In the second quarter 2000, water-levels were measured in on- and off-site monitoring wells and IRM Wells ONCT-1, ONCT-2, and ONCT-3 that are screened in the D2

zone. The general directions of groundwater flow were determined by using the triangulation method previously described in prior monitoring reports.

Figure 10 presents the results of the second quarter 2000 hydraulic measurement round. Flow arrows based on triangulation of the water-level elevations in IRM Wells ONCT-1, ONCT-2, and ONCT-3 and Monitoring Wells GM-34D2, GM-35D2, GM-37D2, GM-70D2, and GM-71D2 are generally oriented to the north, indicating that groundwater in this area (i.e., between the IRM extraction wells and the monitoring wells) is influenced by pumpage of the IRM extraction wells. The flow arrow between IRM Well ONCT-1 and Monitoring Well GM-33D2, which is located west of the site, is oriented to the east, indicating that groundwater in this area is influenced by pumpage of the IRM extraction wells. Overall, pumping of the IRM wells has depressed water levels in the D2 zone. As a result of these depressed (lowered) water levels, groundwater moves radially toward the IRM wells. Although there is insufficient data to prove it at this time, it is reasonable to conclude that the cumulative capture zone produced by the pumping of the IRM wells extends upgradient (to the north) and covers a wider area than downgradient (to the south). South of Monitoring Wells GM-35D2, GM-37D2, GM-70D2, and GM-71D2 (Monitoring Well GM-35D2 is approximately 2,000 feet south of the site southern boundary), flow arrows are oriented generally to the south-southeast, indicating that groundwater in this area continues to flow downgradient until it is influenced by the pumping of nearby public supply wells or continues to flow south-southeast in the direction of the regional groundwater flow. These effects have been observed consistently in every round since November 1998.

In conclusion, the available water-level data from the D2 zone indicate that pumpage of the IRM wells (ONCT-1, ONCT-2, ONCT-3, and GP-1) has established an area of capture that controls and contains groundwater on-site and up to approximately 2,000 feet south of the site.

4.4 Summary of Groundwater Flow Conditions

Since the first hydraulic measurement round in November 1998, following IRM system startup in September 1998, groundwater in the shallow zone has consistently flowed in a predominantly southeasterly direction across the NWIRP and Northrop Grumman sites. However, closer to the Plant 5 recharge basins and the South Recharge Basins, groundwater mounding (from stormwater runoff and discharge of treated effluent) beneath and around the basins prevents the off-site movement of groundwater in the shallow zone and forces groundwater vertically downward. Throughout the intermediate and deep zones, groundwater near the IRM wells and basins flows in a predominantly vertical direction into the D2 zone. Within the D2 zone, the pumping of the IRM wells controls groundwater movement and eventually groundwater is captured by the IRM wells before it can move off-site. Treated groundwater from the IRM wells is then discharged to the Plant 5 and South Recharge Basins, where it is reintroduced to the groundwater system. Further off-site, groundwater flows until it is influenced by the pumping of nearby public supply wells or continues to flow southeast in the direction of the regional groundwater flow.

In conclusion, the hydraulic data presented in this report indicate that operation of the groundwater IRM has maintained an effective hydraulic barrier throughout the shallow, intermediate, deep, and D2 zones, which prevents the off-site migration of on-site, contaminated groundwater (i.e., containment of on-site TVOC-impacted groundwater).

5. Groundwater Quality

The second quarter 2000 groundwater sampling round was conducted from June 26 to July 17, 2000. This report section describes the results of the second quarter of 2000 groundwater monitoring round and longer-term trends in groundwater quality observed.

5.1 Total Volatile Organic Compounds

The following subsections describe the distribution of TVOCs in the shallow, intermediate, deep, and D2 zones and compare them to New York State Standards, Criteria, and Guidance Values (SCGs). Each of these subsections concludes with an analysis of TVOC concentration trends observed in selected monitoring wells. The occurrence and distribution of VCM in groundwater is discussed separately in Section 6.2 (Vinyl Chloride Monomer) of this report.

5.1.1 TVOCs in the Shallow and Intermediate Zones

TVOC concentrations detected in shallow and intermediate monitoring wells during the baseline (May 1997), the last two quarters of 1999 and the first two quarters of 2000 groundwater monitoring rounds are provided in Tables 9 and 10, respectively. The groundwater monitoring data in the shallow and intermediate zones are compared to baseline (1997) conditions because sufficient data does not currently exist to evaluate long-term TVOC trends in the shallow/intermediate wells. As new data for wells in these zones are developed, an evaluation of TVOC concentrations over time will be performed if warranted.

In the shallow zone, Wells FW-01 and FW-03, located on the NWIRP site over 4,000 feet north and upgradient of the IRM wells around the South Recharge Basins (see Figure 1), had the highest TVOC concentrations of the shallow wells sampled. Well FW-01 had a TVOC result of 123 µg/L with tetrachloroethene (PCE) (74 µg/L); TCE (25 µg/L), and 1,2-dichloroethene (total) (1,2-DCE) (20 µg/L), all above SCGs of 5 µg/L for these compounds. These wells were not sampled in the baseline round. Well GM-16SR, located in the central portion of the Northrop Grumman site, just north of Plant 2 and approximately 2,500 ft upgradient of the IRM wells around the South Recharge Basins, had a TVOC concentration of 8 µg/L with no exceedences of SCGs. The only VOC detected was acetone, a common laboratory contaminant.

Of the seven remaining shallow wells sampled this round (see Table 8 and Figure 1), three wells had TCE concentrations above SCGs of 5 µg/L, as follows GM-14 (6 µg/L); MW-3R (12 µg/L(l and GM-18S (10 µg/L). The remaining wells had no detections above SCGs. Well GM-14, located on the eastern side of the property, west of Plant 1, was not sampled in the baseline round and shows an apparent slight increase in TVOCs compared to the two previous sampling results for this well. Well MW-3R, located immediately west of the South Recharge Basins, at the southern edge of the site, was not sampled during the baseline round and current TVOC concentrations in this well are very similar to results from the last two sampling rounds for this well. Well GM-18S, located at the western edge of the site, immediately south of Plant 2, has a current TVOC concentration that is essentially the same as during the baseline round. Over the last four sampling rounds, TVOC concentrations in this well have ranged from non-detect to 10 µg/L. Well N-10634, located due south of the site, had no detections above SCGs and even though TVOC detected in this well were 21.5 µg/L, two-thirds of this total was due to a detection of acetone, a common laboratory contaminant.

In the intermediate zone, on the NWIRP site, Wells HN-24I, HN-29I, and HN-28I all located approximately 4,000 ft north (upgradient) of the IRM wells around the South Recharge Basins, had TVOC concentrations of 255 µg/L, 2 µg/L, and 8 µg/L, respectively. SCGs were not exceeded in Well HN-29I, while only the SCG for TCE of 5 µg/L was exceeded in Well HN-29I (7 µg/L). In Well HN-24I, SCGs were exceeded for the following compounds: 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethene (1,2-DCE), 1,1,1-trichoroethane (1,1,1-TCA), TCE, and PCE. The compound with the highest concentration was TCE at 180 µg/L.

Further south on the Northrop Grumman site, the TVOC concentration in Well GM-16I was 24 µg/L with a TCE concentration of 22 µg/L exceeding the SCG of 5 µg/L.

Wells at the southeastern property boundary (GM-15I), southern property boundary (GM-20I and GM-21I), and at the southwestern property boundary (GM-18I), did not have any SCG exceedences. Well GM-15I was the only well with any VOC detections (PCE at 3 µg/L).

The data from the shallow and intermediate wells sampled this quarter confirms the effectiveness of the hydraulic barrier in preventing off-site movement of TVOC-impacted groundwater in the shallow and intermediate zones. Wells with the highest and the most SCG exceedences are located substantial distances north of the South Recharge Basins and lie within the on-site VOC plume. Wells at and near the southern property boundary in the general area of the hydraulic barrier created by the mounding of the water table generally have low TVOC concentrations with most wells having no SCG exceedences.

5.1.2 TVOCs in the Deep Zone

The majority of the deep wells currently monitored have substantial historical groundwater data, which in some cases pre-dates the baseline round. Therefore, in addition to comparing the data to SCGs, the complete history of groundwater TVOC data for select wells is also evaluated.

TVOC concentrations detected in deep monitoring wells during the baseline (May 1997), the last two quarters of 1999 and the first two quarters of 2000 groundwater monitoring rounds are provided in Table 11. Figures 11 through 13 depict TVOC concentrations in selected deep monitoring wells versus time from the beginning of record through the June 2000. In the June round, TCE; 1,1-DCE; 1,1-DCA; 1,2-DCE; 1,1,1-TCA; and PCE were the compounds detected in the deep zone exceeding their respective SCGs of 5 µg/L. TCE was the most frequently detected compound and was detected above the SCG in Well GM-13D (460 µg/L), which is located on the Northrop Grumman site, approximately 2,600 ft north (upgradient) of the IRM wells around the South Recharge Basins (Figure 1). TVOC concentrations in Well GM-13D have increased over the period of record (Figure 11). Other VOCs detected above

SCGs in Well GM-13D include 1,1-DCE (140 µg/L); 1,1-DCA (57 µg/L); cis/trans-1,2-DCE (260 µg/L); PCE (1,100 µg/L); and 1,1,1-TCA (130 µg/L). Well HN-29D, which is approximately 1,300 ft north of Well GM-13D, had a TVOC concentration of 0.9 µg/L (all TCE) this round and has had similar low TVOC levels the previous two sampling rounds.

South of the Northrop Grumman site, TCE concentrations were detected above the SCG in Wells N-10627 (7 µg/L); GM-34D (88 µg/L); GM-36D (24 µg/L), and GM-38D (660 µg/L). There were no other VOCs detected above SCGs in these wells. Well GM-20D had no VOC detections this round, while Well GM-37D had 21 µg/L of TVOCs with 1,1-DCE (9 µg/L) above its SCG of 5 µg/L; TCE was not detected. TVOC concentrations in Well GM-34D historically have ranged between 49 µg/L and 114 µg/L; the TVOC concentration appears to be increasing since early 1999 (Figure 12) however, only six data points are available since early 1999 which is insufficient to establish a trend at this time. TVOC concentrations in Well GM-36D (east of GM-34D) historically have ranged between 24 µg/L (detected this round) and 247 µg/L. The TVOC concentrations in this well have exhibited significant short-term variations and the TVOC concentration trend is sharply downward through the period of record with TVOCs less than 100 µg/L since June 1998 (Figure 12). TVOC concentrations in Well GM-37D (southeast of the sites) historically have ranged between 14 µg/L and 41 µg/L. TVOC concentrations have remained relatively stable at concentrations generally less than 25 µg/L, with the long-term trend essentially flat through the period of record (Figure 12). The area near Well GM-38D (downgradient of GM-36D) historically has been identified as the area exhibiting the highest off-site TVOC concentrations in the deep zone. Historically, TVOC concentrations in Well GM-38D have ranged between 592 µg/L and 1,400 µg/L. From the beginning of record through January 1996, TVOC concentrations exhibited an increasing trend (to a maximum of 1,400 µg/L in January 1996). Groundwater data collected since then has indicated a downward trend in TVOCs, with substantial short-term variations in TVOC concentrations evident throughout the period of record (Figure 13).

Taken collectively, the above-discussed data indicate an overall improving trend for off-site water quality in the deep zone that results in part from the operation of the IRM system, which is preventing the off-site migration of TVOC-impacted groundwater in the deep zone.

5.1.3 TVOCs in the D2 Zone

Similar to the deep zone, current data for the D2 zone was compared to the SCGs while for selected wells, the long-term TVOC trend was also analyzed.

TVOC concentrations in D2 monitoring wells during the baseline (May 1997) the last two quarters of 1999, and the first two quarters of 2000 groundwater monitoring rounds are provided in Table 12. In the June round, TCE; PCE; 1,1-DCE; 1,1-DCA; 1,1,1-TCA; and 1,2-DCE were the compounds detected exceeding their respective SCGs of 5 µg/L. TCE was the most frequently detected compound and the most frequently detected compound exceeding its SCG of 5 µg/L. TCE was detected above the SCG in Wells GM-33D2 (2,400 µg/L), GM-34D2 (75 µg/L), GM-35D2 (91 µg/L), GM-38D2 (790 µg/L and 1,000 µg/L in the replicate), and GM-70D2 (54 µg/L). The other VOC compounds mentioned above were detected sporadically in D2 monitoring wells at concentrations slightly exceeding standards (Table 12).

Figures 11 and 13 through 15 depict TVOC concentrations versus time in select D2 monitoring wells. TVOC concentrations detected in Monitoring Well GM-33D2, which is located south of IRM Well GP-1 and west of IRM Well ONCT-1 have decreased by nearly an order of magnitude from a maximum concentration of 18,010 µg/L in November 1994 to 2,400 µg/L this round. The rate of decrease in TVOC concentrations has accelerated since September 1998 (Figure 11) when the IRM wells became fully operational. In particular, the pumpage of IRM Well ONCT-1 appears to be largely responsible for the accelerated decrease in TVOC concentrations in Well GM-33D2, based on its proximity to Well GM-33D2 and the similar TVOC concentrations currently in both wells.

Off-site, TVOC concentrations in Monitoring Well GM-34D2 (south of Well GM-33D2) historically have ranged between 38 µg/L and 95 µg/L (detected this round) (Figure 15) and while the TVOC trend in this well appears to be upward only six data points have been collected since early 1999, which is insufficient to establish a trend at this time. TVOC concentrations in Monitoring Well GM-35D2 (northeast of Well GM-34D2) historically have ranged between 38 µg/L and 112 µg/L. Prior to March 1998, TVOC concentrations had been increasing while data collected since March 1998 indicates that TVOC concentrations are decreasing from that date to present (Figure 15). TVOC concentrations detected in Monitoring Well GM-70D2 (east of Well GM-35D2) have ranged between 52 and 255 µg/L and have decreased sharply through the period of record (Figure 15). TVOC concentrations detected in Monitoring Well GM-71D2 (east of Well GM-70D2) have ranged between non-detect and 7 µg/L and have remained relatively flat throughout the period of record (Figure 14). TVOC concentrations in Monitoring Well GM-37D2 (east of Well GM-71D2) historically have ranged between 1 µg/L to 29 µg/L (detected this round) and have been increasing through the period of record (Figure 14). TVOC concentrations in Monitoring Well GM-36D2 (further downgradient from the above-discussed wells) historically have ranged between non-detect and 25 µg/L, and the TVOC concentration trend has remained flat throughout the period of record (Figure 14). The area near Monitoring Well GM-38D2 (further downgradient of Well GM-36D2) historically has been identified as the area exhibiting the highest off-site concentrations of TVOCs in the D2 zone. TVOC concentrations in Monitoring Well GM-38D2 historically have ranged between 130 and 1,300 µg/L. Prior to September 1997, TVOC concentrations had been increasing while data collected since September 1997 indicate that TVOC are decreasing with the June 2000 TVOC concentration substantially less than the historically highest value. Throughout the period of record, substantial short-term variations in TVOC concentrations in Monitoring Well GM-38D2 have been evident (Figure 13).

Taken collectively, the above-discussed data indicate an overall improving trend for off-site water quality in the D2 zone that results in part from the operation of the IRM

system, which is preventing the off-site migration of TVOC-impacted groundwater in the D2 zone.

5.2 Vinyl Chloride Monomer

Groundwater monitoring of the VCM subplume emanating from the RUCO Polymer site (near the NWIRP area) is performed on a semi-annual basis (twice yearly); sampling of the VCM subplume-specific monitoring well network was not performed this round. However, in the second quarter 2000, VCM was not detected in any well sampled (i.e., non-VCM subplume-specific wells).

5.3 Tentatively Identified Compounds

For all groundwater samples collected during this round, in addition to the TCL VOCs, the laboratory was requested to perform an analysis and library search to identify and evaluate whether volatile Tentatively Identified Compounds (TICs) exist in the groundwater samples. TICs detected in groundwater samples collected during the June 2000 round are summarized in Table 13. Freon 113 (1,1,2-trichlorotrifluoroethane) was detected in four samples at concentrations ranging from 6 µg/L to 32 µg/L. Based on the occurrence of Freon 113 in groundwater, and its use at the site, this compound will be added to the TCL of VOCs in subsequent rounds. Overall, three TICs were identified at estimated concentrations ranging from 6 µg/L to 32 µg/L. Since the laboratory instruments cannot be calibrated to determine exact TIC concentrations (i.e., they are not included in the TCL VOC list), the concentrations should be used for qualitative purposes only.

5.4 Quality Control Samples - VOCs

Based on the analytical results (Table 14) for the June 2000 round, chloroform and methylene chloride were detected. Based on the results of the data validation, these detections are not considered significant. TCE was detected at 4 µg/L in a single trip

blank; based on the results of the data validation (see Section 5.7 – Data Validation), this concentration is not considered significant.

5.5 Cadmium and Chromium

Groundwater monitoring data in shallow monitoring wells for the last two quarters of 1999 and the first two quarters of 2000 for total cadmium (Cd) and chromium (Cr) are provided in Table 15. The cadmium concentration in Monitoring Well MW-3R (south of Plant 2) (28.9 µg/L) exceeds its SCG of 5 µg/L; concentrations have remained relatively unchanged in this well for the last four sampling rounds. The cadmium concentration in Monitoring Well N-10631 (southwest of Well MW-3R) (1.5 µg/L) is below its SCG; concentrations have also remained relatively unchanged in this well for the last four sampling rounds. The cadmium concentration in Monitoring Well GM-16SR (<0.2 µg/L) is below its SCG; concentrations are similar to the last round. The chromium concentration in Monitoring Well MW-3R (75.8 µg/L) exceeds its SCG of 50 µg/L; concentrations have remained unchanged in this well for the last four sampling rounds. Monitoring Wells GM-16SR and N-10631 have exhibited short-term variations in chromium concentrations, and both were below SCGs in June 2000 (<0.83 µg/L and 27.1 µg/L, respectively).

In conclusion, no significant changes in Cd/Cr concentrations have been observed in June 2000.

5.6 Quality Control Samples - Cd/Cr

Based on the analytical results (Table 15) for an equipment blank samples collected in the June 2000 round, Cd/Cr were not detected at significant concentrations.

5.7 Data Validation

ARCADIS Geraghty & Miller performed validation of the groundwater quality data (including TICs) collected from monitoring wells by following the contract laboratory program national functional guidelines for organic and inorganic data review (USEPA

1994). The quality of the data is considered acceptable with the appropriate qualifications indicated on Tables 9 through 15. Data validation memoranda prepared by ARCADIS Geraghty & Miller are provided in Appendix E.

6. Summary and Conclusions

6.1 IRM System

1. Overall a total of 365.4 MG were pumped and treated this quarter, which is approximately 83 percent of the total design pumpage. The IRM wells were operating approximately 72 percent of the time during the second quarter of 2000; the majority of the downtime was attributed to the need to replace control wiring and logic controls that were damaged from lighting storms. Pumpage of Well GP-3 supplemented the total gallons pumped.

2. Water quality data collected from IRM wells since December 1998 indicate that TCE concentrations have been decreasing in IRM Wells GP-1 and ONCT-1; TCE concentrations in Well ONCT-2 are increasing during the period of record, while TCE concentrations in Well ONCT-3 have fluctuated at low concentrations. Well GP-3, although not technically part of the IRM system, has been pumped to supplement the pumpage. TCE concentrations in Well GP-3 have been increasing for the period of record. In the second quarter of 2000, a total of 271 pounds (lbs) of VOCs were removed from the aquifer and treated by the IRM treatment facilities. Since September 1998, a total of 2,943 lbs of VOCs have been removed from the aquifer.

6.2 Groundwater Flow

3. Water-level data in the shallow zone from June 2000 indicate that operation of the IRM has maintained the groundwater mounding in the Plant 5 Recharge Basins and the South Recharge Basins areas. Overall conditions are consistent with prior rounds of data. Consequently, the hydraulic barrier in the shallow zone has been

maintained and prevents the off-site migration of shallow on-site TVOC-impacted groundwater.

4. Downward vertical hydraulic gradients near the Plant 5 Recharge Basins and South Recharge Basins areas remain close to or greater in magnitude than those predicted by the groundwater flow model and result in downward groundwater movement. This indicates that the mounding of the water table coupled with pumpage from the D2 zone is continuing to force on-site groundwater to move downward toward the pumping IRM wells in the D2 zone, which therefore prevents TVOC-impacted groundwater from flowing off-site in the intermediate and deep zones.

5. Water-level data from the D2 zone generally indicate that the zone of capture, due to pumpage of the IRM Wells ONCT-1, ONCT-2, ONCT-3, and GP-1, continues to control and contain groundwater on-site and up to approximately 2,000 feet south of the site.

6.3 Groundwater Quality

6. As expected, the analytical results from shallow and intermediate monitoring wells in areas within the VOC plume on the Northrop Grumman and NWIRP sites upgradient of the IRM system exhibited the highest concentrations of VOCs in these zones. Off-site, shallow and intermediate monitoring wells exhibited stable or non-detectable concentrations of VOCs. These results confirm the effectiveness of the IRM in preventing the off-site migration of VOC-impacted groundwater in the shallow and intermediate zones.

7. Well GM-13D, located within the on-site VOC plume and upgradient of the IRM system has exhibited an increasing trend in VOC concentrations, while Well HN-29D, located on the NWIRP property, has exhibited trace concentrations of VOCs. These data are consistent with the current understanding of the on-site groundwater plume configuration in the deep zone. Deep wells located

immediately south of the Northrop Grumman site have exhibited low concentrations of VOCs for the past four quarters. Further downgradient of the sites, TVOC concentrations are either stable or have been decreasing for the period of record. The pumpage of the IRM wells are the apparent reason for the overall improvement in groundwater quality and attests to the effectiveness of the IRM in preventing the off-site migration of TVOC-impacted groundwater.

8. Well GM-33D2, located west of IRM Well ONCT-1, has exhibited a decrease trend in VOC concentration; the rate of decrease in VOC concentrations has accelerated since September 1998 when the IRM wells became operational. The Pumpage of IRM Well ONCT-1 appears to be largely responsible for the accelerated decrease in VOC concentration, and on its proximity to Well GM-33D2 and the similar VOC concentrations currently in both wells. Further downgradient, wells have exhibited a downward trend in TVOC concentration, with the exception of Well GM-37D2. TVOC concentrations in Well GM-37D2, however, remain at less then 30 µg/L. Well GM-38D2, which historically exhibited the highest off-site TVOC concentration in the D2 zone, TVOC concentrations have been decreasing since September 1997. Taken collectively, the data indicate an improving trend in TVOC trends in part from operation of the IRM system in precisely the off-site migration of TVOC-impacted groundwater.

9. VCM was not detected in any well sampled this round.

10. Cd/Cr concentrations in the monitoring network near former Plant 2 have not substantially changed based on data collected through June 2000.

7. Recommendations

The draft Groundwater Monitoring Plan that provides for installation of new monitoring wells and expansion of the existing well network has been preliminarily approved by the NYSDEC. The monitoring plan has been appended to the

Groundwater FS for the Northrop Grumman and NWIRP sites. The draft monitoring plan is expected to be finalized after the groundwater ROD is issued. In addition to the items discussed in the draft monitoring plan, ARCADIS Geraghty & Miller recommends the following:

1. Additional analytical parameters, including PCE; 1,1,1-TCA; 1,2-DCE; 1,1-DCA; 1,1 DCE; and VCM should be monitored for at each IRM well, Industrial Well GP-3, and from the IRM system influent and effluent on a calendar-quarterly basis.

2. Freon 113 (1,1,2-trichlorotrifluoroethane), currently monitored as a TIC, should be added to the TCL of VOCs monitored quarterly in the TVOC well network.

8. References

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Table 1. Groundwater Monitoring Network, Second Quarter 2000, Northrop Grumman Corporation, Bethpage, New York.

Well Identification	Aquifer Zone Screened	Well Diameter (inches)	Total Depth (ft bls)	Screened Interval (ft bls)	Planned Monitoring Activity	Status This Round
MW-3R	Shallow	2	55	45 - 55	Water levels, Cd/Cr, TVOC	√
GM-13D	Deep	4	210	200 - 210	Water Levels, TVOC	√
GM-14	Shallow	4	55	15 - 55	TVOC	√
GM-15I	Intermediate	4	105	95 - 105	Water Levels, TVOC	√
GM-16SR	Shallow	4	70	60 - 70	Water Levels, Cd/Cr, TVOC	GM-16S was dry and not sampled; Well GM-16SR was installed and will replace GM-16S.
GM-16I	Intermediate	4	145	135 - 145	Water Levels, TVOC	√
GM-17S	Shallow	4	48	38 - 48	Water Levels, TVOC	√
GM-18S	Shallow	2	67	63 - 67	Water Levels, TVOC	√
GM-18I	Intermediate	4	105	95 - 105	Water Levels, TVOC	√
GM-33D2	Deep2	4	520	500 - 520	Water Levels, TVOC	√
GM-19S	Shallow	4	53	48 - 53	Water Levels	√
GM-19I	Intermediate	4	140	130 - 140	Water Levels	√
GM-20I	Intermediate	4	105	95 - 105	Water Levels, TVOC	√
GM-20D	Deep	4	226	216 - 226	Water Levels, TVOC	√
GM-21S	Shallow	2	67	63 - 67	Water Levels, TVOC	√
GM-21I	Intermediate	4	140	130 - 140	Water Levels, TVOC	√
GM-34D	Deep	2	319	309 - 319	Water Levels, TVOC	√
GM-34D2	Deep2	4	520	500 - 520	Water Levels, TVOC	√
GM-35D2	Deep2	4	530	510 - 530	Water Levels, TVOC	√
GM-36D	Deep	4	214	204 - 214	Water Levels, TVOC	√
GM-36D2	Deep2	4	540	520 - 540	Water Levels, TVOC	√
GM-37D	Deep	4	262	242 - 262	Water Levels, TVOC	√
GM-37D2	Deep2	4	390	370 - 390	Water Levels, TVOC	√
GM-38D	Deep	4	340	320 - 340	Water Levels, TVOC	√
GM-38D2	Deep2	4	495	475 - 495	Water Levels, TVOC	√

See notes on last page

Table 1. Groundwater Monitoring Network, Second Quarter 2000, Northrop Grumman Corporation, Bethpage, New York.

Well Identification	Aquifer Zone Screened	Well Diameter (inches)	Total Depth (ft bls)	Screened Interval (ft bls)	Planned Monitoring Activity	Status This Round
GM-70D2	Deep2	4	330	310 - 330	Water Levels, TVOC	√
GM-71D2	Deep2	4	464	444 - 464	Water Levels, TVOC	√
HN-24I	Intermediate	4	158	148 - 158	TVOC	√
FW-01	Shallow	2	64	49 - 64	TVOC	HN-28S was dry and not sampled; Well FW-01 served as a replacement well.
HN-28I	Intermediate	4	155	131 - 141	TVOC	√
FW-03	Shallow	2	64	49-64	TVOC	HN-29S was dry and not sampled; Well FW-03 serves as a replacement well for subsequent rounds.
HN-29I	Intermediate	4	130	120 - 130	TVOC	√
HN-29D	Deep	4	220	210 - 220	TVOC	√
N-9921	Shallow	2	62	58 - 62	Water Levels	√
N-10597	Shallow	2	67	63 - 67	Water Levels	√
N-10628	Shallow	2	67	63 - 67	Water Levels	√
N-10600	Shallow	2	61	57 - 61	Water Levels	√
N-10624	Intermediate	2	194	190 - 194	Water Levels, TVOC	Silted Well Screen; Not Measured or Sampled
N-10627	Deep	4	295	290 - 295	Water Levels, TVOC	√
N-10631	Shallow	2	67	63 - 67	Water Levels, Cd/Cr, TVOC	√
N-10633	Shallow	2	67	63 - 67	Water Levels	√
N-10634	Shallow	2	67	63 - 67	Water Levels, TVOC	√
N-10821	Shallow	2	67	63 - 67	Water Levels	√
ONCT-1	Deep2	18/12	563	480 - 563	IRM Operational Data	√
ONCT-2	Deep2	18/12	570	466 - 570	IRM Operational Data	√
ONCT-3	Deep2	18/12	617	465 - 617	IRM Operational Data	√
GP-1	Deep2	12	570	519 - 570	IRM Operational Data	No Access Port for Water Levels

See notes on last page

Table 1. Groundwater Monitoring Network, Second Quarter 2000, Northrop Grumman Corporation, Bethpage, New York.

Well Identification	Aquifer Zone Screened	Well Diameter (inches)	Total Depth (ft bls)	Screened Interval (ft bls)	Planned Monitoring Activity	Status This Round
GP-3	Deep2	16	543	483 - 543	Water Quality Data (TCE only)	√
GP-10	Deep2	12	373	312 - 373	Water Quality Data (TCE only)	√
GP-11	Deep2	12	490	429 - 489	Water Quality Data (TCE only)	√

Note: IRM operational data includes recording water quality data (TCE only), total gallons pumped, pumping rates, time online, and specific capacity.

TVOC Total Volatile Organic Compounds

Cd/Cr Cadmium/Chromium

LWD Levittown Water District

BWD Bethpage Water District

NWIRP Naval Weapons Industrial Reserve Plant

√ Well condition was acceptable for all monitoring activity this round.

TCE Trichloroethene

Table 2. Trichloroethene Concentrations in Water Samples Collected from Groundwater IRM Extraction Wells and Industrial Supply Wells GP-3, GP-10, and GP-11, April through June 2000 (Second Quarter), Northrop Grumman Corporation, Bethpage, New York.

	IRM WELLS				INDUSTRIAL WELLS		
Sample Collection Date	GP-1 (ug/L)	ONCT-1 (ug/L)	ONCT-2 (ug/L)	ONCT-3 (ug/L)	GP-3 (ug/L)	GP-10 (ug/L)	GP-11 (ug/L)
4/4/00	548	1,715	101	153	815	84	NS
4/12/00	402	NS	NS	NS	747	81	NS
4/19/00	374	1,360	128	12	864	65	NS
4/25/00	560	NS	NS	NS	896	78	NS
5/2/00	380	NS	NS	NS	718	84	NS
5/10/00	600	NS	NS	NS	960	68	NS
5/17/00	740	1,932	171	16	903	97	NS
5/26/00	690	1,713	240	15	880	61	NS
5/31/00	582	1,840	288	11	935	136	NS
6/7/00	673	1,976	180	15	1,368	123	NS
6/11/00	832	2,164	171	16	1,176	113	NS
6/21/00	739	1,960	169	14	863	111	NS
6/29/00	410	1,245	108	9	848	64	NS
Average Concentration:	579	1,767	173	29	921	90	N/A

Note: Water quality data was collected and analyzed by Northrop Grumman and was not validated.

IRM Interim Remedial Measure
ug/L Micrograms per liter
NS Not sampled; well not operating.

Table 3. Trichloroethene Concentrations in Water Samples Collected from the Groundwater IRM System Influent and Effluent, April through June 2000 (Second Quarter), Northrop Grumman Corporation, Bethpage, New York.

Sample Collection Date	Influent TCE Concentration (ug/L)	Effluent TCE Concentration (ug/L)
IRM System (WWRP-5E)		
4/12/00	1,010	0.6
4/19/00	903	0.8
5/17/00	1,057	0.7
5/26/00	898	0.8
5/31/00	1,136	<0.5
6/7/00	2,496	1.1
6/9/00	844	NA
6/11/00	1,142	0.9
6/21/00	1,086	0.6
6/29/00	818	<0.5
Average Concentration:	1,139	0.6
GP-1 System (WWRP-5)		
4/4/00	630	1.6
4/12/00	676	0.8
4/19/00	594	<0.5
4/25/00	760	0.6
5/2/00	525	1.4
5/10/00	660	<0.5
5/17/00	782	1.3
5/26/00	740	1.7
5/31/00	794	1.5
6/7/00	2,870	NA
6/9/00	976	1.5
6/11/00	856	<0.5
6/21/00	780	1.4
6/29/00	570	<0.5
Average Concentration:	872	0.8

Note: Water quality data was collected and analyzed by Northrop Grumman and was not validated.

IRM Interim Remedial Measure
TCE Trichloroethene
ug/L Micrograms per liter
WWRP Wastewater Recovery Plant
WWRP-5E WWRP 5E system influent and effluent consists of water from IRM Extraction Wells ONCT-1 (Well 17), ONCT-2 (Well 18), and ONCT-3 (Well 19).
WWRP5 WWRP 5 system influent and effluent consists of water from IRM Well GP-1, with intermittent pumpage from Industrial Supply Wells GP-3, GP-10, and GP-11.
NA Not Analyzed

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Table 4. Operational Summary of the Groundwater Interim Remedial Measure and Active Industrial Supply Wells, Second Quarter 2000, Northrop Grumman Corporation, Bethpage, New York.

Well/System Identification	*Second Quarter 2000*				*Project To-Date*	*Second Quarter 2000*			*Project To-Date*
	Average Pumping Rate (gpm)	Total Pumpage (MG)	Design Pumpage (MG)	Percent of Design Pumpage	Cumulative Pumpage (MG) [a]	Average Influent TCE Concentration (ug/L)	Average Effluent TCE Concentration (ug/L)	Total VOC Mass Removed (lbs)	Cumulative VOC Mass Removed [a] (lbs)
IRM Wells									
GP-1	770	83.2	140.9	--	865.3	579	--	53	685
ONCT-1	922	79.7	131.0	--	815.6	1,767	--	120	1,586
ONCT-2	695	57.0	78.6	--	618.2	173	--	8	48
ONCT-3	665	54.6	91.7	--	614.2	29	--	2	13
Industrial Supply Well									
GP-3	694	90.9	--	--	910.0	921	--	88	611
IRM Treatment Systems (includes Well GP-3)									
WWRP-5	--	--	--	--	--	1,189	0.6	141	1,296
WWRP-5E	--	--	--	--	--	872	0.8	130	1,647
TOTALS:	**--**	**365.4**	**442.3**	**83%**	**3,823.3**	**--**	**--**	**271**	**2,943**

Note: Pumpage totals based Northrop Grumman records of operation from April 1 to June 30, 2000.
Days operational this quarter: IRM Well GP-1 (75); IRM Well ONCT-1 (60); IRM Well ONCT-2 (57); IRM Well ONCT-3 (57); Supply Well GP-3 (90).
Pumping rates accurate to +/-15% due to limitations in flow metering.

[a] From IRM startup in Septmber 1998. Total VOC mass estimated from October 2000 data which indicated that TCE concentrations represented a percentage of the total VOC concentration, as follows: GP-1 (87 percent); ONCT-1 (99 percent); ONCT-2 (87 percent); ONCT-3 (48 percent); and GP-3 (91 percent). The full list of VOCs will be monitored quarterly in subsequent rounds.

IRM Interim Remedial Measure
gpm gallons per minute
MG Million Gallons
ug/L micrograms per liter
lbs pounds
-- Not Available or Not Applicable

Table 5. Groundwater IRM Extraction Well Performance Data from October 1999 through July 2000, Northrop Grumman Corporation, Bethpage, New York.

IRM Well Identification	Baseline Round Static Depth to Water 5/9/97 (ft bmp)	Last Four Water-Level Measurement Dates	Pumping Depth to Water (ft bmp)	Pumping Rate (gpm)	Drawdown (ft)	Specific Capacity (gpm/ft)
ONCT-1	44.12	October 18,1999	76.63	965	32.51	29.7
		January 5, 2000	68.91	1004	24.79	40.5
		March 9, 2000	68.00	885	23.88	37.1
		July 21, 2000	68.44	980	24.32	40.3
ONCT-2	50.15	October 18,1999	69.49	660	19.34	34.1
		January 5, 2000	69.05	605	18.90	32.0
		March 9, 2000	68.62	615	18.47	33.3
		July 21, 2000	67.82	586	17.67	33.2
ONCT-3	49.13	October 18,1999	69.68	774	20.55	37.7
		January 5, 2000	68.28	721	19.15	37.7
		March 9, 2000	67.52	650	18.39	35.3
		July 21, 2000	66.53	668	17.40	38.4
GP-1	--	October 18,1999	--	--	--	--
		January 5, 2000	--	--	--	--
		March 9, 2000	--	800*	--	--
		July 21, 2000	--	800*	--	--

Note: Specific capacity is calculated by dividing the pumping rate (Q) by the drawdown (s).

IRM	Interim Remedial Measure
gpm	gallons per minute
ft bmp	feet below measuring point
--	Data could not be collected
*	Data collected by Northrop Grumman personnel
ft	feet
gpm/ft	gallons per minute per foot of drawdown

Table 6. Precipitation Data for the Second Quarter 2000 and Long-Term Averages, Northrop Grumman Corporation, Bethpage, New York.

Date Precipitation Recorded	Rainfall [a] (inches)	Snowfall [a,c] (inches)	Total Precipitation (inches)	Long-Term Average Monthly Precipitation [b,d] (inches)
April 2000				
April 4, 2000	0.21	0.00	---	---
April 8, 2000	0.09	0.00	---	---
April 9, 2000	0.49	0.00	---	---
April 11, 2000	0.05	0.00	---	---
April 12, 2000	0.03	0.00	---	---
April 15, 2000	0.38	0.00	---	---
April 16, 2000	0.44	0.00	---	---
April 17, 2000	0.27	0.00	---	---
April 18, 2000	0.19	0.00	---	---
April 21, 2000	3.21	0.00	---	---
April 22, 2000	0.28	0.00	---	---
April 26, 2000	0.02	0.00	5.66	3.80
May 2000				
May 1, 2000	0.02	0.00	---	---
May 2, 2000	0.12	0.00	---	---
May 7, 2000	0.10	0.00	---	---
May 10, 2000	0.23	0.00	---	---
May 12, 2000	0.08	0.00	---	---
May 13, 2000	0.45	0.00	---	---
May 14, 2000	0.06	0.00	---	---
May 18, 2000	1.15	0.00	---	---
May 19, 2000	0.60	0.00	---	---
May 20, 2000	0.31	0.00	---	---
May 21, 2000	0.04	0.00	---	---
May 22, 2000	0.17	0.00	---	---
May 23, 2000	0.04	0.00	---	---
May 24, 2000	0.73	0.00	---	---
May 25, 2000	0.16	0.00	4.26	3.20
June 2000				
June 2, 2000	0.08	0.00	---	---
June 6, 2000	2.31	0.00	---	---
June 7, 2000	0.44	0.00	---	---
June 11, 2000	0.58	0.00	---	---
June 12, 2000	0.45	0.00	---	---
June 13, 2000	0.02	0.00	---	---
June 15, 2000	0.02	0.00	---	---
June 18, 2000	0.09	0.00	---	---
June 20, 2000	0.03	0.00	---	---
June 21, 2000	0.01	0.00	---	---

See notes on last page

Table 6. Precipitation Data for the Second Quarter 2000 and Long-Term Averages, Northrop Grumman Corporation, Bethpage, New York.

Date Precipitation Recorded	Rainfall [a] (inches)	Snowfall [a,c] (inches)	Total Precipitation (inches)	Long-Term Average Monthly Precipitation [b,d] (inches)
June 2000, continued				
June 22, 2000	0.03	0.00	---	---
June 26, 2000	0.14	0.00	---	---
June 27, 2000	0.08	0.00	---	---
June 28, 2000	0.10	0.00	4.38	3.10
Precipitation Totals for 30-Day Period Preceding Hydraulic Measurement Round				
July 21, 2000	---	---	4.10	---

a) From National Oceanic and Atmospheric Administration (NOAA), 2000 Mineola, New York Cooperative Station.

b) From National Oceanic and Atmospheric Administration (NOAA),1996 Mineola, New York Cooperative Station.

c) Snowfall (includes snow, ice, sleet, and hail) in inches is converted to equivalent inches of water and then added to rainfall amount to determine total monthly precipitation.

d) Long-term monthly averages compiled from 42 complete years of precipitation data collected between 1938 and 1995 at the Mineola, New York Cooperation Station.

--- Not Applicable

Table 7. Water-Level Measurement Data, Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

Well Designation	Measuring Point Elevation (ft msl)	Depth to Water July 21, 2000 (ft bmp)	Water-Level Elevation July 21, 2000 (ft msl)
Shallow Wells			
N-9921	94.23	34.65	59.58
N-10597	109.85	44.54	65.31
N-10600	102.41	41.71	60.70
N-10628	100.88	NM	NM
N-10631	103.47	41.53	61.94
N-10633	103.80	41.89	61.91
N-10634	101.20	42.98	58.22
N-10821	91.58	37.41	54.17
GM-16SR	115.77	50.35	65.42
GM-17S	115.66	46.56	69.10
GM-18S	107.60	43.35	64.25
GM-19S	109.86	46.86	63.63
GM-21S	105.81	38.63	67.18
Intermediate Wells			
N-10624*	93.61	--	--
GM-15I	109.29	47.51	61.78
GM-16I	115.81	50.50	65.31
GM-18I	109.03	45.00	64.03
GM-19I	109.86	46.23	63.00
GM-20I	103.88	39.69	64.19
GM-21I	105.72	41.07	64.65
Deep Wells			
N-10627	93.70	35.36	58.34
GM-13D	113.97	49.39	64.58
GM-20D	103.92	41.63	62.29
GM-34D	71.19	17.61	53.58

Table 7. Water-Level Measurement Data, Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

Well Designation	Measuring Point Elevation (ft msl)	Depth to Water July 21, 2000 (ft bmp)	Water-Level Elevation July 21, 2000 (ft msl)
Deep Wells, continued			
GM-36D	91.63	38.25	53.38
GM-37D	97.26	42.08	55.18
GM-38D	91.75	41.48	50.27
Deep2 Wells			
GM-33D2	106.85	52.19	54.66
GM-34D2	71.19	19.86	51.33
GM-35D2	96.28	43.22	53.06
GM-36D2	91.60	41.20	50.40
GM-37D2	97.17	43.07	54.10
GM-38D2	91.56	44.02	47.54
GM-70D2	99.58	44.32	55.26
GM-71D2	98.45	45.04	53.41
IRM Extraction Wells			
GP-1 **	--	--	--
ONCT-1	104.10	68.44	35.66
ONCT-2	110.00	67.82	42.18
ONCT-3	108.70	66.53	42.17

* Water-level measurements collected from Monitoring Well N-10624 are considered anomalous due to silt in the well screen.
** Water-levels could not be measured in Well GP-1.
ft msl feet relative to mean sea level
ft bmp below measuring point
-- Not measured.

Table 8. Comparison of Vertical Hydraulic Gradients from the Second Quarter 2000 Groundwater Monitoring Rounds to Model-Predicted Gradients, Northrop Grumman Corporation, Bethpage, New York.

Well Pairing ID	Measuring Point Elevation (ft msl)	Well Screen Midpoint Elevation (ft msl)	21-Jul-00 Water-Level Elevation (ft msl)	21-Jul-00 Vertical Gradient (ft/ft) * 10^{-3}	Model-Predicted, IRM Steady-State Vertical Gradient (ft/ft) * 10^{-3}	Increase Compared to Model-Predicted, Steady-State Vertical Gradient
Shallow-Intermediate Wells						
GM-16SR	115.77	66.77	65.45			
GM-16I	115.81	-24.19	65.31	1.54	1.11	0.43
GM-18S	107.60	42.60	64.25			
GM-18I	109.03	9.03	64.03	6.55	1.78	4.77
GM-19S	109.86	64.36	63.63			
GM-19I	109.86	-25.14	63.00	7.04	2.44	4.59
GM-21S	105.81	40.81	67.18			
GM-21I	105.72	-29.28	64.65	36.10	18.44	17.65
Intermediate-Deep Wells						
GM-20I	103.88	3.88	64.19			
GM-20D	103.92	-117.08	62.29	15.71	18.22	-2.51
Deep-Deep 2 Wells						
GM-34D	71.19	-242.81	53.58			
GM-34D2	71.19	-443.81	51.33	11.19	2.33	8.86
GM-36D	91.63	-117.37	53.38			
GM-36D2	91.60	-443.40	50.40	9.14	2.75	6.39
GM-37D	97.26	-154.74	55.18			
GM-37D2	97.17	-282.83	54.10	8.43	3.88	4.56
GM-38D	91.75	-238.25	50.27			
GM-38D2	91.56	-393.44	47.54	17.59	6.08	11.51

Vertical hydraulic gradients are calculated as follows:

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

A positive "+" gradient value indicates a downward hydraulic gradient.
A negative "-" gradient value indicates an upward hydraulic gradient.

ft msl feet relative to mean sea level
ft feet

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	10631 MW-10631 12/1/99	10631 N-10631 3/13/00	10631 N-10631 6/27/00	10634 10634 9/13/99
Chloromethane	5		< 5	< 10	< 10	< 5 J
Bromomethane	5		< 5	< 10	< 10	< 5
Vinyl chloride	2		< 2	< 1	< 0.3	< 2
Chloroethane	5		< 5	< 10	< 10 J	< 5
Methylene chloride	5		< 5	< 10	< 10	< 5
Acetone	50		< 10	< 10 J	< 10 J	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 5	< 10	< 10	< 5
1,1-Dichloroethane	5		< 5	< 10	< 10	< 5
1,2-Dichloroethene (total)	5		< 5	< 10	< 10	< 5
Chloroform	7		< 7	< 10	< 10	< 7
1,2-Dichloroethane	5		< 5	< 10	< 10	< 5
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 5	< 10	< 10	< 5
Carbon tetrachloride	5		< 5	< 10	< 10	< 5
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 5	< 10	< 10	< 5
cis-1,3-Dichloropropene	5		< 5	< 10 J	R	< 5
Trichloroethene	5		**0.5 J**	< 10	< 10	< 5
Dibromochloromethane	5		< 5	< 10	< 10	< 5
1,1,2-Trichloroethane	5		< 5	< 10	< 10	< 5
Benzene	0.7		< 0.7	< 10	< 10	< 0.7
trans-1,3-Dichloropropene	5		< 5	< 10 J	< 10	< 5
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 5	< 10	< 10	< 5
1,1,2,2-Tetrachloroethane	5		< 5	< 10	< 10	< 5
Toluene	5		< 5	< 10	< 10	< 5
Chlorobenzene	5		< 5	< 10	< 10	< 5
Ethylbenzene	5		< 5	< 10	< 10	< 5
Styrene	5		< 5	< 10	< 10	< 5
Xylene (total)	5		< 5	< 10	< 10	1 J
Total VOCs			**0.5**	0	**0**	1

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	10634 N-10634 11/10/99	10634 N-10634 3/15/00	10634 N-10634 6/26/00	GM-14 GM-14 11/10/99
Chloromethane	5		< 5	< 10	< 10	< 0.4
Bromomethane	5		< 5	< 10	< 10	< 0.1 J
Vinyl chloride	2		< 2	< 1	< 0.3	< 0.6
Chloroethane	5		< 5 J	< 10	< 10	< 0.8
Methylene chloride	5		< 5	< 10	< 10	< 0.1
Acetone	50		< 10 J	< 10 J	**14 J**	< 0.8
Carbon disulfide	50		< 10	< 10	< 10 J	< 0.2
1,1-Dichloroethene	5		< 5	< 10	< 10	< 0.4
1,1-Dichloroethane	5		< 5	< 10	< 10	< 0.1
1,2-Dichloroethene (total)	5		< 5	< 10	< 10	< 0.8
Chloroform	7		< 7	< 10	< 10	< 0.5
1,2-Dichloroethane	5		< 5	< 10	< 10	< 0.2
2-Butanone	50		< 10	< 10 J	**4 J**	< 0.6
1,1,1-Trichloroethane	5		< 5	< 10	< 10	< 0.8
Carbon tetrachloride	5		< 5	< 10	< 10	< 0.4
Bromodichloromethane	50		< 10	< 10	< 10	< 0.2
1,2-Dichloropropane	5		< 5	< 10	< 10	< 0.2
cis-1,3-Dichloropropene	5		< 5	< 10	R	< 0.2
Trichloroethene	5		< 5	< 10	**2 J**	< 0.2
Dibromochloromethane	5		< 5	< 10	< 10	< 0.1
1,1,2-Trichloroethane	5		< 5	< 10	< 10	< 0.8
Benzene	0.7		< 0.7	< 10	< 10	< 0.3
trans-1,3-Dichloropropene	5		< 5	< 10	< 10	< 0.3
Bromoform	50		< 10	< 10 J	< 10	< 0.1
4-Methyl-2-pentanone	50		< 10 J	< 10	< 10	< 0.4
2-Hexanone	50		< 10 J	< 10	< 10	< 0.6
Tetrachloroethene	5		< 5	< 10	**1 J**	< 0.4
1,1,2,2-Tetrachloroethane	5		< 5	< 10	< 10	< 0.2
Toluene	5		< 5	< 10	**0.5 J**	< 0.3
Chlorobenzene	5		< 5	< 10	< 10	< 0.2
Ethylbenzene	5		< 5	< 10	< 10	< 0.2
Styrene	5		< 5	< 10	< 10	< 0.2
Xylene (total)	5		< 5	< 10	< 10	< 0.6
Total VOCs			0	0	**21.5**	0

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-14 GM-14 3/13/00	GM-14 GM-14 6/26/00	GM-16S* GM-16S 10/29/91	GM-16S* GM-16S 8/26/93
Chloromethane	5		< 10	< 10	< 10	< 10
Bromomethane	5		< 10	< 10	< 10	< 10
Vinyl chloride	2		< 1	< 0.3	< 10	< 10
Chloroethane	5		< 10	< 10	< 10	< 10
Methylene chloride	5		< 10	< 10	< 5	< 10
Acetone	50		< 10 J	**8 J**	< 10	< 10
Carbon disulfide	50		< 10	< 10 J	< 5	< 10
1,1-Dichloroethene	5		< 10	< 10	< 5	< 10
1,1-Dichloroethane	5		< 10	< 10	< 5	< 10
1,2-Dichloroethene (total)	5		< 10	< 10	< 5	< 10
Chloroform	7		< 10	< 10	< 5	< 10
1,2-Dichloroethane	5		< 10	< 10	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 10	< 5	< 10
Carbon tetrachloride	5		< 10	< 10	< 5	< 10
Bromodichloromethane	50		< 10	< 10	< 5	< 10
1,2-Dichloropropane	5		< 10	< 10	< 5	< 10
cis-1,3-Dichloropropene	5		< 10 J	R	< 5	< 10
Trichloroethene	5		< 10	**6 J**	< 5	< 10
Dibromochloromethane	5		< 10	< 10	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 5	< 10
Benzene	0.7		< 10	< 10	< 5	< 10
trans-1,3-Dichloropropene	5		< 10 J	< 10	< 5	< 10
Bromoform	50		< 10	< 10	< 5	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 10	**4 J**	< 5	< 10
1,1,2,2-Tetrachloroethane	5		< 10	< 10	< 5	< 10
Toluene	5		< 10	**2 J**	< 5	< 10
Chlorobenzene	5		< 10	< 10	< 5	< 10
Ethylbenzene	5		< 10	< 10	< 5	< 10
Styrene	5		< 10	< 10	< 5	< 10
Xylene (total)	5		< 10	< 10	< 5	< 10
Total VOCs			0	**20**	0	0

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-16S GM-16S 3/13/00	GM-16SR MW-16SR 6/27/00	GM-17S GM-17S 7/6/00	GM-18S GM-18S 5/13/97
Chloromethane	5		< 10	< 10	< 10	< 10
Bromomethane	5		< 10	< 10	< 10	< 10
Vinyl chloride	2		< 1	< 0.3	< 0.3	< 10
Chloroethane	5		< 10	< 10	< 10	< 10
Methylene chloride	5		< 10	< 10	< 10	< 10
Acetone	50		< 10 J	**8 J**	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 10	< 10	**1 J**
1,1-Dichloroethane	5		< 10	< 10	< 10	< 10
1,2-Dichloroethene (total)	5		< 10	< 10	< 10	< 10
Chloroform	7		< 10	< 10	< 10	< 10
1,2-Dichloroethane	5		< 10	< 10	< 10	< 10 J
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 10	< 10	< 10
Carbon tetrachloride	5		< 10	< 10	< 10	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene	5		< 10 J	R	< 10	< 10
Trichloroethene	5		< 10	< 10	< 10	**1 J**
Dibromochloromethane	5		< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 10	< 10
Benzene	0.7		< 10	< 10	< 10	**0.7 J**
trans-1,3-Dichloropropene	5		< 10 J	< 10	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10 J
2-Hexanone	50		< 10	< 10	< 10	< 10 J
Tetrachloroethene	5		< 10	< 10	< 10	**0.8 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 10	< 10	< 10 J
Toluene	5		< 10	< 10	< 10	**3 J**
Chlorobenzene	5		< 10	< 10	< 10	< 10
Ethylbenzene	5		< 10	< 10	< 10	**0.5 J**
Styrene	5		< 10	< 10	< 10	**0.2 J**
Xylene (total)	5		< 10	< 10	< 10	**1 J**
Total VOCs			0	**8**	**0**	**8.2**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-18S GM-18S 9/8/99	GM-18S GM-18S 11/10/99	GM-18S GM-18S 3/15/00	GM-18S GM-18S 6/27/00
Chloromethane	5		< 5	< 10	< 10	< 10
Bromomethane	5		< 5	< 10	< 10	< 10
Vinyl chloride	2		< 2	< 0.3	< 1 J	< 0.3
Chloroethane	5		< 5	< 10 J	< 10	< 10 J
Methylene chloride	5		< 5	< 10	< 10	< 10
Acetone	50		< 10	< 10 J	< 10	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10 J
1,1-Dichloroethene	5		< 5	< 10	< 10	< 10
1,1-Dichloroethane	5		< 5	< 10	< 10	< 10
1,2-Dichloroethene (total)	5		< 5	< 10	< 10	< 10
Chloroform	7		< 7	< 10	< 10	< 10
1,2-Dichloroethane	5		< 5	< 10	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 5	< 10	< 10	< 10
Carbon tetrachloride	5		< 5	< 10	< 10	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 5	< 10	< 10	< 10
cis-1,3-Dichloropropene	5		< 5	< 10	< 10	R
Trichloroethene	5		< 5	< 10	7 J	10
Dibromochloromethane	5		< 5	< 10	< 10	< 10
1,1,2-Trichloroethane	5		< 5	< 10	< 10	< 10
Benzene	0.7		< 0.7	< 10	< 10	< 10
trans-1,3-Dichloropropene	5		< 5	< 10	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10 J	< 10	< 10
Tetrachloroethene	5		< 5	< 10	< 10	< 10
1,1,2,2-Tetrachloroethane	5		< 5	< 10	< 10	< 10
Toluene	5		< 5	< 10	< 10	< 10
Chlorobenzene	5		< 5	< 10	< 10	< 10
Ethylbenzene	5		< 5	< 10	< 10	< 10
Styrene	5		< 5	< 10	< 10	< 10
Xylene (total)	5		< 5	< 10	< 10	< 10
Total VOCs			0	0	7	10

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
[ ]	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-21S GM-21S 05/14/97	GM-21S GM-21S 9/14/99	GM-21S MW-21S 12/1/99	GM-21S GM-21S 3/15/00
Chloromethane	5		< 10	< 5 J	< 5	< 10
Bromomethane	5		< 10	< 5	< 5	< 10
Vinyl chloride	2		< 10	< 2	< 2	< 1
Chloroethane	5		< 10	< 5	< 5	< 10
Methylene chloride	5		< 10	< 5	< 5	< 10
Acetone	50		< 10 J	< 10	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 5	< 5	< 10
1,1-Dichloroethane	5		< 10	< 5	< 5	< 10
1,2-Dichloroethene (total)	5		< 10	< 5	< 5	< 10
Chloroform	7		< 10	< 7	< 7	< 10
1,2-Dichloroethane	5		< 10 J	< 5	< 5	< 10
2-Butanone	50		< 10	< 10	**5 J**	< 10 J
1,1,1-Trichloroethane	5		< 10	< 5	< 5	< 10
Carbon tetrachloride	5		< 10	< 5	< 5	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 5	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Trichloroethene	5		< 10	< 5	< 5	< 10
Dibromochloromethane	5		< 10	< 5	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 5	< 5	< 10
Benzene	0.7		< 10	< 0.7	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10 J
4-Methyl-2-pentanone	50		< 10 J	< 10	**1 J**	< 10
2-Hexanone	50		< 10 J	< 10	**1 J**	< 10
Tetrachloroethene	5		< 10	< 5	< 5	< 10
1,1,2,2-Tetrachloroethane	5		< 10 J	< 5	< 5	< 10
Toluene	5		< 10	< 5	< 5	< 10
Chlorobenzene	5		< 10	< 5	< 5	< 10
Ethylbenzene	5		< 10	< 5	< 5	< 10
Styrene	5		< 10	< 5	**0.2 J**	< 10
Xylene (total)	5		< 10	< 5	**0.5 J**	< 10
Total VOCs			0	0	7.7	0

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-21S GM-21S 6/26/00	MW-03R MW-3R 12/1/99	MW-03R MW-3R 3/13/00	MW-03R MW-3R 7/31/00
Chloromethane	5		< 10	< 5	< 10	< 10
Bromomethane	5		< 10	< 5	< 10	< 10
Vinyl chloride	2		< 0.3	< 2	< 1	R
Chloroethane	5		< 10	< 5	< 10	< 10
Methylene chloride	5		< 10	< 5	< 10	R
Acetone	50		< 10 J	< 10	< 10 J	< 10
Carbon disulfide	50		< 10 J	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 5	< 10	R
1,1-Dichloroethane	5		< 10	< 5	< 10	< 10
1,2-Dichloroethene (total)	5		< 10	**2 J**	< 10	**2 J**
Chloroform	7		< 10	< 7	< 10	< 10
1,2-Dichloroethane	5		< 10	< 5	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 5	< 10	< 10
Carbon tetrachloride	5		< 10	< 5	< 10	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 5	< 10	< 10
cis-1,3-Dichloropropene	5		R	< 5	< 10 J	R
Trichloroethene	5		**3 J**	**11**	**6 J**	**12**
Dibromochloromethane	5		< 10	< 5	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 5	< 10	< 10
Benzene	0.7		< 10	< 0.7	< 10	R
trans-1,3-Dichloropropene	5		< 10	< 5	< 10 J	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		**2 J**	**1 J**	< 10	**1 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 5	< 10	**0.8 J**
Toluene	5		**0.6 J**	< 5	< 10	**0.3 J**
Chlorobenzene	5		< 10	< 5	< 10	< 10
Ethylbenzene	5		< 10	< 5	< 10	< 10
Styrene	5		< 10	< 5	< 10	< 10
Xylene (total)	5		< 10	< 5	< 10	< 10
Total VOCs			**5.6**	**14**	**6**	**16.1**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
[ ]	Value exceeds associated SCG value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Shallow Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	FW-01 FW-01I 7/10/00	FW-03 FW-03 6/28/00
Chloromethane	5		< 10	< 10
Bromomethane	5		< 10 J	< 10
Vinyl chloride	2		< 0.3	< 0.3
Chloroethane	5		< 10	< 10 J
Methylene chloride	5		< 10	< 10
Acetone	50		< 10	< 10
Carbon disulfide	50		< 10	< 10 J
1,1-Dichloroethene	5		< 10	< 10
1,1-Dichloroethane	5		**2 J**	**2 J**
1,2-Dichloroethene (total)	5		**20**	< 10
Chloroform	7		< 10	< 10
1,2-Dichloroethane	5		< 10	< 10
2-Butanone	50		< 10	< 10
1,1,1-Trichloroethane	5		**2 J**	**32**
Carbon tetrachloride	5		< 10	< 10
Bromodichloromethane	50		< 10	< 10
1,2-Dichloropropane	5		< 10	< 10
cis-1,3-Dichloropropene	5		< 10	R
Trichloroethene	5		**25**	**2 J**
Dibromochloromethane	5		< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 10
Benzene	0.7		< 10	< 10
trans-1,3-Dichloropropene	5		< 10	< 10
Bromoform	50		< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10
2-Hexanone	50		< 10	< 10
Tetrachloroethene	5		**74**	**2 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 10
Toluene	5		< 10	< 10
Chlorobenzene	5		< 10	< 10
Ethylbenzene	5		< 10	< 10
Styrene	5		< 10	< 10
Xylene (total)	5		< 10	< 10
Total VOCs			**123**	**38**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
R	Unusable data
[ ]	Value exceeds associated SCG value.

Table 10. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, 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 / 05/14/97	GM-15I / GM-15I / 9/13/99	GM-15I / GM-15I / 12/7/99	GM-15I / GM-15I / 3/23/00
Chloromethane	5		< 10	< 5 J	< 10	< 10
Bromomethane	5		< 10	< 5	< 10	< 10 J
Vinyl chloride	2		< 10	< 2	< 0.3	< 1
Chloroethane	5		< 10	< 5	< 10	< 10
Methylene chloride	5		< 10	< 5	< 10	< 10
Acetone	50		< 10	< 10	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 5	< 10	< 10
1,1-Dichloroethane	5		< 10	< 5	**0.5 J**	< 10
1,2-Dichloroethene (total)	5		< 10	< 5	**2 J**	**1 J**
Chloroform	7		< 10	< 7	< 10	< 10
1,2-Dichloroethane	5		< 10 J	< 5	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 5	< 10	< 10
Carbon tetrachloride	5		< 10	< 5	< 10	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 5	< 10	< 10
cis-1,3-Dichloropropene	5		< 10	< 5	< 10	< 10
Trichloroethene	5		< 10	< 5	< 10	< 10
Dibromochloromethane	5		< 10	< 5	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 5	< 10	< 10
Benzene	0.7		< 10	< 0.7	< 10	< 10
trans-1,3-Dichloropropene	5		< 10	< 5	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10 J	< 10	< 10	< 10
2-Hexanone	50		< 10 J	< 10	< 10	< 10
Tetrachloroethene	5		< 10	< 5	< 10	< 10
1,1,2,2-Tetrachloroethane	5		< 10 J	< 5	< 10	< 10
Toluene	5		< 10	< 5	< 10	< 10
Chlorobenzene	5		< 10	< 5	< 10	< 10
Ethylbenzene	5		< 10	< 5	< 10	< 10
Styrene	5		< 10	< 5	< 10	< 10
Xylene (total)	5		< 10	< 5	< 10	< 10
Total VOCs			0	0	**2.5**	**1**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 10. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, 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 / 7/11/00	GM-16I / GM-16I / 12/7/99	GM-16I / GM-16I / 3/15/00	GM-16I / GM-16I / 7/17/00
Chloromethane	5		< 10	< 10	< 10 J	< 10
Bromomethane	5		< 10 J	< 10	< 10	< 10 J
Vinyl chloride	2		< 0.3	< 0.3	< 1	< 0.3
Chloroethane	5		< 10	< 10	< 10	< 10
Methylene chloride	5		< 10	< 10	< 10	< 10
Acetone	50		< 10	< 10	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 10	< 10	< 10
1,1-Dichloroethane	5		< 10	**0.3 J**	< 10	< 10
1,2-Dichloroethene (total)	5		< 10	**0.7 J**	< 10	< 10
Chloroform	7		< 10	< 10	< 10	< 10
1,2-Dichloroethane	5		< 10	< 10	< 10	< 10
2-Butanone	50		< 10	< 10	< 10 J	< 10
1,1,1-Trichloroethane	5		< 10	< 10	< 10	< 10
Carbon tetrachloride	5		< 10	< 10	< 10	< 10 J
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene	5		< 10	< 10	< 10	< 10
Trichloroethene	5		< 10	**24**	**28**	**22 J**
Dibromochloromethane	5		< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 10	< 10
Benzene	0.7		< 10	< 10	< 10	< 10
trans-1,3-Dichloropropene	5		< 10	< 10	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		**3 J**	**2 J**	**1 J**	**2 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 10	< 10	R
Toluene	5		< 10	< 10	< 10	< 10
Chlorobenzene	5		< 10	< 10	< 10	< 10
Ethylbenzene	5		< 10	< 10	< 10	< 10
Styrene	5		< 10	< 10	< 10	< 10
Xylene (total)	5		< 10	< 10	< 10	< 10
Total VOCs			**3**	**27**	**29**	**24**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 10. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-18I GM-18I 7/17/00	GM-20I GM-20I 5/14/97	GM-20I GM-20I 9/9/99	GM-20I GM-20I 12/6/99
Chloromethane	5		< 10	< 10	< 5	< 5
Bromomethane	5		< 10	< 10	< 5	< 5
Vinyl chloride	2		< 0.3	< 10	< 2	< 2
Chloroethane	5		< 10	< 10	< 5	< 5
Methylene chloride	5		< 10	< 10	< 5	< 5
Acetone	50		< 10	< 10	< 10	< 15
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 10	< 5	< 5
1,1-Dichloroethane	5		< 10	< 10	< 5	< 5
1,2-Dichloroethene (total)	5		< 10	< 10	< 5	< 5
Chloroform	7		< 10	< 10	< 7	< 7
1,2-Dichloroethane	5		< 10	< 10	< 5	< 5
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 10	< 5	< 5
Carbon tetrachloride	5		< 10	< 10	< 5	< 5
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 5	< 5
cis-1,3-Dichloropropene	5		< 10	< 10	< 5	< 5
Trichloroethene	5		< 10	1	1 J	1 J
Dibromochloromethane	5		< 10	< 10	< 5	< 5
1,1,2-Trichloroethane	5		< 10	< 10	< 5	< 5
Benzene	0.7		< 10	< 10	< 0.7	< 0.7
trans-1,3-Dichloropropene	5		< 10	< 10	< 5	< 5
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 10	< 10	< 5	< 5
1,1,2,2-Tetrachloroethane	5		R	< 10	< 5	< 5
Toluene	5		< 10	< 10	< 5	< 5
Chlorobenzene	5		< 10	< 10	< 5	< 5
Ethylbenzene	5		< 10	< 10	< 5	< 5
Styrene	5		< 10	< 10	< 5	< 5
Xylene (total)	5		< 10	< 10	< 5	< 5
Total VOCs			0	1	1	1

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 10. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-20I GM-20I 3/23/00	GM-20I GM-20I 7/11/00	GM-21I GM-21I 05/14/97	GM-21I GM-21I 9/9/99
Chloromethane	5		< 10	< 10	< 10	< 5
Bromomethane	5		< 10 J	< 10 J	< 10	< 5
Vinyl chloride	2		< 1	< 0.3	< 10	< 2
Chloroethane	5		< 10	< 10	< 10	< 5
Methylene chloride	5		< 10	< 10	< 10	< 5
Acetone	50		< 10 J	< 10	< 10 J	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 10	< 10	< 5
1,1-Dichloroethane	5		< 10	< 10	< 10	< 5
1,2-Dichloroethene (total)	5		< 10	< 10	< 10	< 5
Chloroform	7		< 10	< 10	< 10	< 7
1,2-Dichloroethane	5		< 10	< 10	< 10 J	< 5
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 10	< 10	< 5
Carbon tetrachloride	5		< 10	< 10	< 10	< 5
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 10	< 5
cis-1,3-Dichloropropene	5		< 10	< 10	< 10	< 5
Trichloroethene	5		< 10	< 10	< 10	< 5
Dibromochloromethane	5		< 10	< 10	< 10	< 5
1,1,2-Trichloroethane	5		< 10	< 10	< 10	< 5
Benzene	0.7		< 10	< 10	< 10	< 0.7
trans-1,3-Dichloropropene	5		< 10	< 10	< 10	< 5
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10 J	< 10
2-Hexanone	50		< 10	< 10	< 10 J	< 10
Tetrachloroethene	5		**6 J**	< 10	< 10	< 5
1,1,2,2-Tetrachloroethane	5		< 10	< 10	< 10 J	< 5
Toluene	5		< 10	< 10	< 10	< 5
Chlorobenzene	5		< 10	< 10	< 10	< 5
Ethylbenzene	5		< 10	< 10	< 10	< 5
Styrene	5		< 10	< 10	< 10	< 5
Xylene (total)	5		< 10	< 10	< 10	< 5
Total VOCs			**6**	**0**	0	0

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 10. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-21I GM-21I 12/3/99	GM-21I GM-21I 3/17/00	GM-21I GM-21I 7/10/00	HN-24I HN24I 12/2/99
Chloromethane	5		< 5	< 10 J	< 10	< 20
Bromomethane	5		< 5	< 10	< 10 J	< 20
Vinyl chloride	2		< 2	< 1	< 0.3	< 0.7
Chloroethane	5		< 5	< 10	< 10	< 20
Methylene chloride	5		< 5	< 10	< 10	< 20
Acetone	50		< 10	< 10	< 10	< 20
Carbon disulfide	50		< 10	< 10	< 10	< 20
1,1-Dichloroethene	5		< 5	< 10	< 10	**22**
1,1-Dichloroethane	5		< 5	< 10	< 10	**22**
1,2-Dichloroethene (total)	5		< 5	< 10	< 10	**50**
Chloroform	7		< 7	< 10	< 10	**0.9 J**
1,2-Dichloroethane	5		< 5	< 10	< 10	< 20
2-Butanone	50		1 J	< 10 J	< 10	< 20
1,1,1-Trichloroethane	5		< 5	< 10	< 10	**21**
Carbon tetrachloride	5		< 5	< 10	< 10	< 20
Bromodichloromethane	50		< 10	< 10	< 10	< 20
1,2-Dichloropropane	5		< 5	< 10	< 10	< 20
cis-1,3-Dichloropropene	5		< 5	< 10	< 10	< 20
Trichloroethene	5		< 5	< 10	< 10	**230**
Dibromochloromethane	5		< 5	< 10	< 10	< 20
1,1,2-Trichloroethane	5		< 5	< 10	< 10	1 J
Benzene	0.7		< 0.7	< 10	< 10	< 20
trans-1,3-Dichloropropene	5		< 5	< 10	< 10	< 20
Bromoform	50		< 10	< 10	< 10	< 20
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 20
2-Hexanone	50		< 10	< 10	< 10	< 20
Tetrachloroethene	5		< 5	< 10	< 10	**16 J**
1,1,2,2-Tetrachloroethane	5		< 5	< 10	< 10	< 20
Toluene	5		< 5	< 10	< 10	< 20
Chlorobenzene	5		< 5	< 10	< 10	< 20
Ethylbenzene	5		< 5	< 10	< 10	< 20
Styrene	5		< 5	< 10	< 10	< 20
Xylene (total)	5		< 5	< 10	< 10	< 20
Total VOCs			1	0	0	362.9

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 10. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	HN-24I HN-24I 3/22/00	HN-24I HW24I 6/28/00	HN-28I HN-28I 7/6/00	HN-29I HW29I 6/28/00
Chloromethane	5		< 10	< 10	< 10	< 10
Bromomethane	5		< 10	< 10	< 10	< 10
Vinyl chloride	2		< 1	< 0.3	< 0.3	< 0.3
Chloroethane	5		< 10	< 10 J	< 10	< 10 J
Methylene chloride	5		< 10	< 10	< 10	< 10
Acetone	50		< 10	< 10	< 10	< 10
Carbon disulfide	50		< 10	< 10 J	< 10	< 10 J
1,1-Dichloroethene	5		**21**	**16**	< 10	< 10
1,1-Dichloroethane	5		**17**	**11**	< 10	< 10
1,2-Dichloroethene (total)	5		**38**	**24**	< 10	< 10
Chloroform	7		< 10	< 10	< 10	< 10
1,2-Dichloroethane	5		< 10	< 10	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		**19 J**	**15**	< 10	< 10
Carbon tetrachloride	5		< 10 J	< 10	< 10	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene	5		< 10	R	< 10	R
Trichloroethene	5		**270 D**	**180**	**7 J**	**2 J**
Dibromochloromethane	5		< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 10	< 10
Benzene	0.7		< 10	< 10	< 10	< 10
trans-1,3-Dichloropropene	5		< 10	< 10	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		**14**	**9 J**	**1 J**	< 10
1,1,2,2-Tetrachloroethane	5		< 10	< 10	< 10	< 10
Toluene	5		< 10	< 10	< 10	< 10
Chlorobenzene	5		< 10	< 10	< 10	< 10
Ethylbenzene	5		< 10	< 10	< 10	< 10
Styrene	5		< 10	< 10	< 10	< 10
Xylene (total)	5		< 10	< 10	< 10	< 10
Total VOCs			**379**	**255**	**8**	**2**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	10627 / 10627 / 9/14/99	10627 / N-10627 / 12/1/99	10627 / N-10627 / 3/22/00	10627 / N-10627 / 7/5/00
Chloromethane	5		< 5 J	< 5	< 10	< 10
Bromomethane	5		< 5	< 5	< 10	< 10
Vinyl chloride	2		< 2	< 2	< 1	< 0.3
Chloroethane	5		< 5	< 5	< 10	< 10
Methylene chloride	5		< 5	< 5	< 10	< 10
Acetone	50		< 10	< 10	< 10	**5 J**
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 5	< 5	< 10	< 10
1,1-Dichloroethane	5		< 5	< 5	< 10	< 10
1,2-Dichloroethene (total)	5		< 5	**1 J**	< 10	< 10
Chloroform	7		< 7	< 7	< 10	< 10
1,2-Dichloroethane	5		< 5	< 5	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 5	< 5	< 10 J	< 10
Carbon tetrachloride	5		< 5	< 5	< 10 J	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 5	< 5	< 10	< 10
cis-1,3-Dichloropropene	5		< 5	< 5	< 10	< 10
Trichloroethene	5		**8**	**24**	**2 J**	**7 J**
Dibromochloromethane	5		< 5	< 5	< 10	< 10
1,1,2-Trichloroethane	5		< 5	< 5	< 10	< 10
Benzene	0.7		< 0.7	< 0.7	< 10	< 10
trans-1,3-Dichloropropene	5		< 5	< 5	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 5	**0.9 J**	< 10	< 10
1,1,2,2-Tetrachloroethane	5		< 5	< 5	< 10	< 10
Toluene	5		< 5	< 5	< 10	< 10
Chlorobenzene	5		< 5	< 5	< 10	< 10
Ethylbenzene	5		< 5	< 5	< 10	< 10
Styrene	5		< 5	< 5	< 10	< 10
Xylene (total)	5		**2 J**	**0.7 J**	< 10	< 10
Total VOCs			**10**	**26.6**	**2**	**12**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL:	10627**	GM-13D	GM-13D	GM-13D
		SAMPLE ID:	REP-1	GM-13D	GM-13D	GM-13D
		DATE:	7/5/00	12/7/99	3/23/00	7/11/00
Chloromethane	5		< 10	< 100	< 10	< 100
Bromomethane	5		< 10	< 100	< 10 J	< 100 J
Vinyl chloride	2		< 0.3	< 3	< 1	< 3
Chloroethane	5		< 10	< 100	< 10	< 100
Methylene chloride	5		< 10	< 100	< 10	< 100
Acetone	50		4 J	< 100	< 10 J	< 100 J
Carbon disulfide	50		< 10	< 100	< 10	< 100
1,1-Dichloroethene	5		< 10	94 J	120	140
1,1-Dichloroethane	5		< 10	46 J	58	57 J
1,2-Dichloroethene (total)	5		< 10	220	290	260
Chloroform	7		< 10	2 J	2 J	< 100
1,2-Dichloroethane	5		< 10	< 100	1 J	< 100
2-Butanone	50		< 10	< 100 J	< 10	< 100
1,1,1-Trichloroethane	5		< 10	87 J	110	130
Carbon tetrachloride	5		< 10	< 100	< 10	< 100 J
Bromodichloromethane	50		< 10	< 100	< 10	< 100
1,2-Dichloropropane	5		< 10	< 100	< 10	< 100
cis-1,3-Dichloropropene	5		< 10	< 100	< 10	< 100
Trichloroethene	5		7 J	400	520 D	460
Dibromochloromethane	5		< 10	< 100	< 10	< 100
1,1,2-Trichloroethane	5		< 10	< 100	< 10	< 100
Benzene	0.7		< 10	1 J	< 10	< 100
trans-1,3-Dichloropropene	5		< 10	< 100	< 10	< 100
Bromoform	50		< 10	< 100	< 10	< 100
4-Methyl-2-pentanone	50		< 10	< 100	< 10	< 100
2-Hexanone	50		< 10	< 100	< 10	< 100
Tetrachloroethene	5		< 10	830	1300 D	1100
1,1,2,2-Tetrachloroethane	5		< 10	< 100	< 10	< 100
Toluene	5		< 10	2 J	< 10	< 100
Chlorobenzene	5		< 10	< 100	< 10	< 100
Ethylbenzene	5		< 10	< 100	< 10	< 100
Styrene	5		< 10	< 100	< 10	< 100
Xylene (total)	5		< 10	< 100	< 10	< 100
Total VOCs			11	1,682	2,401	2,147

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-20D GM-20D 5/14/97	GM-20D GM-20D 9/9/99	GM-20D GM-20D 12/6/99	GM-20D GM-20D 3/17/00
Chloromethane	5		< 10	< 5	< 5	< 10 J
Bromomethane	5		< 10	< 5	< 5	< 10
Vinyl chloride	2		< 10	< 2	< 2	< 1
Chloroethane	5		< 10	< 5	< 5	< 10
Methylene chloride	5		< 10	< 5	< 5	< 10
Acetone	50		< 10 J	< 10	< 10	< 10
Carbon disulfide	50		< 10	< 10	**0.7 J**	< 10
1,1-Dichloroethene	5		< 10	< 5	< 5	< 10
1,1-Dichloroethane	5		< 10	< 5	< 5	< 10
1,2-Dichloroethene (total)	5		< 10	< 5	< 5	< 10
Chloroform	7		< 10	< 7	< 7	< 10
1,2-Dichloroethane	5		< 10 J	< 5	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10 J
1,1,1-Trichloroethane	5		< 10	< 5	< 5	< 10
Carbon tetrachloride	5		< 10	< 5	< 5	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 5	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Trichloroethene	5		< 10	< 5	< 5	< 10
Dibromochloromethane	5		< 10	< 5	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 5	< 5	< 10
Benzene	0.7		< 10	< 0.7	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10 J	< 10	< 10	< 10
2-Hexanone	50		< 10 J	< 10	< 10	< 10
Tetrachloroethene	5		< 10	< 5	< 5	< 10
1,1,2,2-Tetrachloroethane	5		< 10 J	< 5	< 5	< 10
Toluene	5		< 10	< 5	< 5	< 10
Chlorobenzene	5		< 10	< 5	< 5	< 10
Ethylbenzene	5		< 10	< 5	< 5	< 10
Styrene	5		< 10	< 5	< 5	< 10
Xylene (total)	5		< 10	< 5	< 5	< 10
Total VOCs			0	0	**0.7**	0

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-20D GM-20D 7/11/00	GM-34D GW-34D 9/14/99	GM-34D GM-34D 11/30/99	GM-34D GM-34D 3/20/00
Chloromethane	5		< 10	< 5 J	< 5 J	< 10
Bromomethane	5		< 10 J	< 5	< 5	< 10 J
Vinyl chloride	2		< 0.3	< 2	< 2 J	< 1
Chloroethane	5		< 10	< 5	< 5	< 10
Methylene chloride	5		< 10	< 5	< 5 J	< 10
Acetone	50		< 10	< 10	< 10 J	< 10 J
Carbon disulfide	50		< 10	< 10	< 10 J	< 10
1,1-Dichloroethene	5		< 10	**4 J**	**5**	**3 J**
1,1-Dichloroethane	5		< 10	**4 J**	**4 J**	**4 J**
1,2-Dichloroethene (total)	5		< 10	**3 J**	**3 J**	**3 J**
Chloroform	7		< 10	< 7	**0.8 J**	< 10
1,2-Dichloroethane	5		< 10	< 5	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 5	**0.6 J**	< 10
Carbon tetrachloride	5		< 10	< 5	< 5	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 5	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Trichloroethene	5		< 10	**81**	**72**	**100**
Dibromochloromethane	5		< 10	< 5	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 5	< 5	< 10
Benzene	0.7		< 10	< 0.7	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 10	**5**	**3 J**	**4 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 5	< 5	< 10
Toluene	5		< 10	< 5	< 5	< 10
Chlorobenzene	5		< 10	< 5	< 5	< 10
Ethylbenzene	5		< 10	< 5	**0.3 J**	< 10
Styrene	5		< 10	< 5	< 5	< 10
Xylene (total)	5		< 10	**0.9 J**	**1 J**	< 10
Total VOCs			**0**	**97.9**	**89.7**	**114**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL:	GM-34D	GM-36D	GM-36D	GM-36D
		SAMPLE ID:	GM-34D	GM-36D	GM-36D	GM-36D
		DATE:	7/5/00	9/2/99	12/10/99	3/27/00
Chloromethane	5		< 10	< 5	< 5	< 10
Bromomethane	5		< 10	< 5	< 5	< 10
Vinyl chloride	2		< 0.3	< 2	< 2	< 1
Chloroethane	5		< 10	< 5	< 5	< 10
Methylene chloride	5		< 10	< 5	< 5	< 10
Acetone	50		< 10	< 10 J	< 10	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		**4 J**	< 5	< 5	< 10
1,1-Dichloroethane	5		**4 J**	< 5	< 5	< 10
1,2-Dichloroethene (total)	5		**4 J**	**0.4 J**	**0.6 J**	< 10
Chloroform	7		< 10	< 7	< 7	< 10
1,2-Dichloroethane	5		< 10	< 5	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		**0.7 J**	< 5	< 5	< 10 J
Carbon tetrachloride	5		< 10	< 5	< 5	< 10 J
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 5	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Trichloroethene	5		**88**	**36**	**52**	**54**
Dibromochloromethane	5		< 10	< 5	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 5	< 5	< 10
Benzene	0.7		< 10	< 0.7	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 5	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10 J	< 10	< 10
Tetrachloroethene	5		**4 J**	**2 J**	**3 J**	**2 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 5	< 5	< 10
Toluene	5		< 10	< 5	< 5	< 10
Chlorobenzene	5		< 10	< 5	< 5	< 10
Ethylbenzene	5		< 10	< 5	< 5	< 10
Styrene	5		< 10	< 5	< 5	< 10
Xylene (total)	5		< 10	< 5	< 5	< 10
Total VOCs			**104.7**	**38.4**	**55.6**	**56**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-36D GM-36D 7/14/00	GM-37D GM-37D 05/15/97	GM-37D GM-37D 9/7/99	GM-37D GM-37D 1/6/00
Chloromethane	5		< 10	< 10	< 5	< 10
Bromomethane	5		< 10 J	< 10	< 5	< 10
Vinyl chloride	2		< 0.3	< 10	< 2	< 0.3
Chloroethane	5		< 10	< 10	< 5	< 10
Methylene chloride	5		< 10	< 10	< 5	< 10
Acetone	50		< 10 J	< 10	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	**4 J**	**6**	**4 J**
1,1-Dichloroethane	5		< 10	**10**	**9**	**8 J**
1,2-Dichloroethene (total)	5		< 10	< 10	**7**	< 10
Chloroform	7		< 10	< 10	< 7	< 10
1,2-Dichloroethane	5		< 10	< 10 J	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	**6 J**	**5**	**4 J**
Carbon tetrachloride	5		< 10 J	< 10	< 5	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 10	< 5	< 10
Trichloroethene	5		**24 J**	**6 J**	**9**	**0.5 J**
Dibromochloromethane	5		< 10	< 10	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 5	< 10
Benzene	0.7		< 10	< 10	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 10	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10 J	< 10	< 10
2-Hexanone	50		< 10	< 10 J	< 10	< 10
Tetrachloroethene	5		< 10	**0.6 J**	**2 J**	**1 J**
1,1,2,2-Tetrachloroethane	5		R	< 10 J	< 5	< 10
Toluene	5		< 10	< 10	**3 J**	< 10
Chlorobenzene	5		< 10	< 10	< 5	< 10
Ethylbenzene	5		< 10	< 10	< 5	< 10
Styrene	5		< 10	< 10	< 5	< 10
Xylene (total)	5		< 10	< 10	< 5	< 10
Total VOCs			**24**	**26.6**	**41**	**17.5**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-37D GM-37D 3/27/00	GM-37D GM-37D 7/13/00	GM-38D GM-38D 9/1/99	GM-38D GM-38D 12/8/99
Chloromethane	5		< 10	< 10	< 25	< 50
Bromomethane	5		< 10	< 10 J	< 25	< 50
Vinyl chloride	2		< 1	< 0.3	< 10	< 20
Chloroethane	5		< 10	< 10	< 25	< 50
Methylene chloride	5		< 10	< 10	**3 J**	< 50
Acetone	50		< 10	< 10 J	< 50 J	< 100
Carbon disulfide	50		< 10	< 10	**1 J**	< 100
1,1-Dichloroethene	5		**3 J**	**4 J**	**5 J**	< 50
1,1-Dichloroethane	5		**9 J**	**9 J**	< 25	**3 J**
1,2-Dichloroethene (total)	5		< 10	< 10	**3 J**	< 50
Chloroform	7		< 10	< 10	< 35	< 70
1,2-Dichloroethane	5		< 10	< 10	< 25	< 50
2-Butanone	50		< 10	< 10	< 50	< 100
1,1,1-Trichloroethane	5		**4 J**	**6 J**	**4 J**	**4 J**
Carbon tetrachloride	5		< 10 J	< 10 J	< 25	< 50
Bromodichloromethane	50		< 10	< 10	< 50	< 100
1,2-Dichloropropane	5		< 10	< 10	< 25	< 50
cis-1,3-Dichloropropene	5		< 10	< 10	< 25	< 50
Trichloroethene	5		< 10	< 10	**800**	**930**
Dibromochloromethane	5		< 10	< 10	< 25	< 50
1,1,2-Trichloroethane	5		< 10	< 10	< 25	< 50
Benzene	0.7		< 10	< 10	< 4	< 7
trans-1,3-Dichloropropene	5		< 10	< 10	< 25	< 50
Bromoform	50		< 10	< 10	< 50	< 100
4-Methyl-2-pentanone	50		< 10	< 10	< 50	< 100
2-Hexanone	50		< 10	< 10	< 50 J	< 100
Tetrachloroethene	5		**1 J**	**2 J**	< 25	< 50
1,1,2,2-Tetrachloroethane	5		< 10	R	< 25	< 50
Toluene	5		< 10	< 10	**0.4 J**	**3 J**
Chlorobenzene	5		< 10	< 10	< 25	< 50
Ethylbenzene	5		< 10	< 10	< 25	< 50
Styrene	5		< 10	< 10	< 25	< 50
Xylene (total)	5		< 10	< 10	< 25	< 50
Total VOCs			**17**	**21**	**816.4**	**940**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-38D GM-38D 3/28/00	GM-38D GM-38D 7/12/00	HN-29D HN29D 12/2/99	HN-29D HN-29D 3/22/00
Chloromethane	5		< 10	< 50	< 10	< 10
Bromomethane	5		< 10	< 50 J	< 10	< 10
Vinyl chloride	2		< 1	< 2	< 0.3	< 1
Chloroethane	5		< 10	< 50	< 10	< 10
Methylene chloride	5		< 10	< 50	< 10	< 10
Acetone	50		< 10	< 50	< 10	< 10
Carbon disulfide	50		< 10	< 50	< 10	< 10
1,1-Dichloroethene	5		**6 J**	< 50	< 10	< 10
1,1-Dichloroethane	5		**3 J**	< 50	**0.3 J**	< 10
1,2-Dichloroethene (total)	5		**2 J**	< 50	< 10	< 10
Chloroform	7		< 10	< 50	< 10	< 10
1,2-Dichloroethane	5		< 10	< 50	< 10	< 10
2-Butanone	50		< 10	< 50	< 10	< 10
1,1,1-Trichloroethane	5		**5 J**	< 50	< 10	< 10 J
Carbon tetrachloride	5		< 10 J	< 50	< 10	< 10 J
Bromodichloromethane	50		< 10	< 50	< 10	< 10
1,2-Dichloropropane	5		< 10	< 50	< 10	< 10
cis-1,3-Dichloropropene	5		< 10	< 50	< 10	< 10
Trichloroethene	5		**1200 D**	**660 J**	**1 J**	< 10
Dibromochloromethane	5		< 10	< 50	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 50	< 10	< 10
Benzene	0.7		< 10	< 50	< 10	< 10
trans-1,3-Dichloropropene	5		< 10	< 50	< 10	< 10
Bromoform	50		< 10	< 50	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 50	< 10	< 10
2-Hexanone	50		< 10	< 50	< 10	< 10
Tetrachloroethene	5		1 J	< 50	< 10	< 10
1,1,2,2-Tetrachloroethane	5		< 10	R	< 10	< 10
Toluene	5		< 10	< 50	< 10	< 10
Chlorobenzene	5		< 10	< 50	< 10	< 10
Ethylbenzene	5		< 10	< 50	< 10	< 10
Styrene	5		< 10	< 50	< 10	< 10
Xylene (total)	5		< 10	< 50	< 10	< 10
Total VOCs			**1,217**	**660**	**1.3**	0

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 11. Concentrations of Volatile Organic Compounds Detected in Deep Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	HN-29D HN-29D 7/6/00	
Chloromethane	5	<	10	
Bromomethane	5	<	10	
Vinyl chloride	2	<	0.3	
Chloroethane	5	<	10	
Methylene chloride	5	<	10	
Acetone	50	<	10	
Carbon disulfide	50	<	10	
1,1-Dichloroethene	5	<	10	
1,1-Dichloroethane	5	<	10	
1,2-Dichloroethene (total)	5	<	10	
Chloroform	7	<	10	
1,2-Dichloroethane	5	<	10	
2-Butanone	50	<	10	
1,1,1-Trichloroethane	5	<	10	
Carbon tetrachloride	5	<	10	
Bromodichloromethane	50	<	10	
1,2-Dichloropropane	5	<	10	
cis-1,3-Dichloropropene	5	<	10	
Trichloroethene	5		**0.9**	**J**
Dibromochloromethane	5	<	10	
1,1,2-Trichloroethane	5	<	10	
Benzene	0.7	<	10	
trans-1,3-Dichloropropene	5	<	10	
Bromoform	50	<	10	
4-Methyl-2-pentanone	50	<	10	
2-Hexanone	50	<	10	
Tetrachloroethene	5	<	10	
1,1,2,2-Tetrachloroethane	5	<	10	
Toluene	5	<	10	
Chlorobenzene	5	<	10	
Ethylbenzene	5	<	10	
Styrene	5	<	10	
Xylene (total)	5	<	10	
Total VOCs			**0.9**	

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
D	Constituent identified at a secondary dilution.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
*	Additional sampling round.
**	Replicate Sample.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-33D2 GM-33D2 05/15/97	GM-33D2 GM-33D2 9/8/99	GM-33D2 GM-33D-2 12/7/99	GM-33D2 GM-33D-2 3/28/00
Chloromethane	5		< 1000 J	< 100	< 100	< 10
Bromomethane	5		< 1000 J	< 100	< 100	< 10
Vinyl chloride	2		< 1000 J	< 40	< 3	< 1
Chloroethane	5		< 1000 J	< 100	< 100	< 10
Methylene chloride	5		< 1000 J	< 100	< 100	< 10
Acetone	50		< 1800 J	< 200	< 100	< 10
Carbon disulfide	50		< 1000 J	< 200	< 100	< 10
1,1-Dichloroethene	5		< 1000 J	< 100	< 100	< 10
1,1-Dichloroethane	5		< 1000 J	< 100	< 100	< 10
1,2-Dichloroethene (total)	5		< 1000 J	< 100	**4 J**	**4 J**
Chloroform	7		< 1000 J	< 140	< 100	< 10
1,2-Dichloroethane	5		< 1000 J	< 100	< 100	< 10
2-Butanone	50		< 1000 J	< 200	< 100	< 10
1,1,1-Trichloroethane	5		< 1000 J	< 100	< 100	< 10 J
Carbon tetrachloride	5		< 1000 J	< 100	< 100	< 10 J
Bromodichloromethane	50		< 1000 J	< 200	< 100	< 10
1,2-Dichloropropane	5		< 1000 J	< 100	< 100	< 10
cis-1,3-Dichloropropene	5		< 1000 J	< 100	< 100	< 10
Trichloroethene	5		**15000 J**	**2200**	**1900**	**1800 D**
Dibromochloromethane	5		< 1000 J	< 100	< 100	< 10
1,1,2-Trichloroethane	5		< 1000 J	< 100	< 100	< 10
Benzene	0.7		< 1000 J	< 14	< 100	< 10
trans-1,3-Dichloropropene	5		< 1000 J	< 100	< 100	< 10
Bromoform	50		< 1000 J	< 200	< 100	< 10
4-Methyl-2-pentanone	50		< 1000 J	< 200	< 100	< 10
2-Hexanone	50		< 1000 J	< 200	< 100	< 10
Tetrachloroethene	5		< 1000 J	**25 J**	**16 J**	**19**
1,1,2,2-Tetrachloroethane	5		< 1000 J	< 100	< 100	< 10
Toluene	5		< 1000 J	< 100	**2 J**	< 10
Chlorobenzene	5		< 1000 J	< 100	< 100	< 10
Ethylbenzene	5		< 1000 J	< 100	< 100	< 10
Styrene	5		< 1000 J	< 100	< 100	< 10
Xylene (total)	5		< 1000 J	< 100	< 100	< 10
Total VOCs			**15,000**	**2,225**	**1,922**	**1,823**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-33D2 GM-33D-2 7/11/00	GM-34D2 GW-34D2 9/14/99	GM-34D2 GM-34D-2 11/30/99	GM-34D2 GM-34D2 3/20/00
Chloromethane	5		< 200	< 5 J	< 5 J	< 10
Bromomethane	5		< 200 J	< 5	< 5	< 10 J
Vinyl chloride	2		< 7	< 2	< 2 J	< 1
Chloroethane	5		< 200	< 5	< 5	< 10
Methylene chloride	5		< 200	< 5	< 5 J	< 10
Acetone	50		80 J	< 10	< 10 J	< 10 J
Carbon disulfide	50		< 200	< 10	< 10 J	< 10
1,1-Dichloroethene	5		< 200	7	8	4 J
1,1-Dichloroethane	5		< 200	< 5	0.8 J	< 10
1,2-Dichloroethene (total)	5		< 200	2 J	2 J	1 J
Chloroform	7		< 200	< 7	0.2 J	< 10
1,2-Dichloroethane	5		< 200	< 5	< 5	< 10
2-Butanone	50		< 200	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 200	1 J	1 J	< 10
Carbon tetrachloride	5		< 200 J	< 5	< 5	< 10
Bromodichloromethane	50		< 200	< 10	< 10	< 10
1,2-Dichloropropane	5		< 200	< 5	< 5	< 10
cis-1,3-Dichloropropene	5		< 200	< 5	< 5	< 10
Trichloroethene	5		2400	52	53	48
Dibromochloromethane	5		< 200	< 5	< 5	< 10
1,1,2-Trichloroethane	5		< 200	< 5	< 5	< 10
Benzene	0.7		< 200	< 0.7	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 200	< 5	< 5	< 10
Bromoform	50		< 200	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 200	< 10	< 10	< 10
2-Hexanone	50		< 200	< 10	< 10	< 10
Tetrachloroethene	5		28 J	8	6	7 J
1,1,2,2-Tetrachloroethane	5		< 200	< 5	< 5	< 10
Toluene	5		< 200	< 5	< 5	< 10
Chlorobenzene	5		< 200	< 5	< 5	< 10
Ethylbenzene	5		< 200	< 5	0.4 J	< 10
Styrene	5		< 200	< 5	< 5	< 10
Xylene (total)	5		< 200	0.7 J	1 J	< 10
Total VOCs			2,508	70.7	72.4	60

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-34D2 GM-34D-2 7/5/00	GM-35D2 GM-35D2 05/16/97	GM-35D2 GM-35D2 9/2/99	GM-35D2 GM-35D-2 1/6/00
Chloromethane	5		< 10	< 10	< 5	< 10
Bromomethane	5		< 10	< 10	< 5	< 10
Vinyl chloride	2		< 0.3	< 10	< 2	< 0.3
Chloroethane	5		< 10	< 10	< 5	< 10
Methylene chloride	5		< 10	< 10	< 5	< 10
Acetone	50		< 10	< 10	< 10 J	2 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		8 J	4 J	4 J	5 J
1,1-Dichloroethane	5		0.9 J	< 10	1 J	< 10
1,2-Dichloroethene (total)	5		2 J	< 10	0.9 J	< 10
Chloroform	7		< 10	< 10	< 7	< 10
1,2-Dichloroethane	5		< 10	< 10 J	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		2 J	2 J	2 J	< 10
Carbon tetrachloride	5		< 10	3 J	3 J	3 J
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 10	< 5	< 10
Trichloroethene	5		75	85	63	76
Dibromochloromethane	5		< 10	< 10	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 5	< 10
Benzene	0.7		< 10	< 10	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 10	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10 J	< 10	< 10
2-Hexanone	50		< 10	< 10 J	< 10 J	< 10
Tetrachloroethene	5		7 J	< 10	0.5 J	< 10
1,1,2,2-Tetrachloroethane	5		< 10	< 10 J	< 5	< 10
Toluene	5		< 10	< 10	0.1 J	< 10
Chlorobenzene	5		< 10	< 10	< 5	< 10
Ethylbenzene	5		< 10	< 10	< 5	< 10
Styrene	5		< 10	< 10	< 5	< 10
Xylene (total)	5		< 10	< 10	< 5	< 10
Total VOCs			94.9	94	74.5	86

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
(1) Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC New York State Department of Environmental Conservation.
** Replicate Sample.
*** This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG Standard, Criteria, and Guidance.
[ ] Value exceeds associated SCG value.
D Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-35D2 GM-35D-2 3/24/00	GM-35D2 GM-35D-2 7/14/00	GM-36D2 GM-36D2 9/2/99	GM-36D2 GM-36D-2 12/10/99
Chloromethane	5		< 10	< 10	< 5	< 5
Bromomethane	5		< 10	< 10	< 5	< 5
Vinyl chloride	2		< 1	< 0.3	< 2	< 2
Chloroethane	5		< 10	< 10	< 5	< 5
Methylene chloride	5		< 10	< 10	< 5	< 5
Acetone	50		< 10	< 10	< 10 J	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		**4 J**	**4 J**	< 5	< 5
1,1-Dichloroethane	5		< 10	< 10	< 5	< 5
1,2-Dichloroethene (total)	5		< 10	< 10	< 5	< 5
Chloroform	7		< 10	< 10	< 7	< 7
1,2-Dichloroethane	5		< 10	< 10	< 5	< 5
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		**2 J**	**2 J**	< 5	< 5
Carbon tetrachloride	5		**3 J**	< 10	< 5	< 5
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 5	< 5
cis-1,3-Dichloropropene	5		< 10	< 10	< 5	< 5
Trichloroethene	5		**88**	**91 J**	**0.4 J**	**3 J**
Dibromochloromethane	5		< 10	< 10	< 5	< 5
1,1,2-Trichloroethane	5		< 10	< 10	< 5	< 5
Benzene	0.7		< 10	< 10	< 0.7	**0.3 J**
trans-1,3-Dichloropropene	5		< 10	< 10	< 5	< 5
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10 J	< 10
Tetrachloroethene	5		< 10	< 10	< 5	< 5
1,1,2,2-Tetrachloroethane	5		< 10	R	< 5	< 5
Toluene	5		< 10	< 10	< 5	< 5
Chlorobenzene	5		< 10	< 10	< 5	< 5
Ethylbenzene	5		< 10	< 10	< 5	< 5
Styrene	5		< 10	< 10	< 5	< 5
Xylene (total)	5		< 10	< 10	< 5	< 5
Total VOCs			**97**	**97**	**0.4**	**3.3**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-36D2 GM-36D-2 3/28/00	GM-36D2 GM-36D-2 7/14/00	GM-37D2 GM-37D2 9/7/99	GM-37D2 GM-37D-2 1/7/00
Chloromethane	5		< 10	< 10	< 5	< 10
Bromomethane	5		< 10	< 10	< 5	< 10
Vinyl chloride	2		< 1	< 0.3	< 2	< 0.3
Chloroethane	5		< 10	< 10	< 5	< 10
Methylene chloride	5		< 10	< 10	< 5	< 10
Acetone	50		< 10	< 10	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 10	< 5	**2 J**
1,1-Dichloroethane	5		< 10	< 10	**7**	**9 J**
1,2-Dichloroethene (total)	5		< 10	< 10	< 5	< 10
Chloroform	7		< 10	< 10	< 7	< 10
1,2-Dichloroethane	5		< 10	< 10	< 5	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10 J	< 10	< 5	**3 J**
Carbon tetrachloride	5		< 10 J	< 10	< 5	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 5	< 10
cis-1,3-Dichloropropene	5		< 10	< 10	< 5	< 10
Trichloroethene	5		< 10	< 10	**3 J**	**2 J**
Dibromochloromethane	5		< 10	< 10	< 5	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 5	< 10
Benzene	0.7		< 10	< 10	< 0.7	< 10
trans-1,3-Dichloropropene	5		< 10	< 10	< 5	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 10	< 10	< 5	< 10
1,1,2,2-Tetrachloroethane	5		< 10	R	< 5	< 10
Toluene	5		< 10	< 10	< 5	< 10
Chlorobenzene	5		< 10	< 10	< 5	< 10
Ethylbenzene	5		< 10	< 10	< 5	< 10
Styrene	5		< 10	< 10	< 5	< 10
Xylene (total)	5		< 10	< 10	< 5	< 10
Total VOCs			0	0	**10**	**16**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL:	GM-37D2	GM-37D2	GM-38D2	GM-38D2
		SAMPLE ID:	GM-37D-2	GM-37D-2	GM-38D2	GM-38D-2
		DATE:	3/27/00	7/13/00	9/1/99	12/8/99
Chloromethane	5		< 10	< 10	< 25	< 25
Bromomethane	5		< 10	< 10 J	< 25	< 25
Vinyl chloride	2		< 1	< 0.3	< 10	< 10
Chloroethane	5		< 10	< 10	< 25	< 25
Methylene chloride	5		< 10	< 10	**2 J**	< 25
Acetone	50		< 10	< 10 J	< 50 J	< 100
Carbon disulfide	50		< 10	< 10	< 50	< 50
1,1-Dichloroethene	5		**2 J**	**4 J**	< 25	< 25
1,1-Dichloroethane	5		**11**	**17**	< 25	< 25
1,2-Dichloroethene (total)	5		< 10	< 10	**6 J**	**6 J**
Chloroform	7		**1 J**	< 10	< 35	< 35
1,2-Dichloroethane	5		< 10	< 10	< 25	< 25
2-Butanone	50		< 10	< 10	**26 J**	< 100
1,1,1-Trichloroethane	5		**3 J**	**6 J**	< 25	< 25
Carbon tetrachloride	5		< 10 J	< 10 J	< 25	< 25
Bromodichloromethane	50		< 10	< 10	< 50	< 50
1,2-Dichloropropane	5		< 10	< 10	< 25	< 25
cis-1,3-Dichloropropene	5		< 10	< 10	< 25	< 25
Trichloroethene	5		**2 J**	**2 J**	**620**	**710**
Dibromochloromethane	5		< 10	< 10	< 25	< 25
1,1,2-Trichloroethane	5		< 10	< 10	< 25	< 25
Benzene	0.7		< 10	< 10	< 4	< 4
trans-1,3-Dichloropropene	5		< 10	< 10	< 25	< 25
Bromoform	50		< 10	< 10	< 50	< 50
4-Methyl-2-pentanone	50		< 10	< 10	**7 J**	< 50
2-Hexanone	50		< 10	< 10	**9 J**	< 50
Tetrachloroethene	5		< 10	< 10	< 25	< 25
1,1,2,2-Tetrachloroethane	5		< 10	R	< 25	< 25
Toluene	5		< 10	< 10	< 25	**1 J**
Chlorobenzene	5		< 10	< 10	< 25	< 25
Ethylbenzene	5		< 10	< 10	< 25	< 25
Styrene	5		< 10	< 10	< 25	< 25
Xylene (total)	5		< 10	< 10	< 25	< 25
Total VOCs			**19**	**29**	**670**	**717**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
[ ]	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: / SAMPLE ID: / DATE:	GM-38D2 GM-38D-2 3/28/00	GM-38D2 GM-38D-2 7/12/00	GM-38D2** REP-2 7/12/00	GM-70D2 GM-70D2 05/15/97
Chloromethane	5		< 50	< 50	< 100	< 20
Bromomethane	5		< 50	< 50 J	< 100 J	< 20
Vinyl chloride	2		< 6	< 2	< 3	**70** ***
Chloroethane	5		< 50	< 50	< 100	< 20
Methylene chloride	5		< 50	< 50	< 100	< 20
Acetone	50		**14 J**	< 50	< 100 J	**7 J**
Carbon disulfide	50		< 50	< 50	< 100	< 20
1,1-Dichloroethene	5		< 50	< 50	< 100	**3 J**
1,1-Dichloroethane	5		< 50	< 50	< 100	< 20
1,2-Dichloroethene (total)	5		< 50	**6 J**	< 100	**3 J**
Chloroform	7		< 50	< 50	< 100	**10 J**
1,2-Dichloroethane	5		< 50	< 50	< 100	< 20 J
2-Butanone	50		< 50	< 50	< 100	< 20
1,1,1-Trichloroethane	5		< 50 J	< 50	< 100	< 20
Carbon tetrachloride	5		< 50 J	< 50	< 100 J	< 20
Bromodichloromethane	50		< 50	< 50	< 100	< 20
1,2-Dichloropropane	5		< 50	< 50	< 100	< 20
cis-1,3-Dichloropropene	5		< 50	< 50	< 100	< 20
Trichloroethene	5		**880**	**790 J**	**1000 J**	**200**
Dibromochloromethane	5		< 50	< 50	< 100	< 20
1,1,2-Trichloroethane	5		< 50	< 50	< 100	< 20
Benzene	0.7		< 50	< 50	< 100	< 20
trans-1,3-Dichloropropene	5		< 50	< 50	< 100	< 20
Bromoform	50		< 50	< 50	< 100	< 20
4-Methyl-2-pentanone	50		< 50	< 50	< 100	< 20 J
2-Hexanone	50		< 50	< 50	< 100	< 20 J
Tetrachloroethene	5		< 50	< 50	< 100	**10 J**
1,1,2,2-Tetrachloroethane	5		< 50	R	R	< 20
Toluene	5		< 50	< 50	< 100	< 20
Chlorobenzene	5		< 50	< 50	< 100	< 20
Ethylbenzene	5		< 50	< 50	< 100	< 20
Styrene	5		< 50	< 50	< 100	< 20
Xylene (total)	5		< 50	< 50	< 100	< 20
Total VOCs			**894**	**796**	**1,000**	**303**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-70D2 GM-70D2 8/31/99	GM-70D2 GM-70D-2 12/8/99	GM-70D2 GM-70D-2 3/24/00	GM-70D2 GM-70D-2 7/13/00
Chloromethane	5		< 5	< 5	< 10	< 10
Bromomethane	5		< 5	< 5	< 10	< 10 J
Vinyl chloride	2		< 2	< 2	< 1	< 0.3
Chloroethane	5		< 5	< 5	< 10	< 10
Methylene chloride	5		< 5	< 5	< 10	< 10
Acetone	50		< 10 J	< 10	< 10	< 10 J
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 5	< 5	< 10	< 10
1,1-Dichloroethane	5		< 5	< 5	< 10	< 10
1,2-Dichloroethene (total)	5		**2 J**	**1 J**	**1 J**	**1 J**
Chloroform	7		< 7	< 7	< 10	< 10
1,2-Dichloroethane	5		< 5	< 5	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 5	< 5	< 10 J	< 10
Carbon tetrachloride	5		< 5	< 5	< 10 J	< 10 J
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 5	< 5	< 10	< 10
cis-1,3-Dichloropropene	5		< 5	< 5	< 10	< 10
Trichloroethene	5		**75**	**48**	**89**	**54 J**
Dibromochloromethane	5		< 5	< 5	< 10	< 10
1,1,2-Trichloroethane	5		< 5	< 5	< 10	< 10
Benzene	0.7		< 0.7	< 0.7	< 10	< 10
trans-1,3-Dichloropropene	5		< 5	< 5	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10 J	< 10	< 10	< 10
Tetrachloroethene	5		**4 J**	**3 J**	**5 J**	**3 J**
1,1,2,2-Tetrachloroethane	5		< 5	< 5	< 10	R
Toluene	5		< 5	**0.3 J**	< 10	< 10
Chlorobenzene	5		< 5	< 5	< 10	< 10
Ethylbenzene	5		< 5	< 5	< 10	< 10
Styrene	5		< 5	< 5	< 10	< 10
Xylene (total)	5		< 5	< 5	< 10	< 10
Total VOCs			**81**	**52.3**	**95**	**58**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
[ ]	Value *exceeds* associated SCG value.
D	Constituent identified at a secondary dilution.

Table 12. Concentrations of Volatile Organic Compounds Detected in D2 Wells During the Baseline (May 1997), Last Two Quarters 1999, and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards, Criteria, and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-71D2 GM-71D2 8/31/99	GM-71D2 GM-71D-2 12/10/99	GM-71D2 GM-71D-2 3/24/00	GM-71D2 GM-71D-2 7/12/00
Chloromethane	5		< 5	< 5	< 10	< 10
Bromomethane	5		< 5	< 5	< 10	< 10 J
Vinyl chloride	2		< 2	< 2	< 1	< 0.3
Chloroethane	5		< 5	< 5	< 10	< 10
Methylene chloride	5		< 5	< 5	< 10	< 10
Acetone	50		< 18 J	< 10	< 10	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 5	< 5	< 10	< 10
1,1-Dichloroethane	5		< 5	< 5	< 10	< 10
1,2-Dichloroethene (total)	5		< 5	< 5	< 10	< 10
Chloroform	7		**0.7 J**	**0.6 J**	< 10	< 10
1,2-Dichloroethane	5		< 5	< 5	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 5	< 5	< 10 J	< 10
Carbon tetrachloride	5		**1 J**	**1 J**	**1 J**	**2 J**
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 5	< 5	< 10	< 10
cis-1,3-Dichloropropene	5		< 5	< 5	< 10	< 10
Trichloroethene	5		**4 J**	**4 J**	**5 J**	**5 J**
Dibromochloromethane	5		< 5	< 5	< 10	< 10
1,1,2-Trichloroethane	5		< 5	< 5	< 10	< 10
Benzene	0.7		< 0.7	< 0.7	< 10	< 10
trans-1,3-Dichloropropene	5		< 5	< 5	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10 J	< 10	< 10	< 10
Tetrachloroethene	5		< 5	< 5	< 10	< 10
1,1,2,2-Tetrachloroethane	5		< 5	< 5	< 10	< 10
Toluene	5		< 5	< 5	< 10	R
Chlorobenzene	5		< 5	< 5	< 10	< 10
Ethylbenzene	5		< 5	< 5	< 10	< 10
Styrene	5		< 5	< 5	< 10	< 10
Xylene (total)	5		< 5	< 5	< 10	< 10
Total VOCs			**5.7**	**5.6**	**6**	**7**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
(1)	Standards, Criteria, and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
NYSDEC	New York State Department of Environmental Conservation.
**	Replicate Sample.
***	This concentration is considered anomalous because a June 1997 resampling event and subsequent rounds indicated no vinyl chloride was present.
SCG	Standard, Criteria, and Guidance.
	Value exceeds associated SCG value.
D	Constituent identified at a secondary dilution.

Table 13. Concentrations of Tentatively Identified Compounds (TICs) Detected in Groundwater Samples during the Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	WELL: / SAMPLE ID: / DATE:	N-10627 N-10627 07/05/00	GM-16I GM-16I 07/17/00	GM-21I GM-21I 07/10/00	GM-34D GM-34D 07/5/00	GM-34D2 GM-34D2 07/5/00	GM-35D2 GM-35D2 07/14/00	GM-71D2 GM-71D2 07/12/00
Ethane, 1,1,2,-trichloro-1,2,2		--	6 JN	--	32 JN	30 JN	10 JN	--
Ethane, 1,2-Dichloro-1,2,2-T		--	--	--	7 JN	--	--	--
Butylated Hydroxytoluene		7 JNB	--	8 JNB	--	--	--	7 JN

ug/L Micrograms per liter.
J Estimated value.
-- Not Detected.
N TICs are identified based on review of mass spectrometry results via a comprehensive library search of all organic compounds. However calibrations were not run for there constituents, therefore, the results should be used for qualitative purposes only.
B Constituent detected in the Associated Blank sample.

Table 14. Concentrations of Volatile Organic Compounds Detected in Blank Samples Collected During the Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	TRIP BLANK TB062600 6/26/00	TRIP BLANK TB062700 6/27/00	TRIP BLANK TB062800 6/28/00	TRIP BLANK TB070500 7/5/00	TRIP BLANK TB070600 7/6/00
Chloromethane		< 10	< 10	< 10	< 10	< 10
Bromomethane		< 10	< 10	< 10	< 10	< 10
Vinyl chloride		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Chloroethane		< 10	< 10	< 10 J	< 10	< 10
Methylene chloride		**2 J**	**7 J**	**2 J**	**2 JB**	**2 JB**
Acetone		< 10 J	< 10 J	< 10	< 10	< 10
Carbon disulfide		< 10 J	< 10 J	< 10 J	< 10	< 10
1,1-Dichloroethene		< 10	< 10	< 10	< 10	< 10
1,1-Dichloroethane		< 10	< 10	< 10	< 10	< 10
1,2-Dichloroethene (total)		< 10	< 10	< 10	< 10	< 10
Chloroform		< 10	< 10	< 10	**0.6 J**	**0.5 J**
1,2-Dichloroethane		< 10	< 10	< 10	< 10	< 10
2-Butanone		< 10	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane		< 10	< 10	< 10	< 10	< 10
Carbon tetrachloride		< 10	< 10	< 10	< 10	< 10
Bromodichloromethane		< 10	< 10	< 10	< 10	< 10
1,2-Dichloropropane		< 10	< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene		R	R	R	< 10	< 10
Trichloroethene		< 10	< 10	< 10	< 10	< 10
Dibromochloromethane		< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		< 10	< 10	< 10	< 10	< 10
Benzene		< 10	< 10	< 10	< 10	< 10
trans-1,3-Dichloropropene		< 10	< 10	< 10	< 10	< 10
Bromoform		< 10	< 10	< 10	< 10	< 10
4-Methyl-2-pentanone		< 10	< 10	< 10	< 10	< 10
2-Hexanone		< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		< 10	< 10	< 10	< 10	< 10
1,1,2,2-Tetrachloroethane		< 10	< 10	< 10	< 10	< 10
Toluene		< 10	< 10	< 10	< 10	< 10
Chlorobenzene		< 10	< 10	< 10	< 10	< 10
Ethylbenzene		< 10	< 10	< 10	< 10	< 10
Styrene		< 10	< 10	< 10	< 10	< 10
Xylene (total)		< 10	< 10	< 10	< 10	< 10
Total VOCs		**2**	**7**	**2**	**2.6**	**2.5**

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
EQ Equipment
R Unusable data.
B Constituent detected in Associated Blank sample.

Table 14. Concentrations of Volatile Organic Compounds Detected in Blank Samples Collected During the Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	TRIP BLANK TB071000 7/10/00	TRIP BLANK TB071100 7/11/00	TRIP BLANK TB071200 7/12/00	TRIP BLANK TB071300 7/13/00	TRIP BLANK TB071400 7/14/00
Chloromethane		< 10	< 10	< 10	< 10	< 10
Bromomethane		< 10 J	< 10 J	< 10 J	< 10 J	< 10 J
Vinyl chloride		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Chloroethane		< 10	< 10	< 10	< 10	< 10
Methylene chloride		**2 JB**	**2 JB**	**2 JB**	**2 JB**	**2 JB**
Acetone		< 10	< 10	< 10 J	< 10 J	< 10 J
Carbon disulfide		< 10	< 10	< 10	< 10	< 10
1,1-Dichloroethene		< 10	< 10	< 10	< 10	< 10
1,1-Dichloroethane		< 10	< 10	< 10	< 10	< 10
1,2-Dichloroethene (total)		< 10	< 10	< 10	< 10	< 10
Chloroform		**0.6 J**	**0.6 J**	**0.5 J**	**0.6 J**	**0.5 J**
1,2-Dichloroethane		< 10	< 10	< 10	< 10	< 10
2-Butanone		< 10	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane		< 10	< 10	< 10	< 10	< 10
Carbon tetrachloride		< 10	< 10	< 10 J	< 10 J	< 10 J
Bromodichloromethane		< 10	< 10	< 10	< 10	< 10
1,2-Dichloropropane		< 10	< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene		< 10	< 10	< 10	< 10	< 10
Trichloroethene		< 10	**4 J**	< 10	< 10	< 10
Dibromochloromethane		< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		< 10	< 10	< 10	< 10	< 10
Benzene		< 10	< 10	< 10	< 10	< 10
trans-1,3-Dichloropropene		< 10	< 10	< 10	< 10	< 10
Bromoform		< 10	< 10	< 10	< 10	< 10
4-Methyl-2-pentanone		< 10	< 10	< 10	< 10	< 10
2-Hexanone		< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		< 10	< 10	< 10	< 10	< 10
1,1,2,2-Tetrachloroethane		< 10	R	R	R	R
Toluene		< 10	< 10	< 10	< 10	< 10
Chlorobenzene		< 10	< 10	< 10	< 10	< 10
Ethylbenzene		< 10	< 10	< 10	< 10	< 10
Styrene		< 10	< 10	< 10	< 10	< 10
Xylene (total)		< 10	< 10	< 10	< 10	< 10
Total VOCs		**2.6**	**6.6**	**2.5**	**2.6**	**2.5**

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
EQ Equipment
R Unusable data.
B Constituent detected in Associated Blank sample.

Table 14. Concentrations of Volatile Organic Compounds Detected in Blank Samples Collected During the Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE:	TRIP BLANK	WATER EQ. BLANK	WATER EQ. BLANK	WATER EQ. BLANK
	SAMPLE ID:	TB071700	FB062600	FB062700	FB062800
	DATE:	7/17/00	6/26/00	6/27/00	6/28/00
Chloromethane		< 10	< 10	< 10	< 10
Bromomethane		< 10 J	< 10	< 10	< 10
Vinyl chloride		< 0.3	< 0.3	< 0.3	< 0.3
Chloroethane		< 10	< 10	< 10	< 10 J
Methylene chloride		**2 JB**	**5 J**	**6 J**	< 10
Acetone		< 10 J	< 10 J	< 10 J	< 10
Carbon disulfide		< 10	< 10 J	< 10 J	< 10 J
1,1-Dichloroethene		< 10	< 10	< 10	< 10
1,1-Dichloroethane		< 10	< 10	< 10	< 10
1,2-Dichloroethene (total)		< 10	< 10	< 10	< 10
Chloroform		**0.8 J**	< 10	**0.8 J**	< 10
1,2-Dichloroethane		< 10	< 10	< 10	< 10
2-Butanone		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane		< 10	< 10	< 10	< 10
Carbon tetrachloride		< 10 J	< 10	< 10	< 10
Bromodichloromethane		< 10	< 10	< 10	< 10
1,2-Dichloropropane		< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene		< 10	R	R	R
Trichloroethene		< 10	< 10	< 10	< 10
Dibromochloromethane		< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		< 10	< 10	< 10	< 10
Benzene		< 10	< 10	< 10	< 10
trans-1,3-Dichloropropene		< 10	< 10	< 10	< 10
Bromoform		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone		< 10	< 10	< 10	< 10
2-Hexanone		< 10	< 10	< 10	< 10
Tetrachloroethene		< 10	< 10	< 10	< 10
1,1,2,2-Tetrachloroethane		R	< 10	< 10	< 10
Toluene		< 10	< 10	< 10	< 10
Chlorobenzene		< 10	< 10	< 10	< 10
Ethylbenzene		< 10	< 10	< 10	< 10
Styrene		< 10	< 10	< 10	< 10
Xylene (total)		< 10	< 10	< 10	< 10
Total VOCs		**2.8**	**5**	**6.8**	**0**

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
EQ	Equipment
R	Unusable data.
B	Constituent detected in Associated Blank sample.

Table 14. Concentrations of Volatile Organic Compounds Detected in Blank Samples Collected During the Second Quarter 2000 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	WATER EQ. BLANK FB070500 7/5/00		WATER EQ. BLANK FB070600 7/6/00		WATER EQ. BLANK FB-B 7/6/00	
Chloromethane		< 10		< 10		< 10	
Bromomethane		< 10		< 10		< 10	
Vinyl chloride		< 0.3		< 0.3		< 0.3	
Chloroethane		< 10		< 10		< 10	
Methylene chloride		1	JB	1	JB	**1**	**JB**
Acetone		< 10		< 10		< 10	
Carbon disulfide		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10	
Chloroform		0.9	J	0.9	J	**0.7**	**J**
1,2-Dichloroethane		< 10		< 10		< 10	
2-Butanone		< 10		< 10		< 10	
1,1,1-Trichloroethane		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10	
Trichloroethene		< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10	
Tetrachloroethene		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10	
Total VOCs		**1.9**		**1.9**		**1.7**	

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
EQ	Equipment
R	Unusable data.
B	Constituent detected in Associated Blank sample.

ARCADIS GERAGHTY & MILLER

Table 15. Total Cadmium and Chromium Detected in Groundwater Samples Collected During Last Two Quarters 1999 and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

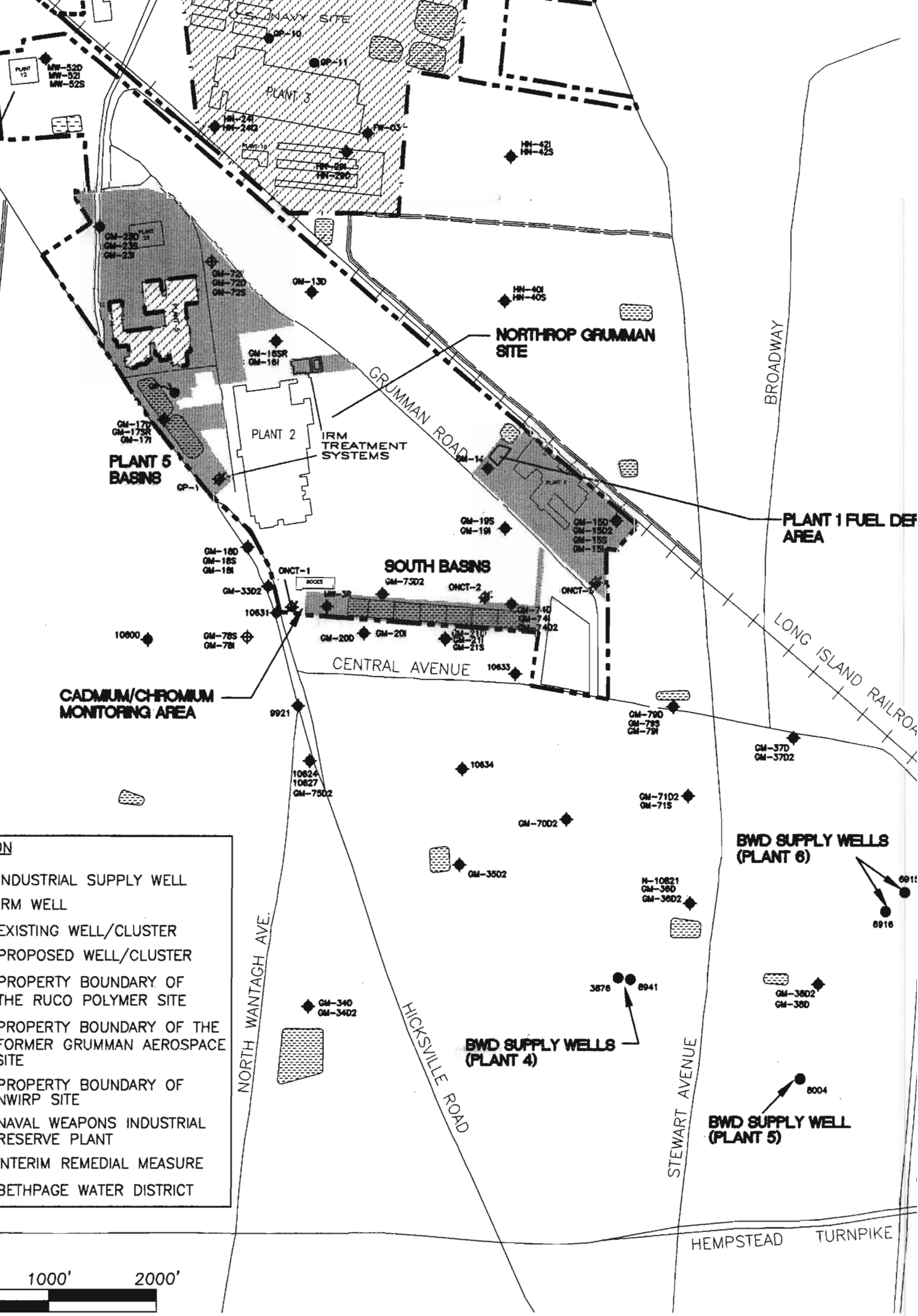
CONSTITUENT: (Units in ug/L)	NYSDEC SCGs [1]	SITE: / SAMPLE ID: / DATE:	10631 10631 9/13/99	10631 MW-10631 12/1/99	10631 N-10631 3/13/00	10631 N-10631 6/27/00	GM-16S GM-16S 3/15/00	GM-16SR MW-16SR 6/27/00
Cadmium	5		<5	**2.2 B**	**2.6**	**1.5 B**	**0.7**	<0.2
Chromium	50		**17.1**	**50.1**	**38**	**27.1**	**4.6**	<0.83

(1)	Standards, Criteria, and Guidance Values.
ug/L	Micrograms per liter.
B	Detected between the IDL and CRDL.
IDL	Instrument detection limit.
CRDL	Contract required detection limit.
NYSDEC	New York State Department of Environmental Conservation.
EQ	Equipment Blanks.
	Value exceeds associated SCG value.
*	Replicate sample.

Table 15. Total Cadmium and Chromium Detected in Groundwater Samples Collected During Last Two Quarters 1999 and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC SCGs (1)	SITE: / SAMPLE ID: / DATE:	MW-03R MW-3R 9/13/99	MW-03R MW-3R 12/1/99	MW-03R MW-3R 3/13/00	MW-03R MW-3R 6/27/00	MW-03R* REP-1 6/27/00	EQ.BLANK FB062700 6/27/00
Cadmium	5		**27.6**	**26.9**	**28**	**28.9**	**29.2**	<0.2
Chromium	50		**64.6**	**67.9**	**81**	**75.8**	**75**	**1 B**

(1)	Standards, Criteria, and Guidance Values.
ug/L	Micrograms per liter.
B	Detected between the IDL and CRDL.
IDL	Instrument detection limit.
CRDL	Contract required detection limit.
NYSDEC	New York State Department of Environmental Conservation.
EQ	Equipment Blank.
	Value exceeds associated SCG value.
*	Replicate sample.



ON

- INDUSTRIAL SUPPLY WELL
- IRM WELL
- EXISTING WELL/CLUSTER
- PROPOSED WELL/CLUSTER
- PROPERTY BOUNDARY OF THE RUCO POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF NWIRP SITE
- NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- INTERIM REMEDIAL MEASURE
- BETHPAGE WATER DISTRICT

ALE: 1" = 1000'

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NORTHROP GRUMMAN CORPORATION

BETHPAGE, NEW YORK

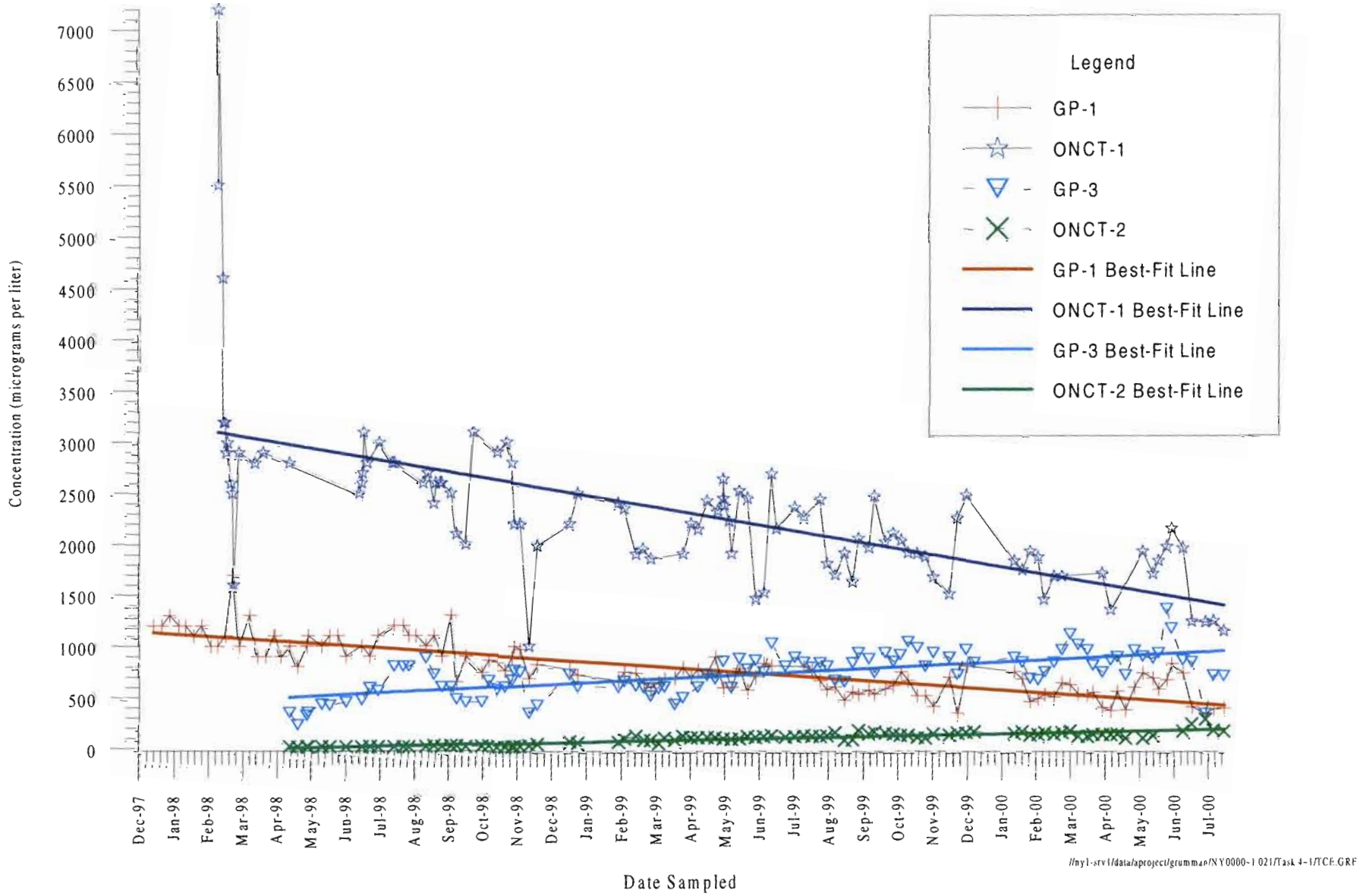
SITE PLAN AND IRM AND WELL LOCATIONS

DRAWN	DATE	PROJECT MANAGER
A.G.	2/27/01	CSG

LEAD DESIGN PROF.

PROJECT NUMBER

NY008.0210



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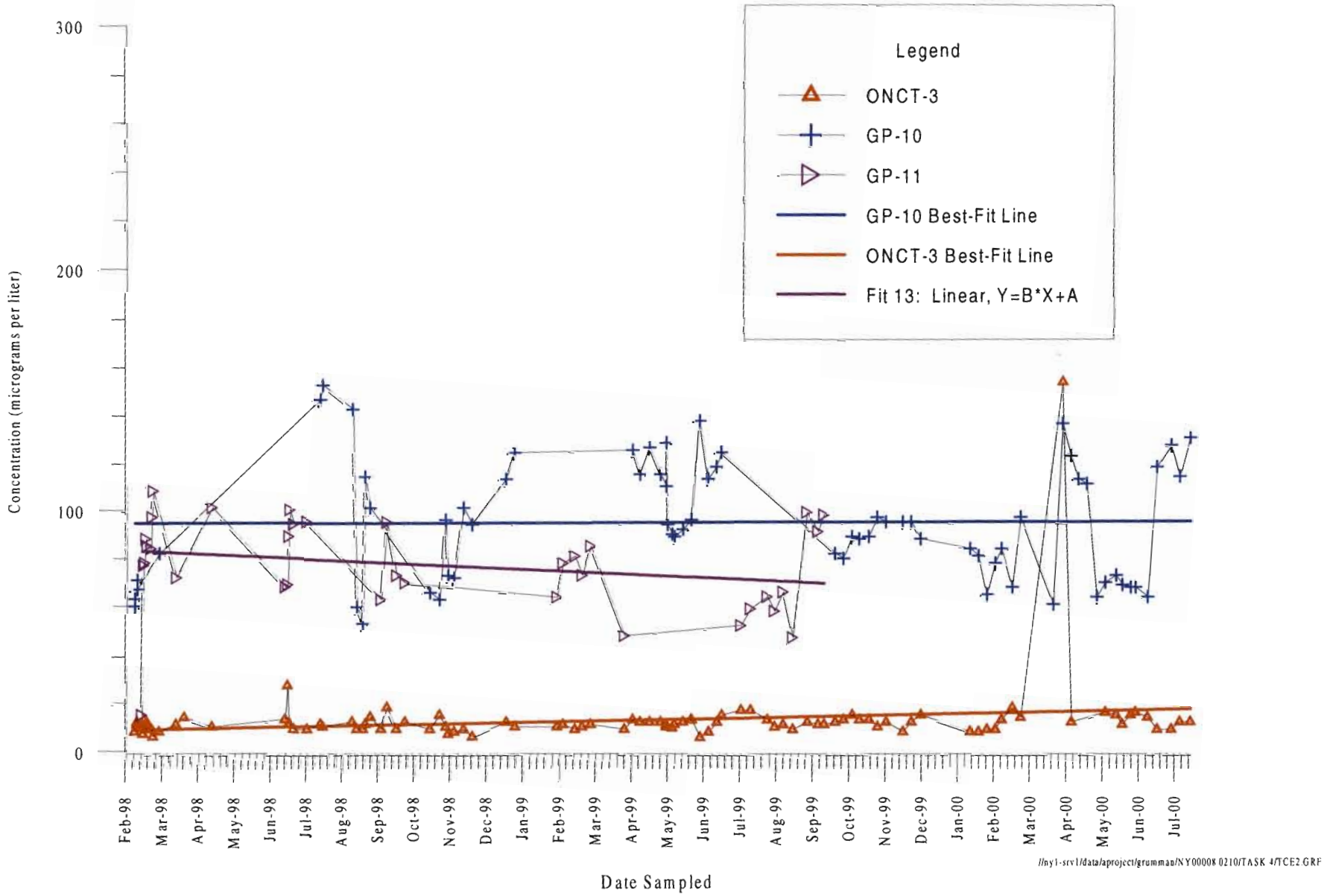
Trichloroethene Concentrations
In IRM Wells GP-1, ONCT-1, and ONCT-2 and Supply Well GP-3
Northrop Grumman Corporation, Bethpage, New York

FIGURE
2



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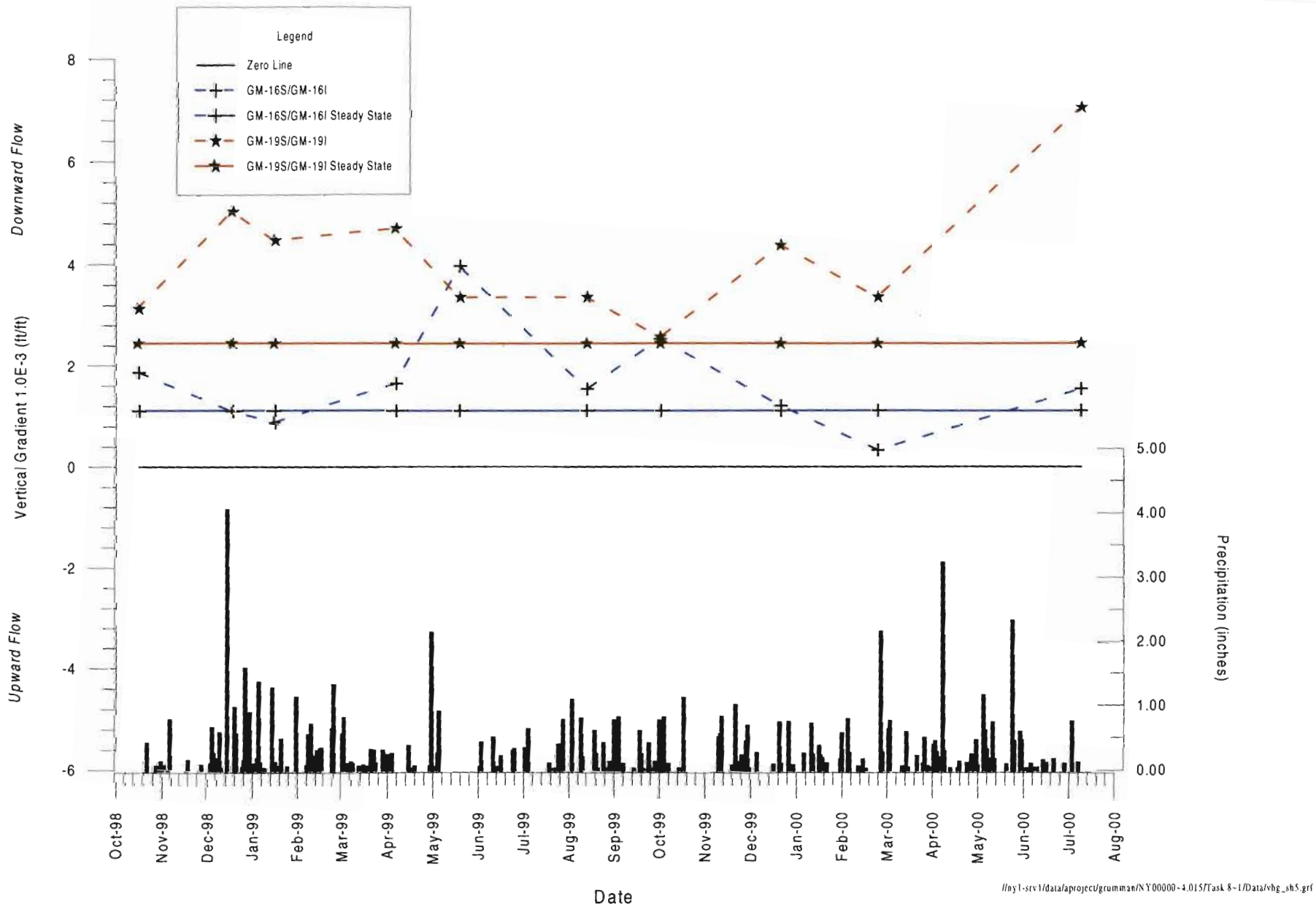
Trichloroethene Concentrations in Groundwater IRM Well ONCT-3 and Supply Wells GP-10 and GP-11 Northrop Grumman Corporation, Bethpage, New York

FIGURE 3



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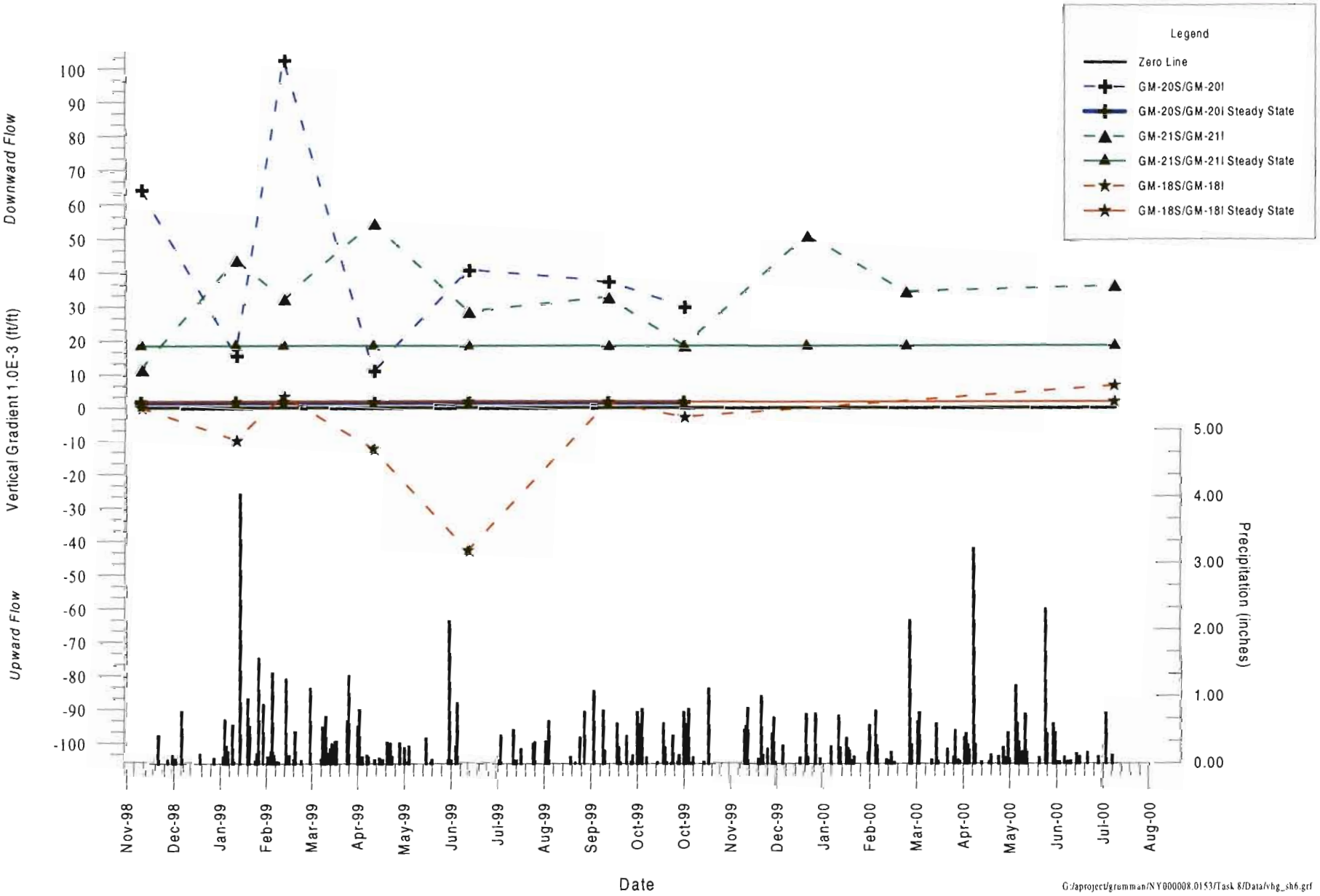
Comparsion of Vertical Gradients in Shallow/Intermediate Well Clusters to Model-Predicted Steady State Gradients and Precipitation Data through the Second Quarter 2000
Groundwater IRM
Northrop Grumman Corporation
Bethpage, New York

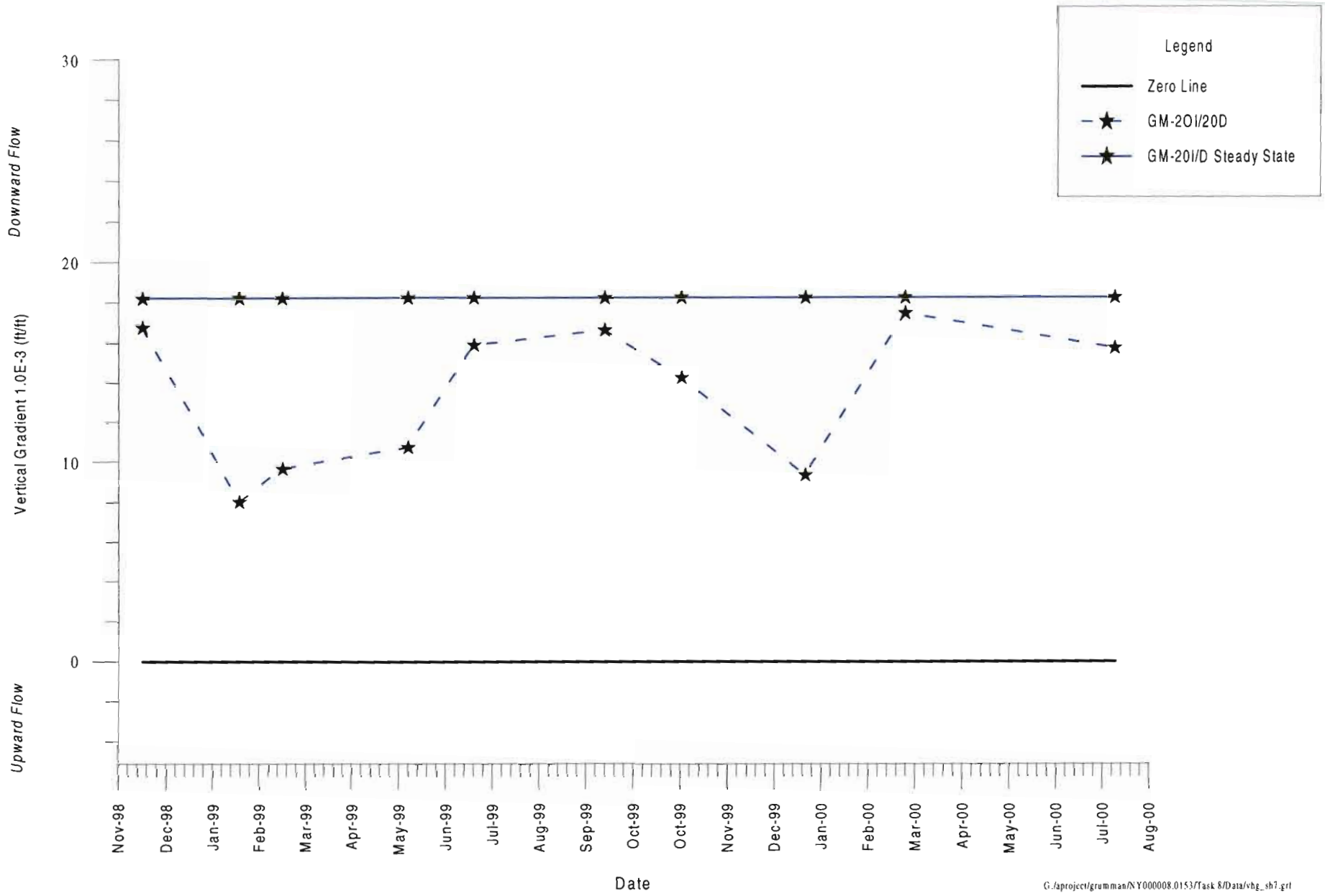
FIGURE 4



ARCADIS GERAGHTY & MILLER

Comparsion of Vertical Gradients in Shallow/Intermediate Well Clusters to Model-Predicted Steady State Gradients and Precipitation Data through the Second Quarter 2000
Groundwater IRM
Northrop Grumman Corporation
Bethpage, New York

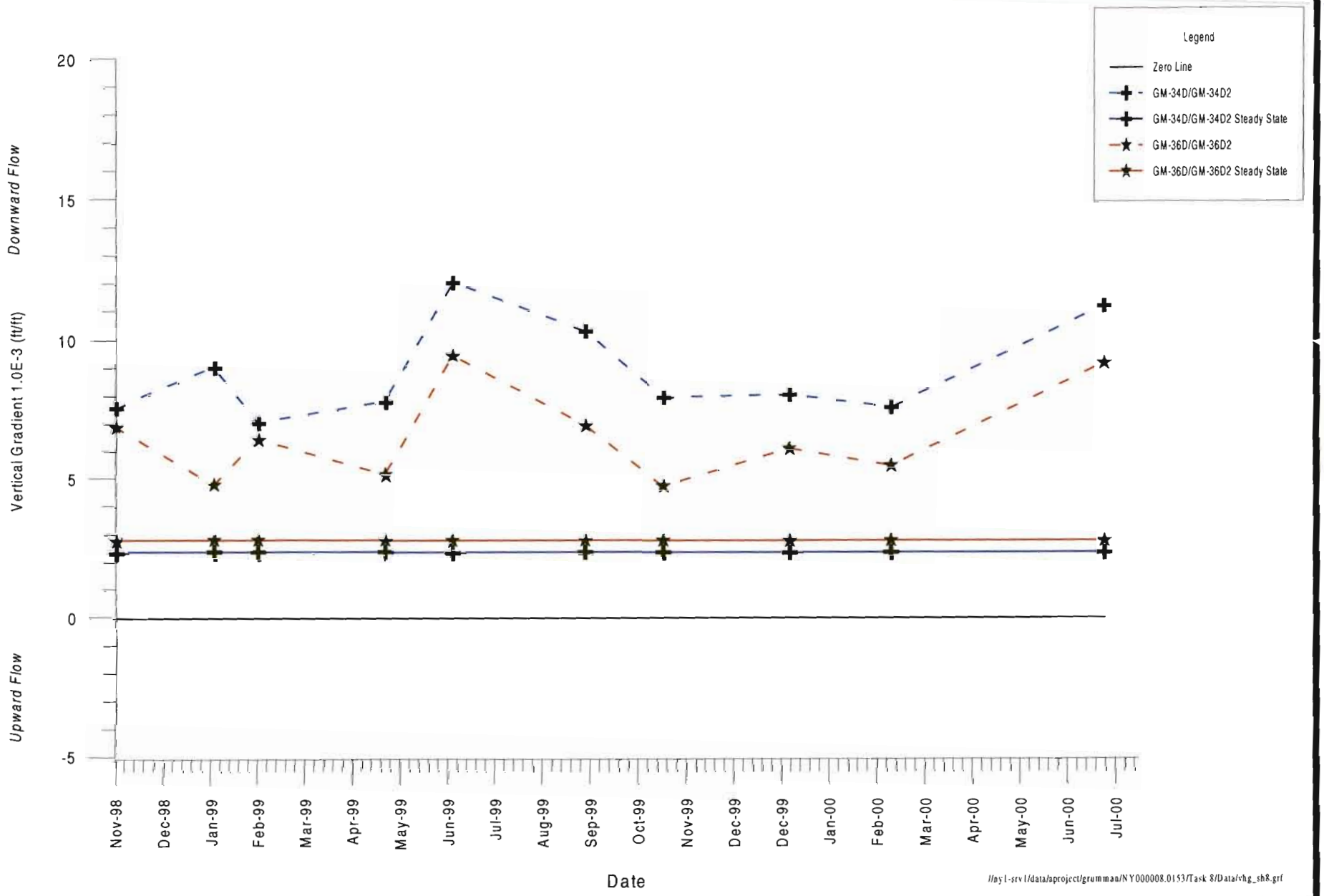
FIGURE 5



ARCADIS GERAGHTY&MILLER

Comparsion of Vertical Gradients in Intermediate/Deep Well Clusters to the Model-Predicted Steady State Gradient through the Second Quarter 2000
Groundwater IRM
Northrop Grumman Corporation
Bethpage, New York

FIGURE 6



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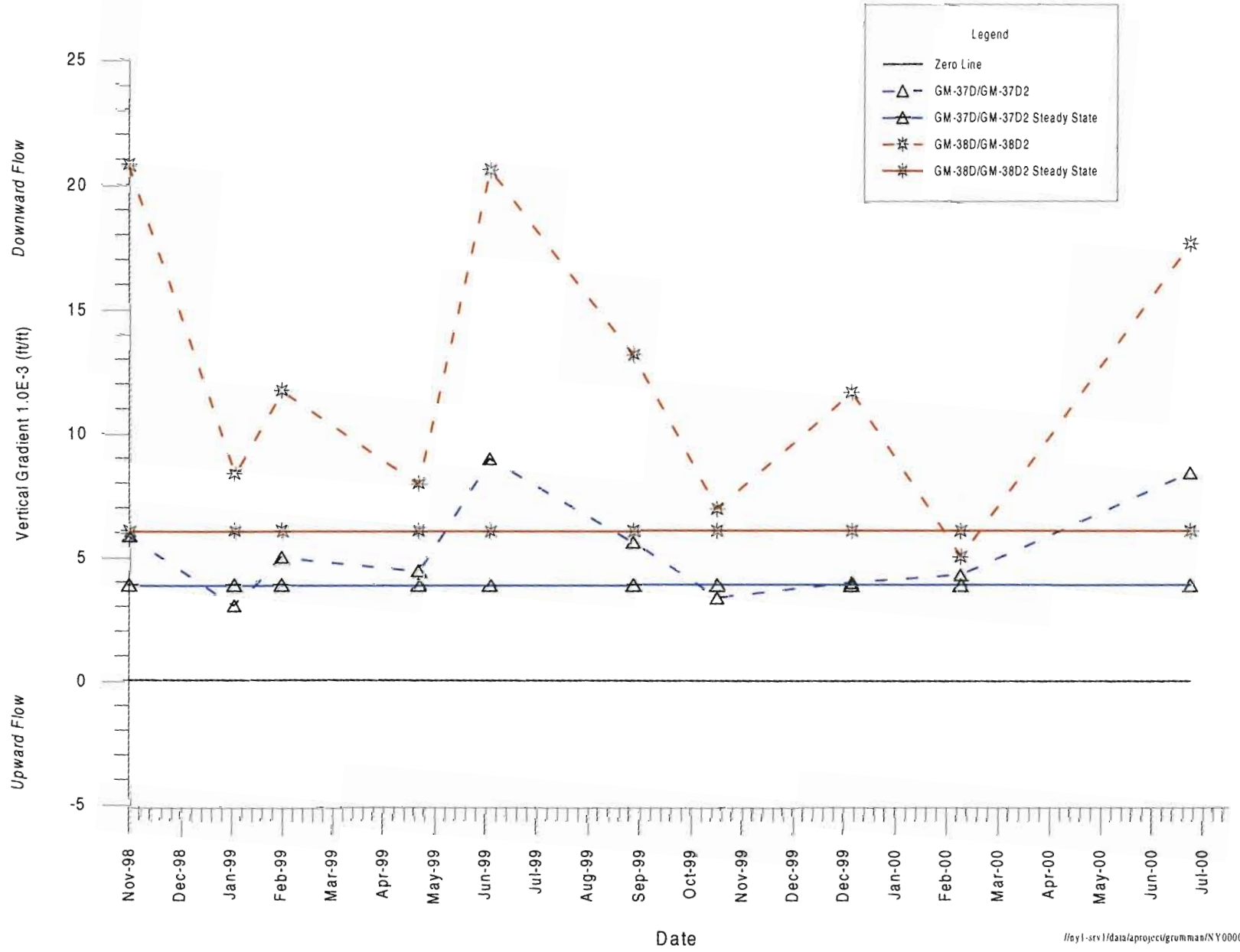
Comparsion of Vertical Gradients in Deep/Deep2 Well Clusters to Model-Predicted Steady State Gradients through the Second Quarter 2000
Groundwater IRM
Northrop Grumman Corporation
Bethpage, New York

FIGURE
7



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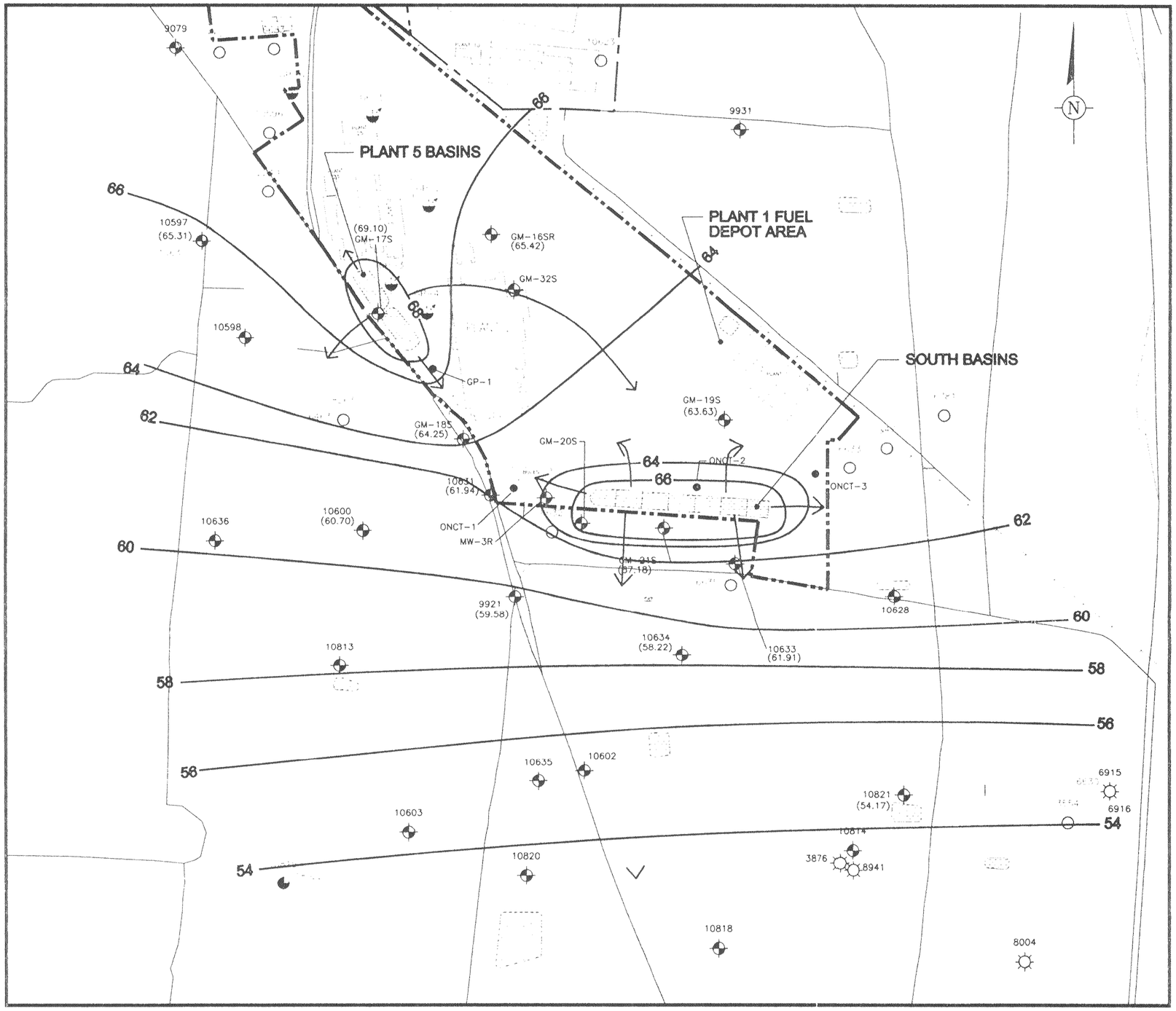
Comparsion of Vertical Gradients in Deep/Deep2 Well Clusters to Model-Predicted Steady State Gradients through the Second Quarter 2000
Groundwater IRM
Northrop Grumman Corporation
Bethpage, New York

FIGURE
8



EXPLANATION

- PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION
- PROPERTY BOUNDARY OF THE U.S. NAVY SITE
- RECHARGE BASIN
- GM-19S (63.63) — 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)
- LOCATION AND DESIGNATION OF ADDITIONAL WELL
- LOCATION AND DESIGNATION OF GRUMMAN PRODUCTION WELL (SHOWN FOR REFERENCE ONLY)
- ONCT-1 — LOCATION AND DESIGNATION OF ON-SITE IRM EXTRACTION 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)
- IRM — INTERIM REMEDIAL MEASURE

NOTES:

1. WELL INVENTORY REVISED BETWEEN AUGUST 4 AND AUGUST 23, 1995; WELL DATA OBTAINED FROM UNITED STATES GEOLOGICAL SURVEY, NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS, NASSAU COUNTY DEPARTMENT OF HEALTH, AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
2. IRM WELLS ONCT-1, ONCT-2, ONCT-3, AND GP-1 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.

0 800 FT

G:\APROJECT\GRUMMAN\CAD\GRUMMAN\SHALLOW_7_00.DWG

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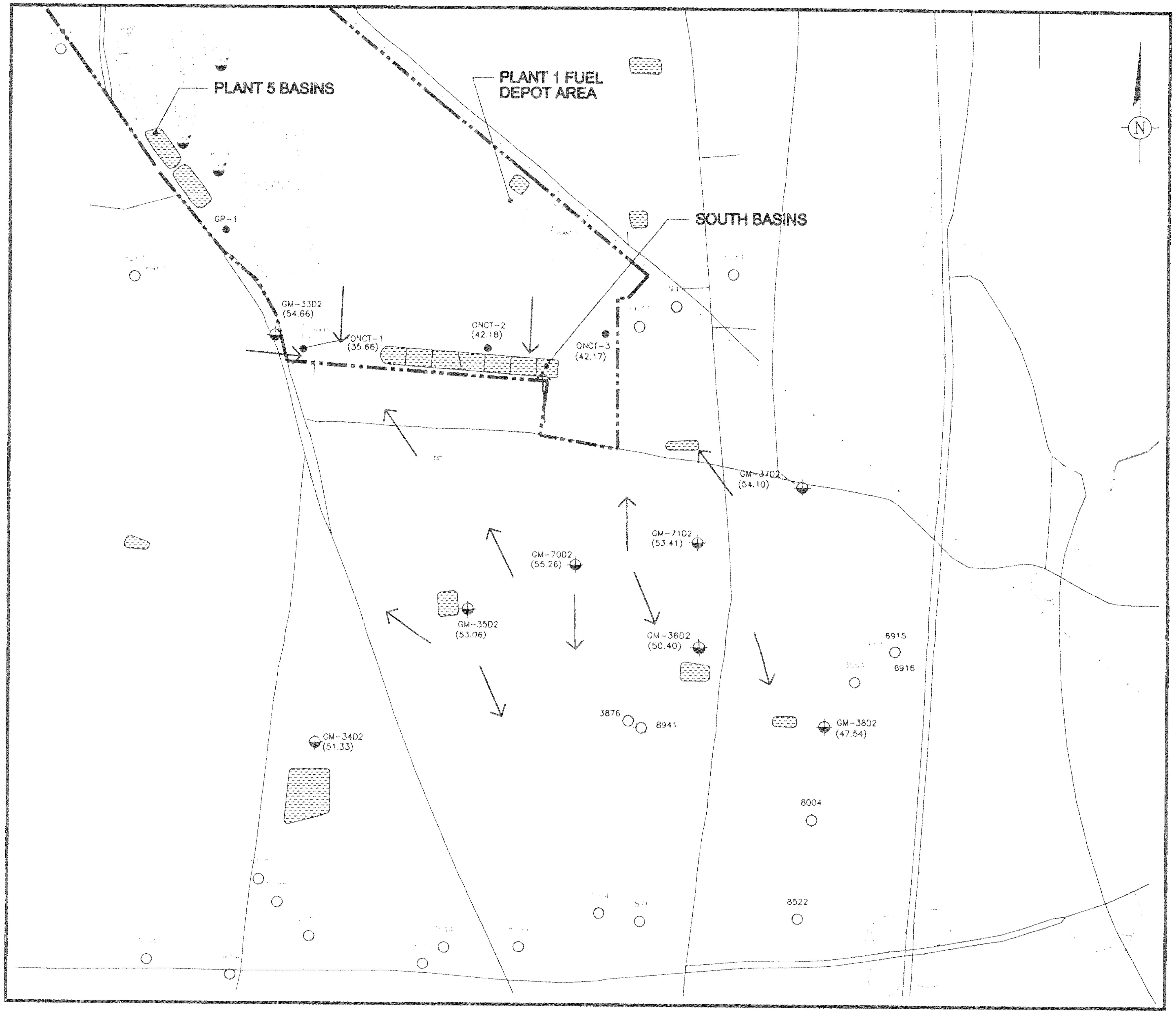
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

WATER-TABLE CONFIGURATION AND GROUNDWATER FLOW DIRECTIONS IN THE SHALLOW ZONE JULY 21, 2000

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
AG	10/31/00	CSG	MW
		LEAD DESIGN PROF.	CHECKED
			DES
		PROJECT NUMBER	DRAWING NUMBER
		NY0008.210	9



0 800 FT

EXPLANATION

PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION

RECHARGE BASIN

GM-36D2 (50.40) LOCATION AND DESIGNATION OF D2 (VERY DEEP) MONITORING WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL.

LOCATION AND DESIGNATION OF BETHPAGE WATER DISTRICT PUBLIC SUPPLY WELL

LOCATION AND DESIGNATION OF ADDITIONAL WELL

LOCATION AND DESIGNATION OF GRUMMAN PRODUCTION WELL

ONCT-3 (42.17) LOCATION AND DESIGNATION OF ON-SITE IRM EXTRACTION WELL AND WATER LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL

HORIZONTAL COMPONENT OF GROUNDWATER FLOW (DETERMINED FROM TRIANGULATION)

IRM INTERIM REMEDIAL MEASURE

NOTES:

1. WELL INVENTORY REVISED BETWEEN AUGUST 4 AND AUGUST 23, 1995; WELL DATA OBTAINED FROM UNITED STATES GEOLOGICAL SURVEY, NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS, NASSAU COUNTY DEPARTMENT OF HEALTH, AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
2. IRM WELLS ONCT-1, ONCT-2, ONCT-3, AND GP-1 ARE SCREENED IN THE D2 ZONE AND WERE PUMPING AT 1,004 GPM, 605 GPM, AND 721 GPM, RESPECTIVELY AT THE TIME OF MEASUREMENT. A WATER LEVEL AND PUMPING RATE MEASUREMENT COULD NOT BE MADE FROM WELL GP-1.
3. BWD WELL 3876 IS SCREENED IN THE DEEP ZONE.
4. BWD WELLS 6915, 6916, 8004, AND 8941 ARE SCREENED IN THE D2 ZONE.

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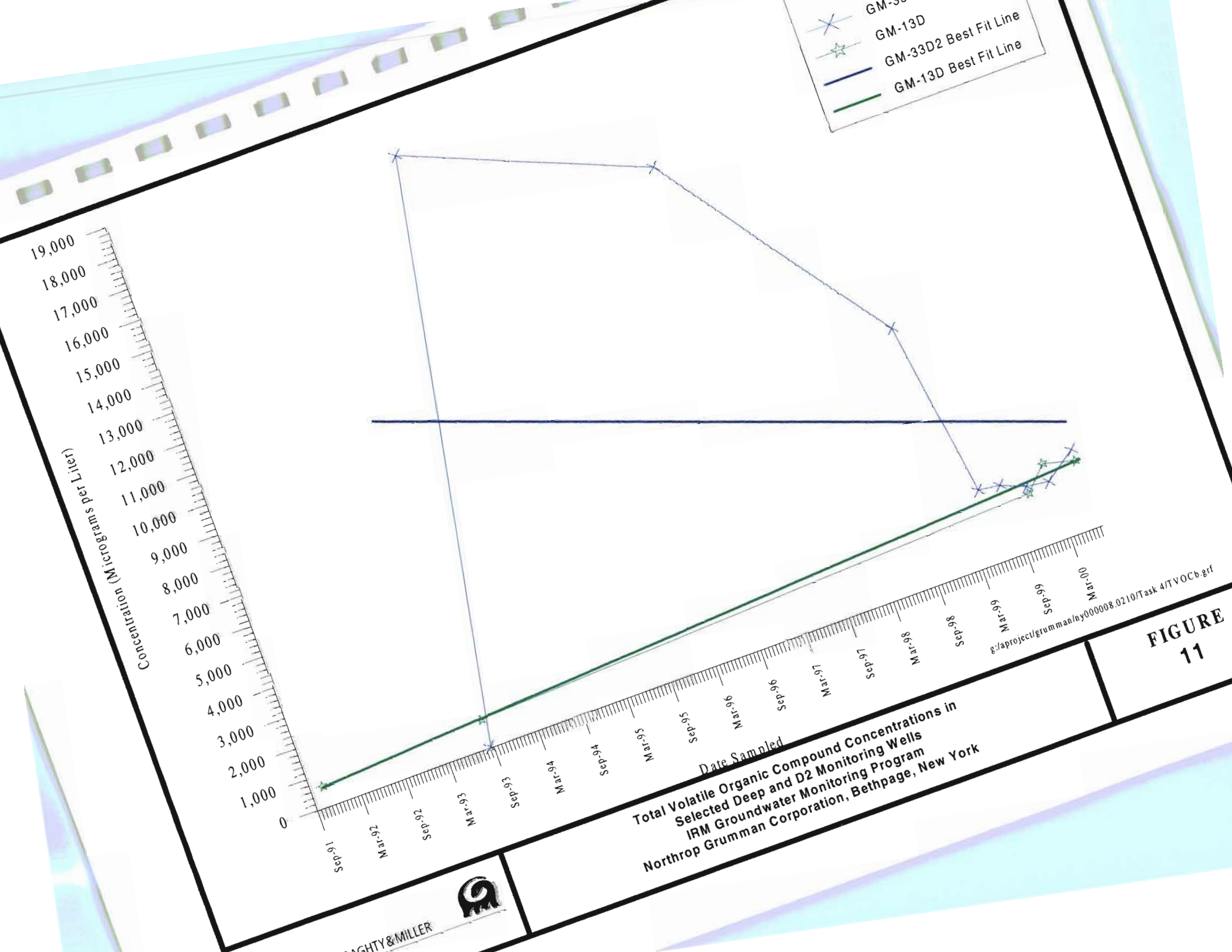
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

WATER-LEVEL ELEVATIONS AND GROUNDWATER FLOW DIRECTIONS IN THE D2 ZONE
JULY 21, 2000

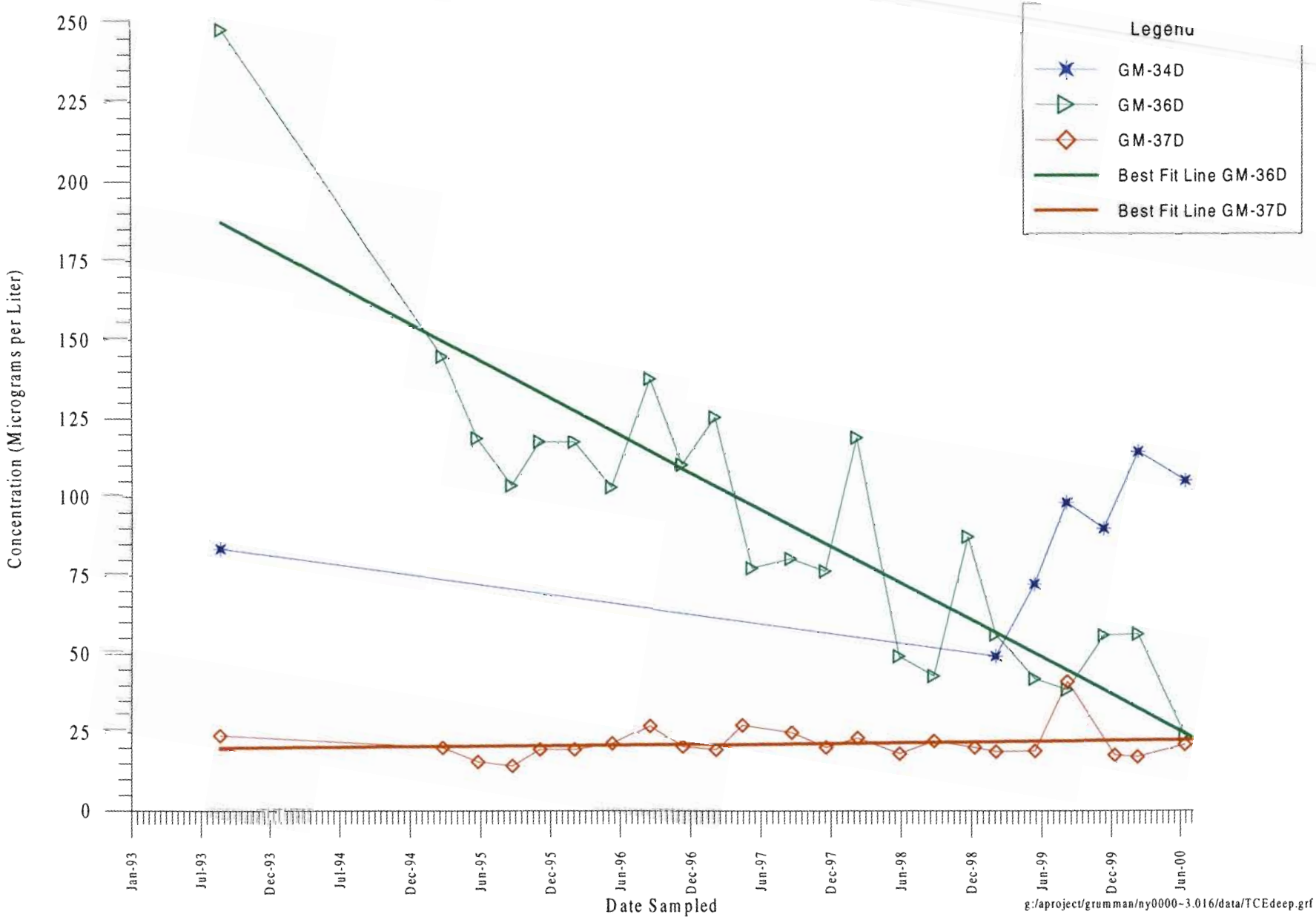
DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
AG	10/31/00	CGS	MW
		LEAD DESIGN PROF.	CHECKED
			DES
		PROJECT NUMBER	DRAWING NUMBER
		NY0008.210	10



Total Volatile Organic Compound Concentrations in
Selected Deep and D2 Monitoring Wells
IRM Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

FIGURE
11

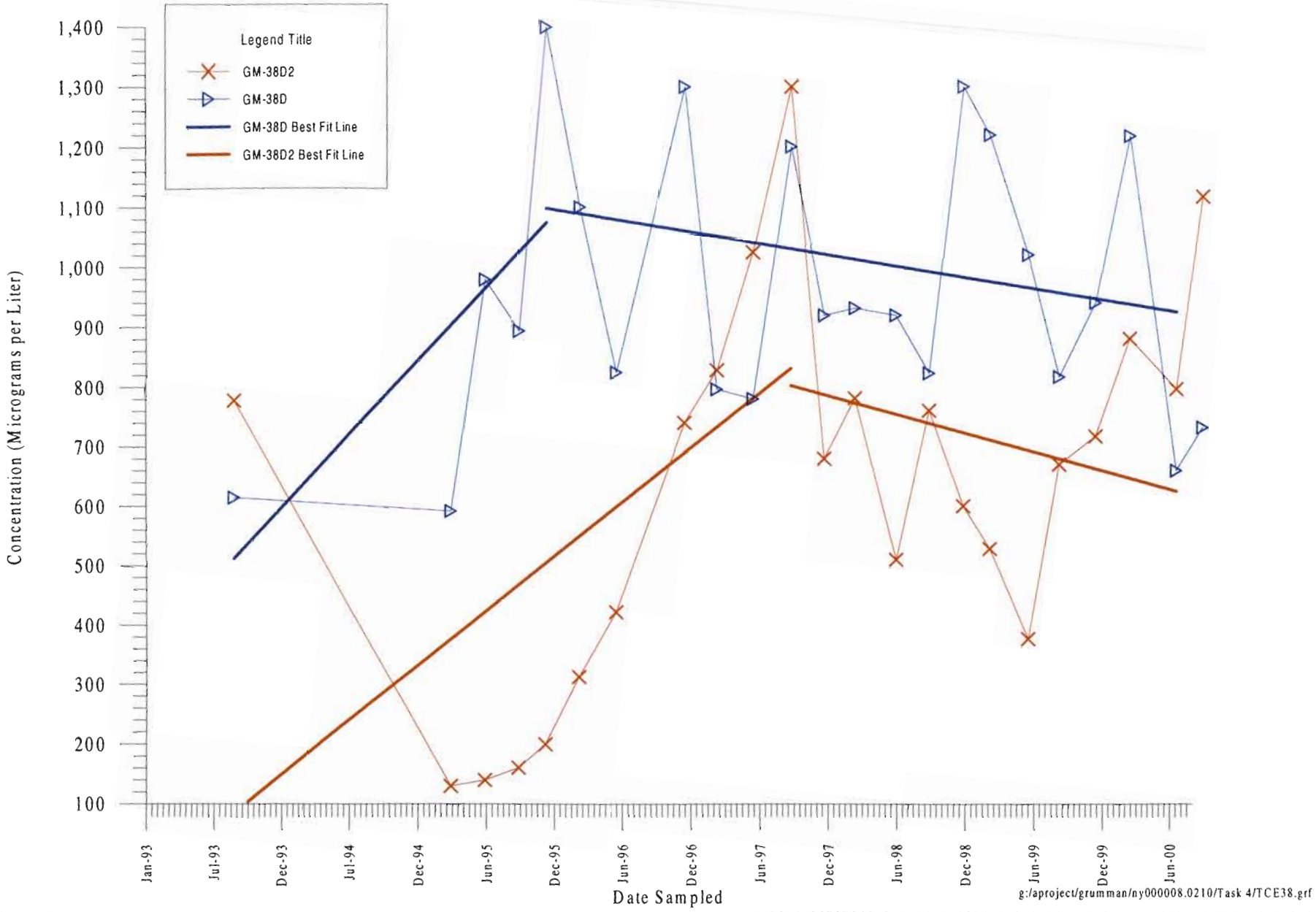
AGHTY&MILLER



ARCADIS GERAGHTY & MILLER

Total Volatile Organic Compound Concentrations in Selected Deep Monitoring Wells
IRM Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

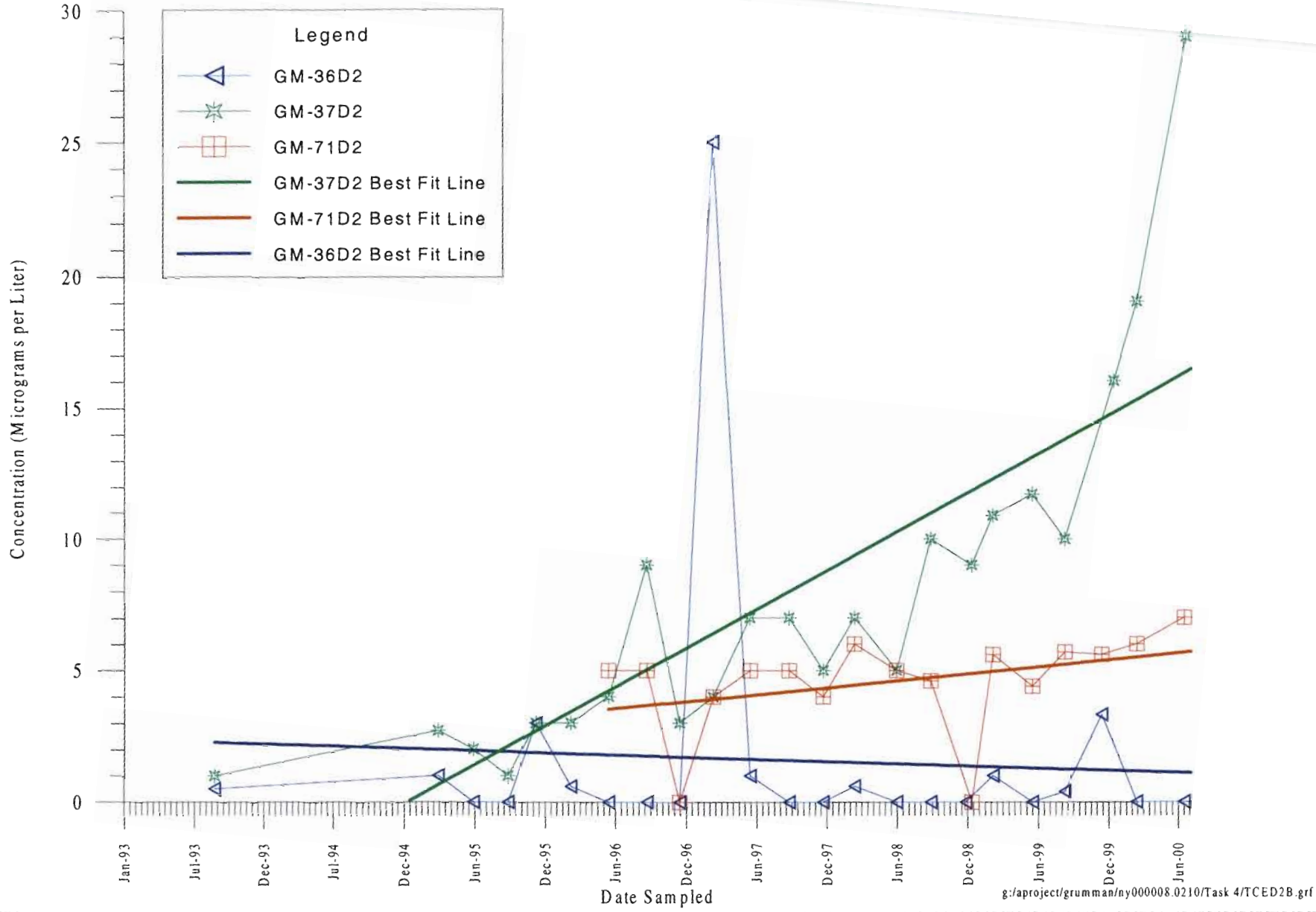
FIGURE
12



ARCADIS GERAGHTY&MILLER

Total Volatile Organic Compound Concentrations in Selected Deep and D2 Monitoring Wells
IRM Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

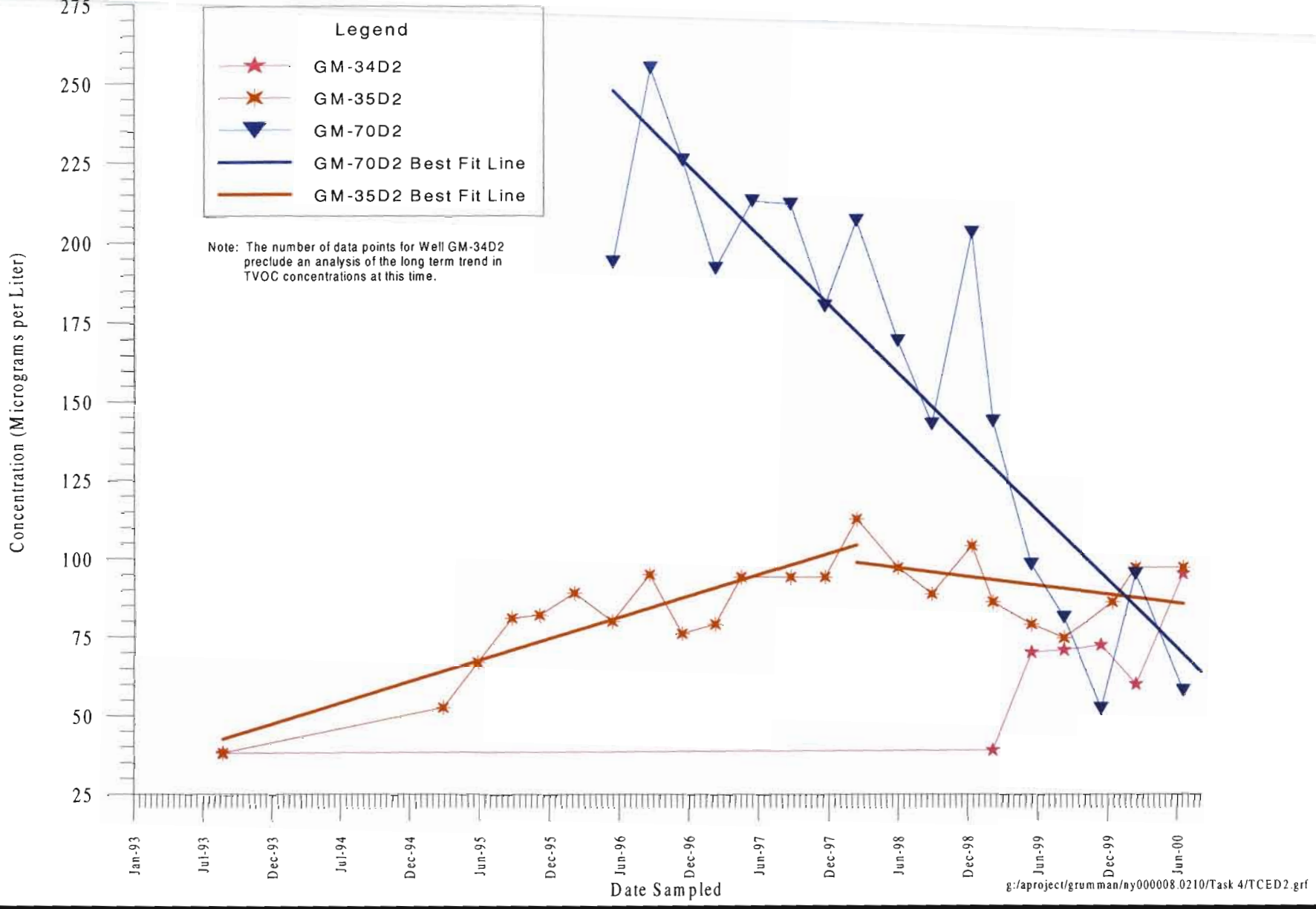
FIGURE 13



ARCADIS GERAGHTY & MILLER

Total Volatile Organic Compound Concentrations in Selected D2 Monitoring Wells
IRM Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

FIGURE
14



ARCADIS GERAGHTY & MILLER

Total Volatile Organic Compound Concentrations in Selected D2 Monitoring Wells
IRM Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

FIGURE
15

Appendix A

Water-Level Measurement Logs

ARCADIS GERAGHTY & MILLER

Water Level/Pumping Test Record

Project NY00000 80210 T2 Well _____ Site _____

Screen Setting _____ Measuring Point Description _____ Height Above Ground Surface _____

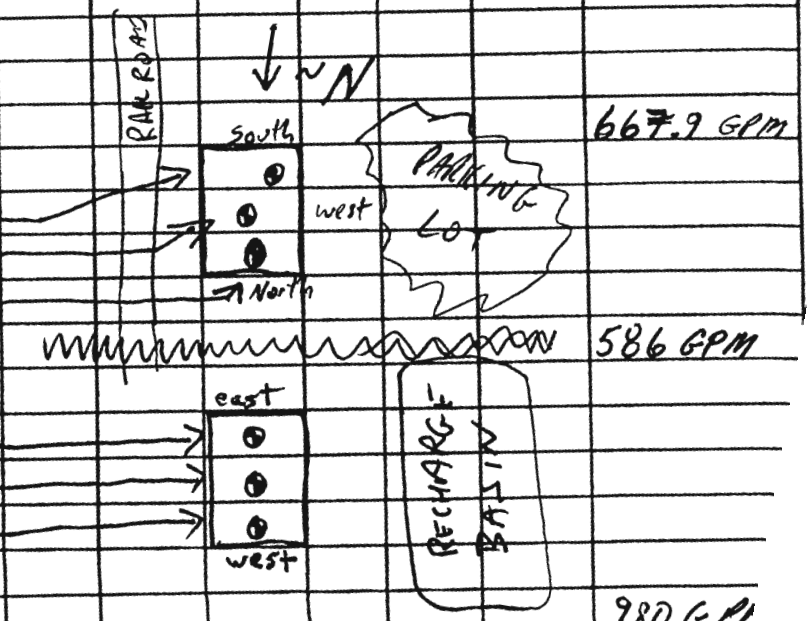
Static Water Level _____ Measured With _____ Date/Time _____

Drawdown ☐ Start of Test _____ Pumping Well _____

Recovery ☐ End of Test _____

Distance From Well Measured To Pumping Well® _____ Discharge Rate _____ Orifice MPE/GW

Date & Time	Well Or t (mins)	Held (ft)	Wet (ft)	Depth to Water (ft)	s (ft)	Dew. 1) Corr. (ft)	Art. 2) s' (ft)		Q (gpm)	Mano-meter (in)	Remarks 3)
7/21/00	10633			41.89'							
	21S			38.63'							
	21I			41.07'							
	20D			41.63'							
	20[illegible]			39.69'							
	10631			41.53'							
	33D2			52.19'							
	18S			43.35'							
	18I			45.00'							
	16I			50.50'							
	16SR			50.35'							
	16S			50.32'							
	19S			46.86'							
	19I			46.23'							
	ONCT 3			66.53'							667.9 GPM
	15I	existing		47.51'							
	15-S			47.70'							
	15-D2			52.68'							
	15-D[illegible]			49.96'							
	ONCT-2			67.82'							586 GPM
	73D2			47.83'							
?	74-I			42.07'							
?	74-D			48.05'							
?	74-D2			54.39'							
	MW-3R			38.04'							
	ONCT-1			68.44'							980 GPM



1) Dewatering Correction 2) Equivalent Artesian Drawdown 3) pH, Spec. Cond., Temp., Weather, Sand, Turbidity, etc.

ARCADIS GERAGHTY & MILLER

Water Level/Pumping Test Record

Project NY0000080210 T2 Well ______ Site ______

Screen Setting ______ Measuring Point Description ______ Height Above Ground Surface ______

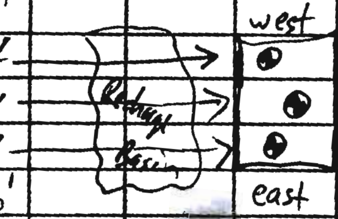
Static Water Level ______ Measured With ______ Date/Time ______

Drawdown ☐ Start of Test ______ Pumping Well ______

Recovery ☐ End of Test ______

Distance From Well Measured To Pumping Well® ______ Discharge Rate ______ Orifice MPE/GW

Date & Time	Well Or t (mins)	Held (ft)	Wet (ft)	Depth to Water (ft)	s (ft)	Dew. 1) Corr. (ft)	Art. 2) s' (ft)		Q (gpm)	Mano-meter (in)	Remarks 3)
7/21/00	9921			34.65'							
	34D			17.61'							
	34D2			19.86'							
	10627			35.36'							
	35D2			43.22'							
	13D			49.39'							
	10597			44.54							
	10600			41.71'							
	10634			42.98'							
	7102			45.04'							
	70D2			44.32'							
	[illegible]	10821		37.41'							
	36D			38.25'							
	36D2			41.20'							
	37D			42.08							
	37D2			43.07							
	38D2			44.02'							
	38D			41.48'			west				
7.	17-D			52.07							
7.	17-I			47.03'							
7.	17-S			46.84'							
	17S - original well			46.56'			east				



1) Dewatering Correction 2) Equivalent Artesian Drawdown 3) pH, Spec. Cond., Temp., Weather, Sand, Turbidity, etc.

Appendix B

Groundwater Sampling
Methodology

Methodology

This section generally describes the methodologies used by field personnel to collect hydraulic and groundwater quality data, as well as the Quality Control/Quality Assurance (QA/QC) sampling and data validation methods used. Detailed descriptions of field measurement and sampling methods are provided in the 1999 annual groundwater monitoring report (ARCADIS Geraghty & Miller, Inc. 2000). Deviations from established methods are provided in Section 2.3 (Modifications to the Field Program).

B.1 Groundwater-Level Measurement Methodology

To evaluate whether hydraulic control (containment) of the on-site portion of the TVOC plume has been maintained by the groundwater IRM, water-level measurements were collected using methods consistent with prior rounds of hydraulic measurements (ARCADIS Geraghty & Miller 2000). Water-level measurement logs for the second quarter 2000 are provided in Appendix C.

B.2 Groundwater Sampling Methodology

Sampling methods used to collect groundwater quality samples are summarized below. Consistent with NYSDEC-approved procedures used during the Northrop Grumman Remedial Investigation (RI) and prior rounds of groundwater monitoring (ARCADIS Geraghty & Miller 2000), monitoring wells equipped with dedicated equipment were purged and sampled using the existing dedicated bladder pump. Intermediate, deep, and D2 monitoring wells were purged using the bladder pumps in conjunction with the dedicated inflatable packers. For all wells described above, three volumes below the packer were evacuated prior to sampling. Shallow monitoring wells that were equipped with dedicated bladder pumps did not have packers installed, therefore the three standing well volumes calculated were based on the full well depth below the static water level and were evacuated prior to sampling. Field parameters (pH, specific conductance, and temperature) are measured after each well volume evacuated and show stabilization after three well volumes. Field parameter readings, well evacuation methods, and sample collection methods are provided in Appendix C.

Consistent with prior rounds of groundwater monitoring (ARCADIS Geraghty & Miller 2000), monitoring wells not equipped with dedicated equipment were purged using either a variable speed, 2-inch diameter submersible pump or a temporary bladder pump. Shallow wells were purged using a submersible pump

following the three standing well volumes and field parameter stabilization technique discussed above. Intermediate, deep, and D2 monitoring wells were purged using temporary bladder pumps following United States Environmental Protection Agency (USEPA) Micropurge/low-flow protocols (USEPA 1998). In addition to the three field parameters mentioned above, dissolved oxygen and oxidation-reduction potential were also measured dusing the low-flow sampling. Field parameter readings, well evacuation methods, and sample collection methods are provided in Appendix B.

After collection, all samples were placed on ice and shipped overnight following chain of custody protocols to Severn Trent Laboratories in Shelton, Connecticut for analysis. Groundwater samples submitted for analysis of VOCs were analyzed for the Target Compound List (TCL) VOCs using NYSDEC Analytical Services Protocol (ASP) Method 95-1. Groundwater samples submitted for analysis of Cd/Cr were analyzed using modified USEPA SW-846 ICAP Methods 3010/6010. Chain-of-custody records are provided in Appendix C.

B.3 Quality Assurance/Quality Control Measures

Field QA/QC measures are briefly discussed below. A complete description of field QA/QC measures is provided in the 1999 annual report (ARCADIS Geraghty & Miller, Inc. 2000).

B.3.1 Field Protocols

As part of field QA/QC protocols, non-dedicated sampling equipment (bladder pump and submersible pump) was decontaminated between wells using methods consistent with prior rounds. To demonstrate adequate decontamination and sample handling protocols, the appropriate QC samples (field and trip blanks) were prepared consistent with prior rounds (ARCADIS Geraghty & Miller 2000). Blind replicate samples, labeled REP-1 and REP-2, were collected from Monitoring Wells N-10627 and GM-38D2, respectively. Matrix spike/matrix spike duplicate (MS/MSD) samples were collected from Monitoring Wells N-10627 and GM-38D. The filled sample bottles were placed in ice-filled insulated coolers and shipped under chain-of-custody protocols overnight for laboratory analysis. Groundwater sampling logs and chain-of-custody records are provided in Appendices C and D, respectively.

B.3.2 Data Validation

Data validation was performed by ARCADIS Geraghty & Miller, Inc. by following the contract laboratory program national functional guidelines for organic data review set forth in the October 1999 guidance document (USEPA 1999). Inorganic data was validated using the February 1994 guidance document (USEPA 1994).

Appendix C

Groundwater Sampling Logs

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project NORTHROP-GRUMMAN Project No. NY000008712.0005 Page 1 of ____

Site Location BETHPAGE NY Date 7-10-00

Site/Well No. BR-MW-101 (FW-01) Replicate No. ____ Code No. ____

Weather ____ Sampling Time: Begin ____ End ____

Evacuation Data		Field Parameters	I	1J	2J	3J
Measuring Point	____	Color				
MP Elevation (ft)	____	Odor				
Land Surface Elevation (ft)	____	Appearance				
Sounded Well Depth (ft bmp)	67.01	pH (s.u.)	[illegible]	7.12	7.33	7.35
Depth to Water (ft bmp)	60.[illegible]345	Conductivity (mS/cm)		195	246	.25
Water-Level Elevation (ft)	____	(µmhos/cm)				
Water Column in Well (ft)	____	Turbidity (NTU)				
Casing Diameter/Type	____	Temperature (°C)	17.[illegible]	17.0	16.[illegible]	15.[illegible]
Gallons in Well	____	Dissolved Oxygen (mg/L)	____			
Gallons Pumped/Bailed Prior to Sampling	____	Salinity (%)	____			
Sample Pump Intake Setting (ft bmp)	____	Sampling Method	____			
Purge Time	begin ____ end ____	Remarks	SPLIT SAMPLE WITH FOSTER WHEELER, WELL PAD BAILED			
Pumping Rate (gpm)	____					
Evacuation Method	____					

Constituents Sampled	Container Description	Number	Preservative
SVOC			

Sampling Personnel G. WILLIAMS

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.: NY000008.0210 | Page 1 of 1

Site Location: Bethpage NY | Date: 6/28/00

Site/Well No.: FW-03 | Replicate No.: | Code No.:

Weather: Sunny 85° | Sampling Time: Begin 11:30 End:

Evacuation Data

Measuring Point	1
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	64'
Depth to Water (ft bmp)	58.58
Water-Level Elevation (ft)	
Water Column in Well (ft)	5.42'
Casing Diameter/Type	2" PVC
Gallons in Well	0.88
Gallons Pumped/Bailed Prior to Sampling	2.6
Sample Pump Intake Setting (ft bmp)	63'
Purge Time	begin ____ end ____
Pumping Rate (gpm)	0.5
Evacuation Method	

Field Parameters

Field Parameters	I	V_1	V_2	V_3	V_4
Color					Color.
Odor					None
Appearance					
pH (s.u.)	8.17	7.56	7.37	7.26	7.18
Conductivity (mS/cm)					
(µmhos/cm)	160	150	150	145	150
Turbidity (NTU)					
Temperature (°C)	18.6	16.6	16.5	16.5	16.5
Dissolved Oxygen (mg/L)					
Salinity (%)					
Sampling Method					
Remarks					

Constituents Sampled	Container Description	Number	Preservative
VOC's			

Sampling Personnel: GW/FR

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. NY000008.0212 Page 1 of ____

Site Location: ____ Date: 6/27/00

Site/Well No.: MW-3R Replicate No.: Rep 1 Code No.: ____

Weather: Sunny 85° Sampling Time: Begin ____ End ____

Evacuation Data

Measuring Point	'
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	55
Depth to Water (ft bmp)	37.28
Water-Level Elevation (ft)	
Water Column in Well (ft)	17.72
Casing Diameter/Type	2"
Gallons in Well	2.84
Gallons Pumped/Bailed Prior to Sampling	8.5
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 11:00 end ____
Pumping Rate (gpm)	Q≈1
Evacuation Method	

Field Parameters

	I	V_1	V_2	V_3	V_4	V_5
Color						
Odor						
Appearance						
pH (s.u.)	5.93	5.95	5.89	5.89	5.89	5.91
Conductivity (mS/cm)	90	75	75	75	75	75
(µmhos/cm)						
Turbidity (NTU)	7200	7200	54.6	26.0	13	11.6
Temperature (°C)	19.0	19.5	18.5	17.7	17.1	19.2
Dissolved Oxygen (mg/L)						
Salinity (%)						
Sampling Method						

Remarks: ____

Constituents Sampled	Container Description	Number	Preservative
Cd/Cr			

Sampling Personnel: GW/FR

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

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NORTHROP-GRUMMAN Project No. NY000008021.0002 Page 1 of ____

Site Location: BETHPAGE NY. Date 7-11-00

Site/Well No. GM-13D Replicate No. ____ Code No. ____

Weather CLEAR 80° Sampling Time: Begin 9:30 End 11:30

Evacuation Data	
Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	210.00
Depth to PACKER (ft bmp)	199.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	11.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
PACKER PRESSURE Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 9:45 end 11:10
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters	I	1V	2V	3V
Color				COLORLESS
Odor				MODERATE
Appearance				CLEAR
pH (s.u.)	5.53	5.35	4.96	4.94
Conductivity (µmhos/cm)	170	175	168	175
Turbidity (NTU)				
Temperature (°C)	18.1	17.4	17.6	18.7
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method	DEDICATED BLADDER P			
Remarks	DTW - 45.19			
	5 GAL PAST - 111½			

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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 _____ Project No. NY000008.0210 Page 1 of _____

Site Location GRUMMAN Date 6/26/00

Site/Well No. GM-14 Replicate No. _____ Code No. _____

Weather Sunny 90° Sampling Time: Begin _____ End _____

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	55.00
Depth to Water (ft bmp)	44.88'
Water-Level Elevation (ft)	
Water Column in Well (ft)	10.12
Casing Diameter/Type	~~0.65~~ 4"
Gallons in Well	6.578 Gal
Gallons Pumped/Bailed Prior to Sampling	20
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 13:52 end _____
Pumping Rate (gpm)	Q= 1 GPM
Evacuation Method	

Field Parameters

	I	W.	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	6.07	5.71	5.66	5.61
Conductivity (mS/cm)	115	115	115	110
(µmhos/cm)				
Turbidity (NTU)				
Temperature (°C)	22.0	22.4	21.6	21.9
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				
Remarks				

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel G.W. / F.R.

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. NY000080210 00002 | Page 1 of ____

Site Location: BETHPAGE NY | Date: 7-11-00

Site/Well No.: GM-15D | Replicate No.: ____ | Code No.: ____

Weather: CLEAR 80° | Sampling Time: Begin 1:45 End 1:05

Evacuation Data	
Measuring Point	'
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	105.00
Depth to PACKER (ft bmp)	94.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	11.00
Casing Diameter/Type	4(0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
PACKER PRESSURE Sample Pump Intake Setting (ft bmp)	80 PSI
Purge Time	begin 11:55 end 12:45
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters	I	1J	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	4.83	4.74	4.69	4.69
Conductivity (mS/cm) (µmhos/cm)	190	200	200	205
Turbidity (NTU)				
Temperature (°C)	21.7	21.7	19.3	20.4

Dissolved Oxygen (mg/L): ____

Salinity (%): ____

Sampling Method: ____

Remarks: DTW - 47.20

5 GAL PAILS IIII½

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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.: NY000009.0210 | Page 1 of ____

Site Location: ____ | Date: 6/27/00

Site/Well No.: 165R | Replicate No.: ____ | Code No.: ____

Weather: Sunny 85° | Sampling Time: Begin ____ End ____

Evacuation Data

Measuring Point	"
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	70'
Depth to Water (ft bmp)	49.65'
Water-Level Elevation (ft)	
Water Column in Well (ft)	20.35'
Casing Diameter/Type	4"
Gallons in Well	13.23
Gallons Pumped/Bailed Prior to Sampling	39.7
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 9:40 end ____
Pumping Rate (gpm)	1.5 G.P.M. T=26 V=8.5
Evacuation Method	

I 9:42
V1 9:51
V2 10:00
V3 10:08

Field Parameters

	I 9:42	V1 9:51	V2 10:00	V3 10:08
Color				
Odor				
Appearance				
pH (s.u.)	5.85	5.81	5.76	5.81
Conductivity (mS/cm)	105	100	95	95
(µmhos/cm)				
Turbidity (NTU)	23.1	8.88	4.56	1.90
Temperature (°C)	20.8	19.9	19.4	20.0
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				

Remarks: ____

Constituents Sampled	Container Description	Number	Preservative
VOC's			
Ca/Cd			

Sampling Personnel: GW / FR

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.	NY000080210 0002	Page	1 of
Site Location	BETHPAGE NY			Date	7-17-00
Site/Well No.	GM-16I	Replicate No.		Code No.	
Weather	CLEAR 83°	Sampling Time:	Begin 2:40	End	4:30

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	145.00
Depth to Water (ft bmp)	134.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	11.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake~~ PACKER CROSSOVER Setting (ft bmp)	90 PBS
Purge Time	begin 2:55 end 4:15
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

	I	1V	2V	3V
Color				Brown tan
Odor				SLIGHT
Appearance				Cloudy
pH (s.u.)	7.05	6.57	6.48	6.49
Conductivity ([redacted]) (µmhos/cm)	260	205	205	210
Turbidity (NTU)				
Temperature (°C)	21.1	21.0	19.4	19.9
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				

Remarks: DTW 50.40
5 GAL PAILS

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WELDON

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	mililiter	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.: NY000008.0210 | Page 1 of ____

Site Location: Bethpage NY | Date: 7/6/00

Site/Well No.: 17S | Replicate No.: ____ | Code No.: ____

Weather: Sunny 82° | Sampling Time: Begin 16:05 | End ____

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	48'
Depth to Water (ft bmp)	45.73'
Water-Level Elevation (ft)	
Water Column in Well (ft)	2.27
Casing Diameter/Type	PVC 4"
Gallons in Well	1.48
Gallons Pumped/Bailed Prior to Sampling	4.43
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	Yellow tint
Odor	None
Appearance	Cloudy
pH (s.u.)	~~NR~~ 6.72
Conductivity (µmhos/cm)	~~NR~~ 112
Turbidity (NTU)	
Temperature (°C)	21.2
Dissolved Oxygen (mg/L)	
Salinity (%)	
Sampling Method	Bailing
Remarks	

Constituents Sampled	Container Description	Number	Preservative
VOC's			

Sampling Personnel: ____

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.: NY000008.0210 | Page 1 of 1

Site Location: Bethpage NY | Date: 6/27/00

Site/Well No.: 185 | Replicate No.: | Code No.:

Weather: Hazy 88° | Sampling Time: Begin | End

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	67'
Depth to Water (ft bmp)	43.29'
Water-Level Elevation (ft)	
Water Column in Well (ft)	23.71
Casing Diameter/Type	2"
Gallons in Well	3.79
Gallons Pumped/Bailed Prior to Sampling	11.38
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 14:25 end 14:40
Pumping Rate (gpm)	1
Evacuation Method	

Field Parameters	I	V_1	V_2	V_3
Color				CLARITAS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	6.45	6.23	6.13	6.05
Conductivity (mS/cm)	90	90	88	88
(µmhos/cm)				
Turbidity (NTU)				
Temperature (°C)	22.5	22.3	22.1	21.8
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				
Remarks				

Constituents Sampled	Container Description	Number	Preservative
VOC's			

Sampling Personnel: GW/FR

Well Casing Volumes

Gal./Ft.				
	1-⅛" = 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. M0000080210 0002 Page 1 of ____

Site Location BETHPAGE NY Date 7-17-00

Site/Well No. GM-8I Replicate No. ____ Code No. ____

Weather CLEAR-83° Sampling Time: Begin 1:05 End 2:35

Evacuation Data	
Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	105.00
Depth to Water (ft bmp)	94.00
Water-Level Elevation (ft)	—
Water Column in Well (ft)	11.00
Casing Diameter/Type	4(0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake~~ PACKER PRESSURE Setting (ft bmp)	70 PSI
Purge Time	begin 1:20 end 2:20
Pumping Rate (gpm)	
Evacuation Method	DEDICATED BLADDER PUMP

Field Parameters	I	10	20	30
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	5.96	6.03	5.73	5.75
Conductivity (~~mS/cm~~) (µmhos/cm)	76	78	78	78
Turbidity (NTU)				
Temperature (°C)	20.0	20.2	19.5	20.0
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method PUMP DISCHARGE

Remarks 5 GALLON PAILS IIII½

DTW 44.4

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel G. WILLIAMS

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	mililiter	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. NY000000802100 00002 Page 1 of ____

Site Location BETHPAGE Date 7-11-00

Site/Well No. 6M-20L Replicate No. ____ Code No. ____

Weather CLEAR 82° Sampling Time: Begin 1:40 End 2:52

Evacuation Data

Measuring Point	____
MP Elevation (ft)	____
Land Surface Elevation (ft)	____
Sounded Well Depth (ft bmp)	105.00
Depth to Packer (ft bmp)	94.00
Water-Level Elevation (ft)	____
Water Column in Well (ft)	11.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
Sample Pump Intake Setting (ft bmp)	TOP SS
Purge Time	begin 1:55 end 2:50
Pumping Rate (gpm)	____
Evacuation Method	____

Field Parameters

	I	IJ	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLOUDY
pH (s.u.)	10.55	10.68	10.69	10.73
Conductivity (µmhos/cm)	220	240	220	205
Turbidity (NTU)				
Temperature (°C)	19.2	16.3	16.2	16.2

Dissolved Oxygen (mg/L) ____

Salinity (%) ____

Sampling Method DEDICATED BLADDER PUMP

Remarks DTW 47.08

SEAL PASS 1

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel G. WILLIAMS

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
	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NORTHROP-GRUMMAN | Project No.: N1400008021000002 | Page: 1 of ____

Site Location: BETHPAGE NY | Date: 7-11-08

Site/Well No.: GM-20D | Replicate No.: ____ | Code No.: ____

Weather: CLEAR 82° | Sampling Time: Begin 2:55 | End 4:05

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	226.00
Depth to Water (ft bmp)	215.00
Water-Level Elevation (ft)	—
Water Column in Well (ft)	11.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
Packer [illegible] Setting (ft bmp)	105 PSI
Purge Time	begin 2:58 end 3:55
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Field Parameters	I	1J	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	9.25	7.79	7.48	7.43
Conductivity [illegible] (µmhos/cm)	80	75	75	75
Turbidity (NTU)				
Temperature (°C)	19.7	19.5	17.6	17.9
Dissolved Oxygen (mg/L)				

Salinity (%): ____

Sampling Method: ____

Remarks: DTW 42.010

5 GAL PASS MW3

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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
		NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: GRUMMAN Northrop | Project No.: NY000008.0210 | Page 1 of ____

Site Location: OFF SITE S. OF S. BASINS | Date: 6/26/00

Site/Well No.: GM-21S | Replicate No.: ____ | Code No.: ____

Weather: SUNNY 90° | Sampling Time: Begin ____ End ____

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	67.0'
Depth to Water (ft bmp)	37.92'
Water-Level Elevation (ft)	
Water Column in Well (ft)	29.08'
Casing Diameter/Type	2"
Gallons in Well	4.65 Gal.
Gallons Pumped/Bailed Prior to Sampling	13.95
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 15:08 end ____
Pumping Rate (gpm)	1 GPM
Evacuation Method	

Field Parameters

Field Parameters	I	V1	V2	V3	
Color					C
Odor					N
Appearance					C
pH (s.u.)	8.78	7.08	6.56	6.45	6
Conductivity (mS/cm)	55	55	55	55	5
(µmhos/cm)					
Turbidity (NTU)					
Temperature (°C)	20.1	19.4	18.4	19.2	19
Dissolved Oxygen (mg/L)					
Salinity (%)					
Sampling Method					

Remarks: ____

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: GW/FR

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
		NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NORTHROP GRUMMAN | Project No.: NY000080210 00002 | Page: 1 of ____

Site Location: BETHPAGE NY | Date: 7-10-00

Site/Well No.: GM-21I | Replicate No.: ____ | Code No.: ____

Weather: CLEAR 85° | Sampling Time: Begin 11:00 End 12:50

Evacuation Data

Measuring Point	"
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	140.00
Depth to PACKER (ft bmp)	129.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	11.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake~~ Setting (ft bmp)	90 PSI
Purge Time	begin 11:50 end 12:40
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Field Parameters	I	1J	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	10.45	10.32	10.40	10.15
Conductivity ~~(mS/cm)~~ (µmhos/cm)	120	115	118	110
Turbidity (NTU)				
Temperature (°C)	19.7	18.7	16.7	18.7
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				

Remarks: 5 GAL PAILS 1111 1/2

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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
Low-Flow Groundwater Sampling Log

Project Number: NY000008.0210 Task: _____ Well ID: HN24I
Date: 6/28/00 Sampled By: FW/FR
Sampling Time: _____ Recorded By: _____
Weather: Sunny 78° Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: PVC Purge Method: Low flow
Casing Diameter: 4" Purge Rate: 450 ml/min
Total Depth: 158' Total Volume Purged: 31.5 L:4R
Depth to Water: 58.95 Pump Intake Depth: _____
Water Column: 99.05 Pump on: 9:40 Off: _____
Gallons/Foot: _____ Parameters Sampled: VOC
Gallons in Well: _____

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (S.U./units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
9:40	450ml/min		383 →		7.42	250	21.4	58.95	5.6	
9:45			445 →		7.25	265	19.6		5.6	
9:50				470	7.05	259	19.5		5.0	
9:55				515	6.81	253	20.1		4.65	
10:00				664	6.72	245	21.1	58.94	4.20	
10:05				680	6.62	239	21.8		4.40	
10:10				605	6.57	231	19.8		4.25	
10:15				696	6.51	225	19.8		3.90	
10:20				654	6.47	223	20.0		3.80	
10:25				668	6.46	221	21.0	58.94	3.80	
10:30				683	6.43	220	21.2		3.90	
10:35				684	6.42	222	21.5		3.90	
10:40			*	265	6.40	222	22.0		3.80	
10:45				270	6.38	222	22.3		3.80	
10:50				265	6.37	222	22.6	58.95	3.60	

Well Secure: _____ Purge Water Disposal: _____
Color: Colorless Turbidity(qualitative): Clear
Odor: None Other (OVA, HNU,etc.): _____
* New EH meter -

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NV000008.0210 Task: 00002 Well ID: HN-28I
Date: 7/6/00 Sampled By: GW
Sampling Time: _____ Recorded By: FR
Weather: Sunny 81° Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: PVC Purge Method: Submersible redi-flo
Casing Diameter: 4" Purge Rate: 450 ml/min
Total Depth: 155' Total Volume Purged: _____
Depth to Water: 56.14' Pump Intake Depth: _____
Water Column: _____ Pump on: 11:59 Off: _____
Gallons/Foot: _____ Parameters Sampled: _____
Gallons in Well: _____

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
12:00	450			-25	10.93	210	20.0	55.54	4.4	
12:05				-10	10.93	200	18.9	57.55	4.4	
12:10				-5	10.93	195	18.9		4.4	
12:15				0	10.93	205	18.4	57.62	4.3	
12:20				5	10.94	200	18.6		4.3	
12:25				5	10.90	205	19.1		4.3	
12:30				10	10.92	205	18.6	57.64	4.2	
12:35				10	10.91	205	18.4		4.1	
12:40				10	10.88	202	19.1		4.0	
12:45				15	10.85	202	19.3	57.64	3.9	
12:50				15	10.84	201	18.7		3.8	
12:55				20	10.78	198	19.3	57.62	3.7	
13:00		~8 gal		20	10.76	195	19.3		3.9	

Well Secure: _____ Purge Water Disposal: _____
Color: COLORLESS Turbidity(qualitative): CLEAR
Odor: NONE Other (OVA, HNU,etc.): _____

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY000008.0210 Task: 0002 Well ID: HN29I
Date: 6/28/00 Sampled By: GW
Sampling Time: _____ Recorded By: F.R.
Weather: Sunny 84° Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: PVC Purge Method: _____
Casing Diameter: 4" Purge Rate: 500 ml/min.
Total Depth: 130' Total Volume Purged: _____
Depth to Water: 49.57 Pump Intake Depth: _____
Water Column: 80.43 Pump on: _____ Off: _____
Gallons/Foot: 0.65 Parameters Sampled: _____
Gallons in Well: 52.3

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
11:40	500			160	11.16	192	19.8	49.57	6.5	
11:45				165	11.14	182	20.4		6.5	
11:50			180	195	11.11	195	21.7		6.2	
11:55				180	11.09	198	22.1		5.7	
12:00				180	11:09	182	22.2		5.7	
12:05				155	11.07	192	22.9		5.5	
12:10				160	11.07	192	23.0		5.4	
12:15				145	11.06	180	23.1	51.05	5.3	
12:20				150	11.04	185	23.0		5.4	
12:25				140	11.03	190	23.3		5.5	
12:30				145	11.00	192	23.5		5.3	
12:35				140	11.01	195	21.0		5.7	
12:40				145	10.96	195	22.3		5.8	
12:45				145	10.96	190	21.8		5.6	
12:50				150	10.92	188	22.4	51.23	5.7	
12:55				150	10.90	192	22.9		5.5	

Well Secure: _____ Purge Water Disposal: _____
Color: COLORLESS Turbidity(qualitative): CLEAR
Odor: NONE Other (OVA, HNU,etc.): _____

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: N4000008.0210 Task: 00002 Well ID: HN-29D
Date: 7/6/00 Sampled By: GW
Sampling Time: _____ Recorded By: FR
Weather: Sunny 82° Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: PVC Purge Method: Low flow
Casing Diameter: 4" Purge Rate: ~~400~~ 450ml/min
Total Depth: 220 Total Volume Purged: _____
Depth to Water: 50.20 Pump Intake Depth: _____
Water Column: _____ Pump on: _____ Off: _____
Gallons/Foot: _____ Parameters Sampled: _____
Gallons in Well: _____

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
13:55	450ml/m			120	8.80	120	19.8	50.20	7.5	
14:00				135	7.69	112	19.0		7.3	
14:05				175	7.05	112	18.9	50.20	7.3	
14:10				190	6.59	110	18.4		7.2	
14:15				200	6.44	105	18.4	50.20	7.2	
14:20				205	6.20	105	18.6		7.1	
14:25				210	6.07	108	18.9		6.9	
14:30				220	5.98	105	18.7	50.19	6.8	
14:35				220	5.92	108	19.9		6.5	
14:40				220	5.89	112	21.3	50.19	6.5	
14:45				225	5.85	112	21.6		6.5	
14:50				225	5.78	110	21.1		6.4	
14:55				225	5.72	110	21.0		6.5	
15:00		9.0		230	5.70	112	21.3		6.5	

Well Secure: _____ Purge Water Disposal: _____
Color: COLORLESS Turbidity(qualitative): CLEAR
Odor: NONE Other (OVA, HNU,etc.): _____

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY000080210 Task: 00002 Well ID: GM-33D-2
Date: 7-11-00 Sampled By: GW
Sampling Time: Recorded By: GW
Weather: CLEAR Coded Replicate No.:

WELL IMFORMATION

Casing Material: Purge Method: LOW FLOW
Casing Diameter: Purge Rate: 450 ml/min
Total Depth: Total Volume Purged:
Depth to Water: 52.05 Pump Intake Depth:
Water Column: Pump on: Off:
Gallons/Foot: Parameters Sampled:
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
4:40	450 ml/m			90	8.84	105	19.3	52.05	5.5	
4:45				90	8.79	105	19.1		5.2	
4:50				90	8.74	105	19.2	52.10	5.0	
4:55				110	8.14	105	19.2		4.9	
5:00				110	8.03	105	19.1		4.8	
5:05				100	7.93	100	18.4	52.11	4.7	
5:10				180	7.72	100	18.1		5.0	
5:15				130	7.60	95	18.3		5.2	
5:20				155	6.97	85	18.3	52.14	5.3	
5:25				195	6.07	80	18.4		5.5	
5:30				230	5.36	80	18.4		6.0	
5:35				240	5.13	80	18.4	52.16	6.0	
5:40	√			240	5.05	80	18.4		6.0	
5:45		9G		250	5.00	80	18.4		6.0	

Well Secure: Purge Water Disposal:
Color: COLORLESS Turbidity(qualitative): CLEAR
Odor: ~~[illegible]~~ MODERATE Other (OVA, HNU,etc.):

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY000008.0210 Task: 00002 Well ID: 34D
Date: 7/5/00 Sampled By: GW
Sampling Time: 13:40 Recorded By: FR
Weather: Sunny 85° Coded Replicate No.:

WELL IMFORMATION

Casing Material: Steel Purge Method: Low Flow
Casing Diameter: 2" Purge Rate: 450 ml/min
Total Depth: 319 Total Volume Purged:
Depth to Water: 17.19 Pump Intake Depth:
Water Column: Pump on: 13:44 Off:
Gallons/Foot: Parameters Sampled:
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
13:45	450 ml			150	7.86	155	21.2	17.19	0.9	
13:50				135	8.13	150	19.0	"	0.5	
13:55				<-50	8.74	145	18.8		0.3	
14:00				<-50	8.92	140	18.7		0.3	
14:05				<-50	9.38	133	18.6		0.3	
14:10				-30	8.58	155	18.6	17.20	0.3	
14:15				<-50	7.56	162	18.6		0.3	
14:20				<-50	7.19	160	18.7		0.3	
14:25				<-50	6.92	157	18.6		0.3	
14:30				<-50	6.76	155	18.5	17.25	0.3	
14:35				—	—	—	—	—	—	
14:40				-50	6.55	152	18.3		0.4	
14:45				-30	6.43	155	18.5		0.4	
14:50				-20	6.35	195	18.7		0.4	
14:55		8.5		-35	6.33	155	18.7	17.26	0.4	

Well Secure: Purge Water Disposal:
Color: COLORLESS Turbidity(qualitative): CLEAR
Odor: NONE Other (OVA, HNU,etc.):

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY000008.0210 Task: 00002 Well ID: 3402
Date: 7/5/00 Sampled By: GW
Sampling Time: _____ Recorded By: FR
Weather: Sunny 85° Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: S/s / Purge Method: LOW FLOW
Casing Diameter: 4" Purge Rate: _____
Total Depth: 520' Total Volume Purged: _____
Depth to Water: 19.40 Pump Intake Depth: _____
Water Column: _____ Pump on: _____ Off: _____
Gallons/Foot: _____ Parameters Sampled: _____
Gallons in Well: _____

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
11:55	450 mL			55	6.09	68	19.3	19.40	1.8	
12:00				65	6.29	60	18.5		1.2	
12:05				35	6.55	58	18.0		0.8	
12:10				40	6.76	55	17.7	19.22	0.5	
—										
12:20				65	7.23	60	17.7		0.4	
12:25				-5	7.03	58	17.8		0.5	
12:30				85	6.16	65	17.8		0.9	
12:35				125	5.82	75	17.8	19.20	1.4	
12:40				150	5.61	75	17.7	19.10	1.9	
12:45				165	5.51	78	18.2		2.2	
12:50				170	5.50	78	19.7		2.2	
12:55				165	5.54	80	21.5		2.5	
13:05				160	5.51	80	22.5	19.25	2.8	
13:10		10 GAL		165	5.51	80	22.9		2.5	

Well Secure: _____ Purge Water Disposal: _____
Color: GREY TINT Turbidity(qualitative): CLOUDY
Odor: NONE Other (OVA, HNU,etc.): _____

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project NORTHROP-GRUMMAN Project No. NY000008021000052 Page 1 of

Site Location BETHPAGE NY Date 7-14-00

Site/Well No. GM-35D-2 Replicate No. [redacted] Code No.

Weather CLEAR 65° Sampling Time: Begin [redacted]9:30 End 11:05

Evacuation Data

Measuring Point TOC

MP Elevation (ft)

Land Surface Elevation (ft)

Sounded Well Depth (ft bmp) 530.00

Depth to Water (ft bmp) 507.00

Water-Level Elevation (ft)

Water Column in Well (ft) 23.00

Casing Diameter/Type 4" (0.65)

Gallons in Well 14.95

Gallons Pumped/Bailed Prior to Sampling 14.95

~~PACKER PRESSURE~~ Sample Pump Intake Setting (ft bmp) 225

Purge Time begin 9:50 end 11:35

Pumping Rate (gpm)

Evacuation Method

Field Parameters

	I	1U	2U	3U
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	5.60	4.85	4.89	4.90
Conductivity (~~mS/cm~~) (µmhos/cm)	55	60	58	52
Turbidity (NTU)				
Temperature (°C)	18.7	19.7	19.8	19.8
Dissolved Oxygen (mg/L)				

Salinity (%)

Sampling Method ~~DEDICATED~~ BLADDER PUMP

Remarks ORP - 42.9 5 GAL PAILS FULL

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel G. WILLIAMS

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. N4000082210.0002 Page 1 of

Site Location: BETHPAGE NY Date 7-14-00

Site/Well No. GM-36D Replicate No. Code No.

Weather CLEAR 80° Sampling Time: Begin 12:40 End 1:05

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	214.00
Depth to Water (ft bmp)	202.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	12.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.80
Gallons Pumped/Bailed Prior to Sampling	7.4
Sample Pump Intake Setting (ft bmp)	110
Purge Time	begin 12:52 end 1:50
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Field Parameters	I	1S	2S	3S
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	5.25	5.01	4.96	4.91
Conductivity (µmhos/cm)	78	75	78	75
Turbidity (NTU)				
Temperature (°C)	20.4	19.5	19.0	19.1
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				

Remarks: DTW 38.17

5 GAL PAILS TILL

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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. NY000008021000002 Page 1 of ____

Site Location: BETHPAGE NY Date: 7-18-00

Site/Well No.: GM-37D Replicate No. ____ Code No. ____

Weather: CLEAR 82° Sampling Time: Begin 9:15 End 11:42

Evacuation Data		Field Parameters	I	II	III	IV
Measuring Point		Color				COLORLESS
MP Elevation (ft)		Odor				NONE
Land Surface Elevation (ft)		Appearance				CLEAR
Sounded Well Depth (ft bmp)	262.00	pH (s.u.)	4.60	4.34	4.27	4.26
Depth to Water (ft bmp)	240.00	Conductivity (µmhos/cm)	150	140	140	140
Water-Level Elevation (ft)	—	Turbidity (NTU)				
Water Column in Well (ft)	22.00	Temperature (°C)	20.0	20.4	17.9	18.0
Casing Diameter/Type	4 (0.65)	Dissolved Oxygen (mg/L)				
Gallons in Well	14.30	Salinity (%)				
Gallons Pumped/Bailed Prior to Sampling	45.00	Sampling Method				
PACKER PRESSURE Sample Pump Intake Setting (ft bmp)		Remarks	DTW - 41.99			
Purge Time	begin 9:30 end 11:40		5 GAL PAILS IIII			
Pumping Rate (gpm)						
Evacuation Method						

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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 N-GRUMMAN Project No. NY000088210 0002 Page 1 of ____

Site Location BETHPAGE NY Date 7-13-00

Site/Well No. GM-370-2 Replicate No. ____ Code No. ____

Weather CLEAR 85° Sampling Time: Begin 11:43 End ____

Evacuation Data	
Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	390.00
Depth to Water (ft bmp)	367.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	23.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	~~45.00~~ 14.95
Gallons Pumped/Bailed Prior to Sampling	45.00
PACKER PRESSURE ~~Sample Pump Intake~~ Setting (ft bmp)	180 PSI
Purge Time	begin 11:45 end
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters	I	1V	2V	3V
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	4.44	4.37	4.32	4.27
Conductivity (~~mS/cm~~) (µmhos/cm)	172	175	175	178
Turbidity (NTU)				
Temperature (°C)	18.7	18.6	19.0	18.6
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method DEDICATED BLADDER PUMP

Remarks OTW 41.25
5 GAL PAILS ~~IIII~~ IIII

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel G. WILLIAMS

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	mililiter	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. NY000580210 00002 Page 1 of ____

Site Location: BETHPAGE NY Date: 7-12-00

Site/Well No.: GM-38D Replicate No.: MS/MSD Code No. ____

Weather: CLEAR 85° Sampling Time: Begin 1:35 End ____

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	340.00
Depth to Water (ft bmp)	317.00
Water-Level Elevation (ft)	—
Water Column in Well (ft)	23.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	14.95
Gallons Pumped/Bailed Prior to Sampling	45.00
~~Sample Pump Intake~~ PACKER PRESSURE Setting (ft bmp)	145 PSI
Purge Time	begin 1:40 end ____
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Field Parameters	I	W	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	5.19	4.74	4.78	4.75
Conductivity (µmhos/cm)	85	75	78	78
Turbidity (NTU)				
Temperature (°C)	18.9	18.1	19.1	19.2
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				
Remarks	DTW-41.83			
	5 GAL PAILS IIII			

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WELDEAM

Well Casing Volumes

Gal./Ft.				
	1-⅛" = 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
		NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project NORTHROP-GRUMMAN Project No. NY000008021000002 Page 1 of ____

Site Location BETHPAGE NY Date 7-12-00

Site/Well No. 6M-38D-2 Replicate No. REP-2 Code No. ____

Weather CLEAR 82° Sampling Time: Begin 11:30 End 1:35

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	495.00
Depth to Water (ft bmp)	472.00
Water-Level Elevation (ft)	—
Water Column in Well (ft)	23.00
Casing Diameter/Type	~~4"~~ 6" 6.65
Gallons in Well	14.95
Gallons Pumped/Bailed Prior to Sampling	45.00
Sample Pump Intake Setting (ft bmp)	220 PSI
Purge Time	begin 11:50 end 1:20
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

	1	1J	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	4.79	4.42	4.47	4.40
Conductivity (µmhos/cm)	65	75	75	75
Turbidity (NTU)				
Temperature (°C)	17.3	18.2	18.2	18.4
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				

Remarks DTW 44.70

5 GAL PAILS IIIIII

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel B. WILLIAMS

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. NY 60000820.0000 — Page 1 of ____

Site Location: BETHPAGE, NY — Date: 7-18-00

Site/Well No.: BM-70D-2 — Replicate No. ____ — Code No. ____

Weather: CLEAR 85° — Sampling Time: Begin 3:30 — End ____

Evacuation Data		Field Parameters	I	W	2W	3W
Measuring Point	TOC	Color				COLORLESS
MP Elevation (ft)		Odor				NONE
Land Surface Elevation (ft)		Appearance				CLEAR
Sounded Well Depth (ft bmp)	330.00	pH (s.u.)	5.82	5.44	5.43	6.72
Depth to Water (ft bmp)	308.00	Conductivity (µmhos/cm)	80	70	80	80
Water-Level Elevation (ft)	—	Turbidity (NTU)				
Water Column in Well (ft)	22.00	Temperature (°C)	20.0	18.4	19.1	19.2
Casing Diameter/Type	4(0.65)	Dissolved Oxygen (mg/L)				
Gallons in Well	14.30	Salinity (%)				
Gallons Pumped/Bailed Prior to Sampling	43.00	Sampling Method				
Sample Pump Intake Setting (ft bmp)	160	Remarks	DTW 44.29			
Purge Time	begin 337 end ____		5 GAL PAILS TILL			
Pumping Rate (gpm)						
Evacuation Method						

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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. NY000608022.0000 Page 1 of ____

Site Location: BETHPAGE NY Date: 7-12-04

Site/Well No.: GM-710.2 Replicate No. ____ Code No. ____

Weather: CLEAR 84° Sampling Time: Begin 4:15 End 5:55

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	464.00
Depth to Water (ft bmp)	442.00
Water-Level Elevation (ft)	—
Water Column in Well (ft)	22.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	14.30
Gallons Pumped/Bailed Prior to Sampling	43.00
PACKER PRESSURE / Sample Pump Intake Setting (ft bmp)	230 PSI
Purge Time	begin 4:30 end 5:50
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Field Parameters	I	IU	2U	3U
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	5.96	5.08	5.04	4.98
Conductivity (µmhos/cm)	75	75	75	75
Turbidity (NTU)				
Temperature (°C)	20.4	19.0	18.9	18.8
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: DEDICATED BLADDER PUMP

Remarks: DTW 44.13

5 GAL PAILS IN 11

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel: G. WILLIAMS

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
		NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY000008.0210 Task: 00002 Well ID: 10627
Date: 7/5/00 Sampled By: GW
Sampling Time: _____ Recorded By: ER
Weather: Sunny 85° Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: _____ Purge Method: Low flow
Casing Diameter: _____ Purge Rate: 450ml/min
Total Depth: 295 Total Volume Purged: _____
Depth to Water: 35.20' Pump Intake Depth: _____
Water Column: _____ Pump on: 16:15 Off: _____
Gallons/Foot: _____ Parameters Sampled: _____
Gallons in Well: _____

FIELD PARAMETER MEASUREMENTS

Time	Rate (ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
16:20	450ml/m			<-50	7.39	600	20.5	35.20'	1.2	
16:25				<-50	8.52	370	17.5		0.5	
16:30				<-50	8.54	55	17.4		0.8	
16:35				<-50	8.40	28	17.1	37.99	0.6	
16:40				<-50	8.45	30	17.4	37.85	0.5	
16:45				<-50	8.30	35	18.5	37.45	0.3	
16:50				<-50	8.28	38	18.3	37.27	0.3	
16:55				<-50	8.28	40	18.3		0.3	
17:00				<-50	8.28	45	18.2	37.03	0.3	
17:05				<-50	8.24	50	18.0		0.3	
17:10				<-50	8.27	55	17.9	36.97	0.3	
17:15				<-50	8.28	60	18.2	36.95	0.3	
17:20				<-50	8.30	72	18.5	36.94	0.3	
17:25		8GAL		<-50	8.30	75	18.5	36.94	0.3	

Well Secure: _____ Purge Water Disposal: _____
Color: COLORLESS Turbidity(qualitative): CLEAR
Odor: NONE Other (OVA, HNU,etc.): _____

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Grumman - Northrop | Project No. NY000008.0210 | Page 1 of ____

Site Location: Bethpage N.Y. | Date 6/27/00

Site/Well No. N10631 | Replicate No. ____ | Code No. ____

Weather: Hazy Sun 87° | Sampling Time: Begin ____ End ____

Evacuation Data

Measuring Point	,
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	67'
Depth to Water (ft bmp)	41.22'
Water-Level Elevation (ft)	
Water Column in Well (ft)	25.8
Casing Diameter/Type	
Gallons in Well	4.12
Gallons Pumped/Bailed Prior to Sampling	12.4
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 11:48 end ____
Pumping Rate (gpm)	1 GPM
Evacuation Method	

Field Parameters

Field Parameters	I	V_1	V_2	V_3	V_4	V_5
Color						BLK TR
Odor						SLT
Appearance						CLR
pH (s.u.)	6.50	6.33	6.21	6.11	6.09	6.07
Conductivity (mS/cm)	765	115	115	115	115	115
(µmhos/cm)						
Turbidity (NTU)	>200	7200	38	27	20	17.2
Temperature (°C)	22.1	21	21.6	21.2	21.3	21.7
Dissolved Oxygen (mg/L)						
Salinity (%)						
Sampling Method						
Remarks						

Constituents Sampled	Container Description	Number	Preservative
VOC's			
Cd/Cr			

Sampling Personnel: GW/FR

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 NV000008.0210 00002 | Project No. _____ | Page 1 of _____

Site Location O | Date 6/26/00

Site/Well No. N-10634 | Replicate No. _____ | Code No. _____

Weather Sunny 90° | Sampling Time: Begin _____ End _____

Evacuation Data

Measuring Point	'
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	67.0'
Depth to Water (ft bmp)	42.23
Water-Level Elevation (ft)	
Water Column in Well (ft)	24.77
Casing Diameter/Type	2"
Gallons in Well	3.96
Gallons Pumped/Bailed Prior to Sampling	11.88
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 15:46 end _____
Pumping Rate (gpm)	Q=1
Evacuation Method	

Field Parameters	I	V_1	V_2	V_3
Color				BROWN TA
Odor				NONE
Appearance				TURBID
pH (s.u.)	6.45	5.68	5.52	5.50
Conductivity (mS/cm)	100	100	100	100
(µmhos/cm)				
Turbidity (NTU)				
Temperature (°C)	20.3	20.3	19.9	19.3
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				
Remarks				

Constituents Sampled	Container Description	Number	Preservative
SEE COC			

Sampling Personnel GW/FR

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

Appendix D

Chain-Of-Custody Records

ARCADIS GERAGHTY & MILLER Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of —

Project Number/Name NJ000080210 00007

Project Location BETHPAGE

Laboratory SEVERN TRENT SVC

Project Manager B CARLO SANGIOVANNI

Sampler(s)/Affiliation G. WOOD F ROSSE

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOA TCL VOC (LMP)	7000-1260A	Remarks	Total
GM-14	L	6-26-00		2 01			2
GM-21S	↓	↓		2 02			2
N-10634				2 03			2
FB-6-26-00				2 04			2
TB-6-26-00				2 05			2
						6°C	
						PASSED RAD SCREEN	

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

Total No. of Bottles/ Containers 10

					Seal Intact?
Relinquished by: [signature]	Organization: ARCADIS GERAGHTY	Date 6/26/00	Time 5:00		
Received by: MIKE LOBIANC	Organization: STL-CT	Date 6/27/00	Time 9:15		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 STAPP

☐ In Person ☒ Common Carrier ☐ Lab Courier ☐ Other

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY000080210 00002
Project Location BETHPAGE NY
Laboratory SEVERN TRENT SHELTON
Project Manager CARLO SAN GIOVANNI
Sampler(s)/Affiliation G WILLIAMS / F ROSS

ANALYSIS / METHOD / SIZE: 40ml VOA VOC TCL (Dis)

7000-1260A

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40ml VOA VOC TCL (Dis)						Remarks	Total
HW 24 I	L	6-28-00	0613	2							2
HW 29 I			0714	2							2
FW-03			0815	2							2
FB 6-28-00			0916	2							2
TB-6-28-00			1017	2							2
			MZ	6-29-00							

5°C

PASSED RAD SCREEN

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

Total No. of Bottles/Containers 10

				Seal Intact?
Relinquished by: [signature]	Organization: ARCADIS G&M	Date 6/28/00	Time	(Yes) No N/A
Received by: [signature]	Organization: STL-CT	Date 6/29/00	Time 915	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization:	Date / /	Time	Yes No N/A

Special Instructions/Remarks:
REPORT TO DAVE STERN

☐ Lab Courier ☐ Other

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name N40000802100002

Project Location BETHPAGE

Laboratory SEVERN TRENT SHELTON

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation [illegible]
[illegible] ROSSI

ANALYSIS / METHOD / SIZE: 40ml VOA QC (UNP) — 7000-1379A

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40ml VOA QC (UNP)						Remarks	Total
01	GM-340-2	L	7-5-00		2							2
02	GM-340	↓	↓		2							2
03	N-10627	↓	↓		6*	→					One received with sample volume missing. ML 7-06-00	6
04	RFP-1	↓	↓		2							2
05	FB 7-5-00	↓	↓		2							2
06	TB 7-5-00	↓	↓		2							2

PASSED RAD SCREEN

6°C

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

Total No. of Bottles/Containers 16

Relinquished by: [illegible]	Organization: ARCADIS GERAGHTY MILLER	Date 7/5/00	Time 6:30	Seal Intact?	
Received by: [illegible]	Organization: STL-CT	Date 7/06/00	Time 9:15	(Yes) No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	

Special Instructions/Remarks:
* PLEASE USE THIS SAMPLE FOR AN MS/MSD QA/QC SAMPLE
REPORT TO DAVE STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX ☐ Lab Courier ☐ Other

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY000080210.0002

Project Location BETHPAGE NY

Laboratory SEVERN TRENT SHELTON

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation G. WILLIAMS / F. ROSSI

ANALYSIS / METHOD / SIZE: 40ml VOA VOC (unp)

1379A ~~1412A~~ 7000-1412A ml 7-10-00

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40ml VOA VOC (unp)						Remarks	Total
07	HN-28I	L	7-6-00	~~01~~	2							2
08	HN-29D	↓	↓	~~02~~	2							2
09	GM-17S	↓	↓	~~03~~	2							2
10	FB-7-6-00	↓	↓	~~04~~	2							2
11	FB-B	↓	↓	~~05~~	2							2
12	TB-7-6-00	↓	↓	~~06~~	2							2
				ml 7-10-00								

PASSED RAD SCREEN

5°C

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

Total No. of Bottles/Containers: 12

Relinquished by: [signature]	Organization: ARCADIS GERAGHTY & MILLER	Date 7/6/00	Time 6:00	Seal Intact? (Yes) No N/A
Received by: [signature]	Organization: STL-CT	Date 7/07/00	Time 9:15	
Relinquished by:	Organization:	Date / /	Time	Seal Intact? Yes No N/A
Received by:	Organization:	Date / /	Time	

Special Instructions/Remarks: REPORT TO DAVE STERN

ARCADIS GERAGHTY&MILLER

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

CHAIN-OF-CUSTODY RECORD

Page ______ of ______

Project Number/Name NY000080210 0000Z
Project Location BETHPAGE NY
Laboratory SEVERN - TRENT SHELTON
Project Manager CARLO SAN GIOVANNI
Sampler(s)/Affiliation G. WILLIAMS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOA VOC (WNS)						Remarks	Total
GM-21I	L	7-10-00		2							2
FW-01	↓	↓		2							2
TB 7-10-00	↓	↓		2							2

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

Total No. of Bottles/Containers: 6

Relinquished by: GHW	Organization: ARCADIS GM	Date 7/10/00	Time 4:40	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: KPYAM TO DAVE STERN

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

AG 05-0597

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

Project Number/Name NY000080210 00002

Project Location BETHPAGE N.Y.

Laboratory SEVERN-TRENT CHELTON

Project Manager CARLO SAM GIOVANNI

Sampler(s)/Affiliation G. WILLIAMS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml VOA (8260)						Remarks	Total
GM-13D	L	7-11-00		2							2
GM-15I	|	|		2							2
GM-20I	|	|		2							2
GM-20D	|	|		2							2
GM-33D-2	|	|		2							2
TB-7-11-00	V	↓		2							2

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

Total No. of Bottles/ Containers 12

				Seal Intact?
Relinquished by: [illegible]	Organization: ARCADIS GERAGHTY & MILLER	Date 7/11/00	Time 6:00	
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 DAWN STARN

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

AG 05-0597

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

Project Number/Name NY000060210 0002

Project Location SETAUKET N.Y.

Laboratory SEVERN TRENT SHELTON

Project Manager CHRISTIAN GEOUTWI

Sampler(s)/Affiliation G. WILLIAMS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOC (8260)						Remarks	Total
GM-38D-2	L	7-12-00		2							2
GM-38D-2	↓	↓		6*							6
GM-38D-2	↓	↓		2							2
REP-2	↓	↓		2							2
TB 7-12-00	↓	↓		2							2

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

Total No. of Bottles/Containers: 14

Relinquished by: HW	Organization: ARCADIS GERAGHTY + MILLER	Date 7/12/00	Time 6:05	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:

* PLEASE USE THIS SAMPLE FOR AN MS/MSD QA/QC SAMPLE

REPORT TO DAVE STERN

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

AG 05-0597

BWD

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NORTHPORT/GRUMMAN/BETHPAGE H2O

Project Location BETHPAGE NY.

Laboratory H2M

Project Manager —

Sampler(s)/Affiliation E. WILLIAMS AGM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 410 MI VOC (ASC)						Remarks	Total
GM-38D-2	L	7-12-00		2							2
GM-38D	↓	↓		2							2
GM-38D-2 TRIP BLK	↓	↓		2							2

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

Total No. of Bottles/ Containers: 6

					Seal Intact?
Relinquished by: [signature]	Organization: ARCADIS GERAGHTY & MILLER	Date 7/13/00	Time 8:50		
Received by: [signature]	Organization: H2M LABS	Date 7/13/00	Time [illegible]		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

AC 05 0587

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

Project Number/Name NY000020210 0002
Project Location BETHPAGE NY
Laboratory SEVERN TRENT SHELTON
Project Manager CARLO SAN GIOVANNI
Sampler(s)/Affiliation G. WILLIAMS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOAs VOC (VOA)						Remarks	Total
GM-37D	L	7-13-00		2							2
GM-37D-2	↓	↓		2							2
GM-70D-2	↓	↓		2							2
TB 7-13-00	↓	↓		2							2

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

Total No. of Bottles/Containers 8

Relinquished by: G. All	Organization: ARCADIS GERAGHTY MILLER	Date 7/13/00	Time 6:00	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)

AG 05-0597

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

Project Number/Name: NG [illegible] Bethpage
Project Location: Bethpage NY
Laboratory: H2M
Project Manager: –
Sampler(s)/Affiliation: G. Williams ARCADIS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOAs VOC (HCl)						Remarks	Total
GM-370	L	7-13-00		2							2
GM 370-2	↓	↓		2							2
GM-700-2	↓	↓		2							2

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

Total No. of Bottles/Containers: 6

Relinquished by: [illegible]	Organization: ARCADIS Geraghty Miller	Date 7/13/00	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 05-0597

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

Project Number/Name NORTHROP GRUMMAN/BETHPAGE HMD

Project Location BETHPAGE NY

Laboratory ALERT TRENT SHELTON

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation E LOSLISTANS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40ml VOA VOC (8260)						Remarks	Total
GM-35D-2	L	7-14-00		2							2
GM-36D	↓	↓		2							2
GM-36D-2				2							2
TB 7-14-00				2							2

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

Total No. of Bottles/Containers 8

Relinquished by: [illegible signature]	Organization: ARCADIS GERAGHTY MILLER	Date 7/14/00	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 05-0597

ARCADIS GERAGHTY & MILLER   Laboratory Task Order No./P.O. No. ______

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

Project Number/Name [illegible] Grumman/Bethpage #20

Project Location Bethpage NY

Laboratory H2M

Project Manager ______

Sampler(s)/Affiliation G. Williams AGM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOC 524.2 (HCl)						Remarks	Total
GM-35D-2	L	7-14-00		2							2
GM-36D	↓			2							2
GM-36D2	↓	✓		2							2

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

Total No. of Bottles/Containers: 6

Relinquished by: [illegible signature]	Organization: ARCADIS/[illegible]	Date 7/14/00	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 05-0597

ARCADIS GERAGHTY & MILLER

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

CHAIN-OF-CUSTODY RECORD

Page _____ of _____

Project Number/Name NY 000080210 0002

Project Location BETHPAGE NY

Laboratory SEVERN TRENT SHELTON

Project Manager CARLO SANGIOVANNI

Sampler(s)/Affiliation G. WILLIAMS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: HOMI VOA (8021)						Remarks	Total
GM-RI	L	7-17-00		2							2
GM-16I	↓	✓		2							2
TB 7-17-00	↓	✓		2							1

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

Total No. of Bottles/ Containers: 5

Relinquished by: [signature]	Organization: ARCADIS GERAGHTY & MILLER	Date 7/17/00	Time 5:00	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)

Appendix E

Data Validation Memoranda

ARCADIS Geraghty & Miller, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249-7600
Fax 631 249-7610

ENVIRONMENTAL

MEMO

To:
David Stern

Copies:

From:
Donna M. Brown and Francis K. Rossi

Date:
17 October 2000

Subject:
Data Validation of Volatile Organic Compound Groundwater Samples Collected for the second Quarter 2000 Monitoring Program, Northrop Grumman, Bethpage, New York (Project No. NY00008.0210.00004).

DATA VALIDATION

Thirty-four (34) groundwater samples, two field replicates, seven field blanks, and twelve trip blanks were collected from June 26, through July 31, 2000 in the vicinity of the Northrop Grumman site, Bethpage, New York. The samples were sent to Severn Trent Laboratories (STL) in Shelton, Connecticut for the analysis of volatile organic compounds (VOCs) following purge and trap GC/MS using New York State Department of Environmental Conservation (NYSDEC) 10/95 Method NYDEC 95-1.

Validation of the data was performed following the quality assurance/quality control (QA/QC) criteria set forth in the method, and the document "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" dated October 1999. Sample identification, collection dates, and laboratory-received dates are listed in Table 1. The quality of the data was acceptable with the appropriate qualifications described in this memorandum. Metals data were discussed in a separate memo.

The laboratory provided four data packages. The analytical data was provided by the laboratory in the sample delivery groups (SDG A1260, A1379, B1379, and C1379). The data validation results for these SDGs are discussed separately below.

HOLDING TIMES

The samples were analyzed within New York holding time requirements.

GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

INITIAL CALIBRATION

One initial calibration was performed. The compounds RRFs were found to be >0.05 and %RSD was found to be < 30%, except for the following:

Instrument ID: HP5970M Calibration Date: 6/23/00

Compound	% RSD
Acetone	37.6
Chloroethane	37.4

Associated samples: All samples.

The acetone and chloroethane results were qualified as estimated (J) if detected in the associated samples.

CONTINUING CALIBRATION

Two continuing calibrations were performed. All compounds had RRFs >0.05. The following compounds %D were found to be >25%:

Instrument ID: HP5970M Calibration Date: 06/30/00

Compound	% D
Acetone	-36.9
Carbon disulfide	-39.9

Associated samples: TB062600, FB062700, TB062700, FB062600, GM-14, GM-21S, N-10634, and MW-16SR.

Instrument ID: HP5970M Calibration Date: 07/01/00

Compound	% D
Chloroethane	29.7
Carbon disulfide	-35.5

Associated samples: N-10631, GM-18S, HW-24I, HW-29I, FW-03, FB062800, and TB062800.

The compound results were qualified as estimated (J) if detected and estimated (UJ) if not detected in the associated samples.

BLANKS

Two method blanks (VBLKM5 and VBLKM6) were analyzed with this SDG. No compounds were detected in the method blanks.

Three trip blanks and three field blanks were collected along with this sample set. The following compounds were detected in the blanks:

Trip blank (TB062600)

Compound	Concentration in micrograms per liter (ug/L)
Methylene chloride	2J

Associated samples: GM-14, GM-21S, and N-10634.

Field blank (FB062600)

Compound	Concentration in ug/L
Methylene chloride	5J

Associated samples: GM-14, GM-21S, and N-10634.

Trip blank (TB062700)

Compound	Concentration in ug/L
Methylene chloride	7J

Associated samples: MW-16SR, N-10631, and GM-18S

Field blank (FB062700)

Compound	Concentration in ug/L
Methylene chloride	2J
Chloroform	0.8J

Associated samples: MW-16SR, N-10631, and GM-18S

Trip blank (TB062800)

Compound	Concentration in ug/L
Methylene chloride	2J

Associated samples: HW-24I, HW-29I, and FW-03

Based on blank results, the following samples that tested positive were qualified as non-detect (U).

Compound	Associated Samples
Methylene Chloride	GM-14, GM-21S, N-10634, and MW-16SR

SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

MATRIX SPIKES/MATRIX SPIKE DUPLICATES

One matrix spike/matrix spike duplicate (MS/MSD) was analyzed with this sample set. Spike percent recoveries (%R) and relative percent differences (RPD's) were within control limits except for a RPD value. Qualification of data based on the MS/MSD results was not necessary.

LABORATORY CONTROL SAMPLES

Laboratory control sample percent recovery criteria were not meet for the following compounds: cis-1,3-dichloropropene was below limits and chloromethane and trans-1,3-dichloropropene were above limits. Based on laboratory control sample results, cis-1,3-dichloropropene, chloromethane and trans-1,3-dichloropropene were qualified as estimated (J) if detected and cis-1,3-dichloropropene was qualified as not usable (R) if not detected.

INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met. 1, 1, 2- Trichlorotrifluoroethane was on quantitation report for FW-03, HW-24I, and GM-14. This was not a target compound and was placed on the TIC forms. 1,

1, 2- Trichlorotrifluoroethane was not qualified with a N, because a calibration was conducted for the compound.

TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds were reported correctly.

SYSTEM PERFORMANCE

The performance of the instruments during analysis is considered acceptable.

OVERALL ASSESSMENT OF DATA

The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described in the above section.

SDG A1379

HOLDING TIMES

The samples were analyzed within New York holding time requirements.

GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

INITIAL CALIBRATION

One initial calibration was performed. The compounds RRFs were found to be >0.05 and %RSD was found to be < 30% for all compounds.

CONTINUING CALIBRATION

Three continuing calibrations were performed with this SDG. All compounds had RRFs >0.05. The following compounds %D were found to be >25% :

Instrument ID: HP5971L	Calibration Date: 07/16/00
Compound	% D
Bromomethane	31.5

Associated sample: GM-21I, FW-01I, GM-15I, GM-20I, GM-20D, and TB071000.

Instrument ID: HP5971L Calibration Date: 07/18/00

Compound	%D
Bromomethane	26.3
Acetone	42.0
Carbon tetrachloride	-25.4

Associated samples: GM-13D, GM-33D-2

The compound results were qualified as estimated (J) if detected and estimated (UJ) if not detected in the associated samples.

BLANKS

Three method blanks (VBLKLW, VBLKL5, and VBLKL9) were analyzed with this SDG. The following target compounds and TICs were detected in the method blanks:

Method Blank: VBLKLW

Compound	Concentration in ug/L
Methylene chloride	1 J
Toluene	0.2J
Xylene (Total)	0.7J

TIC	Retention Time
1,2,4-Trichlorobenzene	20.19
Butylated hydroxytoluene	18.68
Isopropyl benzene	16.24
1,3 Dichlorobenzene	17.77
1,4 Dichlorbenzene	17.88
1,2 Dichlorobenzene	18.31

Associated sample: N-10627, GM-34D-2, GM-34D, Rep-1, HN-28I, HN-29D, and GM-17S.

Method Blank: VBLKL5

Compound	Concentration in ug/L
Methylene chloride	2 J

TIC	Retention Time
Butylated hydroxytoluene	18.27

Associated sample: GM-21I, FW-01I, GM-15I, GM-20I, and GM-20D.

Method Blank: VBLKL9

Compound	Concentration in ug/L
Methylene chloride	1 J

TIC	Retention Time
Butylated hydroxytoluene	18.22

Associated sample: GM-13D, GM-33D-2

Three trip blanks (TB070500, TB070600, TB071000) and three field blanks (FB070500, FB070600, FB-B) were analyzed with this sample set. Additionally, one trip blank (TB071100), associated with samples in this SDG (A1379), was reported with SDG B1379, TB071100 is summarized here.

Field Blank: 070500

Compound	Concentration in ug/L
Methylene chloride	1 J
Chloroform	0.9 J

Associated samples: GM-34D2, GM-34D, N-10627, and REP-1.

Trip Blank: 070500

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.6 J

Associated samples: GM-34D2, GM-34D, N-10627, and REP-1.

Field Blank: 070600

Compound	Concentration in ug/L
Methylene chloride	1 J
Chloroform	0.9 J

Associated samples: HN-28I and HN-29D.

Trip Blank: 070600

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.5 J

Associated samples: HN-28I and HN-29D and GM-17S.

Field Blank: FB-B

Compound	Concentration in ug/L
Methylene chloride	1 J
Chloroform	0.7 J

TIC	Retention Time
Methyl-tert-butyl-ether	6.74

Associated sample: GM-17S

Trip Blank: 071000

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.6 J

Associated sample: GM-21I and FW-07.

Trip Blank: 071100

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.6 J
Trichlorethene	4 J

Associated sample: GM—13D, GM-15I, GM-20I, GM-20D, GM-33D-2.

Based on the method/ trip/ and/or field blank results the following compounds were qualified as non-detect (U).

Compound	Sample ID's
Methylene chloride	GM-13D, GM-33D-2
Xylene (total)	GM-34D-2, GM-34D, N-10627
Toluene	HN-28I
Trichlorethene	GM-15I, GM-20I
Chloroform	GM-34D

The following TIC was qualified as not usable (R) based on blank results:

TIC	Sample ID's
Butylated hydroxytoluene	N-10627, GM-21I

SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample N-10627 was used for the MS/MSD. A matrix spike blank (MSB) was also provided. Spike %R and RPD's were within control limits for the MS/MSD.

LABORATORY CONTROL SAMPLES

Laboratory control sample percent recovery criteria were not meet for the cis-1,3-dichloropropene was above limits. Based on laboratory control sample results, cis-1,3-dichloropropene was qualified as estimated (J) if detected.

INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met. 1,2,4-trichlorobenzene, isopropyl benzene, 1,2 dichlorobenzene, 1,3 dichlorobenzene, and 1,4 dichlorobenzene, were on the quantitation report for VBLKLW and methyl-tert butyl ether on the quantitation report for FB-B. These were not a target compounds and were placed on the TIC form. These compounds were not qualified with an N because a calibration was conducted for the compound.

TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds were reported correctly.

SYSTEM PERFORMANCE

The performance of the instruments during analysis is considered acceptable.

OVERALL ASSESSMENT OF DATA

One field replicate was collected with this sample set. Sample N-10627 was replicated and labeled REP-1. The replicate data was considered acceptable and qualification of the data was not necessary.

The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described in the above section.

SDG B1379

HOLDING TIMES

The samples were analyzed within New York holding time requirements.

GC/MS INSTRUMENT PERFORMANCE CHECK

The GC/MS instrument tunes were within criteria.

INITIAL CALIBRATION

One initial calibration was performed. The compounds RRFs were found to be greater than 0.05, and %RSD's were less than 30%.

CONTINUING CALIBRATION

Three continuing calibrations were performed. All compounds had RRFs >0.05. The following compounds %D were found to be >25%, for the continuing calibrations:

Instrument ID: HP5971L	Calibration Date: 07/16/00
Compound	% D
Bromomethane	31.5

Associated sample: GM-38D-2, GM-38D, TB071100, and GM-71D-2

Instrument ID: HP5971L	Calibration Date: 07/18/00 Time: 1150
Compound	% D
Bromomethane	26.3
Acetone	42.0
Carbon tetrachloride	-25.4

Associated samples: Rep-2, TB071200, GM-37D, GM-37D-2, GM-70D-2, TB071300, GM-36D, TB071400, GM-16I, and TB071700.

The compound results were qualified as estimated (J) if detected and estimated (UJ) if not detected in the associated samples.

BLANKS

Three method blanks (VBLKL5, VBLKL9, VBLKLA) were analyzed with this SDG. The following target compounds and TICs were detected in the method blanks:

Method Blank: VBLKL5

Compound	Concentration in ug/L
Methylene chloride	2 J

TIC	Retention Time
Butylated hydroxytoluene	18.27

Associated sample: GM-38D-2, GM-38D, and GM-71D-2

Method Blank: VBLKL9

Compound	Concentration in ug/L
Methylene chloride	1 J

TIC	Retention Time
Butylated hydroxytoluene	18.22

Associated sample: Rep-2, GM-70D-2, GM-16I, GM-36D, GM-37D, and GM-37D-2.

Method Blank: VBLKLA

Compound	Concentration in ug/L
Methylene chloride	1 J

TIC	Retention Time
Butylated hydroxytoluene	18.18

Associated sample: GM-36D-2, GM-18I, and GM-35D-2

Five trip blanks were analyzed along with this sample set. TB071100 was associated with samples in SDG A1379, and was summarized in that section. The following target compounds were detected in the blanks:

Trip blank (TB071200)

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.5 J

Associated sample: GM-38D-2, GM-38D, GM-71D-2, and Rep-2

Trip blank (TB071300)

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.6 J

Associated sample: GM-37D, GM-37D-2, and GM-70D-2

Trip blank (TB071400)

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.5 J

Associated sample: GM-35D-2, GM-36D, and GM-36D-2

Trip blank (TB071700)

Compound	Concentration in ug/L
Methylene chloride	2 J
Chloroform	0.8 J

Associated sample: GM-18I, GM-16I

Based on the method/ trip/ and/or field blank results the following compounds were qualified as non-detect (U).

Compound	Sample ID's
Methylene chloride	Rep-2
Chloroform	GM-71D-2, GM-37D, GM-37D-2

The following TIC was qualified as not usable (R) based on blank results:

TIC	Sample ID's
Butylated hydroxytoluene	GM-71D-2

SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample GM-38D was used for the MS/MSD/MSB. Spike percent recoveries (%R) and relative percent differences (RPD's) were within control limits for the MS/MSD. Three MSB %R exceeded control limits. Qualification of data based on MS/MSD/MSB results was not necessary.

LABORATORY CONTROL SAMPLES

Laboratory control sample percent recovery criteria were not meet for the cis-1,3-dichloropropene, acetone, 2-hexanone, 2-butanone, and trichloroethene were above limits and vinyl acetate and 1,1,2,2-tetrachloroethane were below limits. Based on laboratory control sample results, cis-1,3-dichloropropene, acetone, 2-hexanone, 2-butanone, trichloroethene, vinyl acetate, and 1,1,2,2-tetrachloroethane were qualified as estimated (J) if detected and vinyl acetate and 1,1,2,2-tetrachloroethane were qualified as not usable (R) if not detected.

INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds were reported correctly.

SYSTEM PERFORMANCE

The performance of the instruments during analysis is considered acceptable.

OVERALL ASSESSMENT OF DATA

One field replicate was collected with this sample set. Sample GM-38D-2 was replicated and labeled REP-2. The relative percent difference between the sample and the replicate was 26.6%, for trichloroethene. Therefore the sample and replicate results for trichloroethene were qualified as estimated (J).

The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described in the above section.

SDG C1379

HOLDING TIMES

The samples were analyzed within New York holding time requirements.

GC/MS INSTRUMENT PERFORMANCE CHECK

The GC/MS instrument tunes were within criteria.

INITIAL CALIBRATION

One initial calibration was performed. The compounds RRFs were found to be greater than 0.05, and %RSD's were less than 30%, except for 2-chloroethylvinylether which has a RRF less than 0.05. 2-Chloroethylvinylether was qualified as estimated (J) if detected and not usable (R) if not detected in all samples based on initial calibration results.

CONTINUING CALIBRATION

A continuing calibration was performed. The compound RRFs found to be greater than 0.05, and %D's were less than 30%, except for 2-chloroethylvinylether which has a RRF less than 0.05. 2-Chloroethylvinylether was qualified as estimated (J) if detected and not usable (R) if not detected in all samples based on continuing calibration results.

BLANKS

A method blank (VBLKMQ) was analyzed with this SDG. No target compounds or TICs were detected in the method blanks.

A trip blank and field blank were analyzed along with this sample set. Methylene chloride and chloroform were detected in both blanks. Methylene chloride was qualified as non-detect (U) in MW-3R based on blank results.

SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

MATRIX SPIKES/MATRIX SPIKE DUPLICATES

A batch specific sample was used for the MS/MSD/MSB. Spike percent recoveries (%R) and relative percent differences (RPD's) were within control limits for the MS/MSD, except for one RPD. Qualification of the data was not necessary based on MS/MSD results.

LABORATORY CONTROL SAMPLES

Laboratory control sample percent recovery criteria were not meet for the trans-1,3-dichloropropene was above limits and vinyl chloride, methylene chloride, 1,1-dichloroethene, trans-1,2-dichloroethene, cis-1,3-dichloropropene, and benzene were below limits. Based on laboratory control sample results, trans-1,3-dichloropropene, vinyl chloride, methylene chloride, 1,1-dichloroethene, trans-1,2-dichloroethene, cis-1,3-dichloropropene, and benzene were qualified as estimated (J) if detected and vinyl chloride, methylene chloride, 1,1-dichloroethene, trans-1,2-dichloroethene, cis-1,3-dichloropropene, and benzene were qualified as not usable (R) if not detected.

INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds were reported correctly.

SYSTEM PERFORMANCE

The performance of the instruments during analysis is considered acceptable.

OVERALL ASSESSMENT OF DATA

The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described in the above section.

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers A1260, A1379, and B1379.

ARCADIS Geraghty and Miller, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG A1260			
GM-14	001260A-01	06/26/00	06/27/00
GM-21S	001260A-02	06/26/00	06/27/00
N-10634	001260A-03	06/26/00	06/27/00
FB062600	001260A-04	06/26/00	06/27/00
TB062600	001260A-05	06/26/00	06/27/00
MW-16SR	001260A-06	06/27/00	06/28/00
N-10631	001260A-08	06/27/00	06/28/00
GM-18S	001260A-09	06/27/00	06/28/00
FB062700	001260A-11	06/27/00	06/28/00
TB062700	001260A-12	06/27/00	06/28/00
HW-24I	001260A-13	06/28/00	06/29/00
HW-29I	001260A-14	06/28/00	06/29/00
FW-03	001260A-15	06/28/00	06/29/00
FB062800	001260A-16	06/28/00	06/29/00
TB062800	001260A-17	06/28/00	06/29/00
SDG A1379			
GM-34D-2	01379A-01	07/05/00	07/06/00
GM-34D	01379A-02	07/05/00	07/06/00
N-10627	01379A-03	07/05/00	07/06/00
REP-1	01379A-04	07/05/00	07/06/00
FB070500	01379A-05	07/05/00	07/06/00
TB070500	01379A-06	07/05/00	07/06/00

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers A1260, A1379, and B1379.

ARCADIS Geraghty and Miller, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG A1379 continued			
HN-28I	01379A-07	07/06/00	07/07/00
HN-29D	01379A-08	07/06/00	07/07/00
GM-17S	01379A-09	07/06/00	07/07/00
FB070600	01379A-10	07/06/00	07/07/00
FB-B	01379A-11	07/06/00	07/07/00
TB070600	01379A-12	07/06/00	07/07/00
GM-21I	01379A-13	07/10/00	07/11/00
FW-01I	01379A-14	07/10/00	07/11/00
TB071000	01379A-15	07/10/00	07/11/00
GM-13D	01379A-16	07/11/00	07/12/00
GM-15I	01379A-17	07/11/00	07/12/00
GM-20I	01379A-18	07/11/00	07/12/00
GM-20D	01379A-19	07/11/00	07/12/00
GM-33D-2	01379A-20	07/11/00	07/12/00
SDG B1379			
TB071100	001379B-01	07/11/00	07/12/00
GM-38D-2	001379B-02	07/12/00	07/13/00
GM-38D	001379B-03	07/12/00	07/13/00
GM-71D-2	001379B-04	07/12/00	07/13/00
REP-2	001379B-05	07/12/00	07/13/00
TB071200	001379B-06	07/12/00	07/13/00

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers A1260, A1379, and B1379.

ARCADIS Geraghty and Miller, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG B1379 continued			
GM-37D	001379B-07	07/13/00	07/14/00
GM-37D-2	001379B-08	07/13/00	07/14/00
GM-70D-2	001379B-09	07/13/00	07/14/00
TB071300	001379B-10	07/13/00	07/14/00
GM-35D-2	001379B-11	07/14/00	07/15/00
GM-36D	001379B-12	07/14/00	07/15/00
GM-36D-2	001379B-13	07/14/00	07/15/00
TB071400	001379B-14	07/14/00	07/15/00
GM-18I	001379B-15	07/17/00	07/18/00
GM-16I	001379B-16	07/17/00	07/18/00
TB071700	001379B-17	07/17/00	07/18/00
SDG C1379			
MW-3R	001379C-01	07/31/00	08/01/00
FB 7-31-00	001379C-02	07/31/00	08/01/00
TB 7-31-00	001379C-03	07/31/00	08/01/00

ARCADIS Geraghty & Miller, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249-7600
Fax 631 249-7610

MEMO

To:
David Stern

Copies:

ENVIRONMENTAL

From:
Donna M. Brown

Date:
22 February 2001

Subject:
Data Validation of Cadmium, Chromium, and Semi-Volatile Organic Compounds for Groundwater Samples Collected from the Second Quarter 2000, Off-Site Monitoring Program, Northrop Grumman, Bethpage, New York (Project No. NY1321.1 Task 0004).

Three groundwater samples, one replicate, and one field blank were collected on September 26, 2000 in the vicinity of the Northrop Grumman site, Bethpage, New York. The samples were sent to Severn Trent Laboratories (STL) in Shelton, Connecticut for the analysis of cadmium and chromium using SW846 methods ICAP 3010A/6010B.

A groundwater sample and field blank were collected on October 2, 2000 in the vicinity of the Northrop Grumman site, Bethpage, New York. The samples were sent to Severn Trent Laboratories (STL) in Shelton, Connecticut for the analysis of semi-volatile organic compounds (SVOCs) following GC/MS using New York State Department of Environmental Conservation (NYSDEC) 10/95 Method NYDEC 95-1.

The samples were analyzed for cadmium, chromium, and SVOCs, and are included in sample delivery group (SDG) 7000-2176A. The VOC results in were fully validated and are discussed in a separate memorandum. The metal and SVOC results were reviewed for the following:

- Chain-of-custody form,
- holding times,
- method and field blanks,
- spike sample recovery,
- and field duplicates.

Our ref.:
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The data were complete and acceptable. All qualifiers added to the results are discussed below by analysis.

Chromium was detected in the preparation blank. The chromium result in GM-16S was qualified as non-detect (U) based on the blank result.

One field replicate was collected with this sample set. Sample MW-3R was replicated and labeled REP-1. Cadmium and chromium were qualified as estimated (J) in MW-3R and REP-1 based on replicate results.

Bis(2-ethylhexyl)phthalate and di-n-octylphthalate were detected in the method and field blanks. The bis(2-ethylhexyl)phthalate and di-n-octylphthalate result in GM-14 were qualified as non-detect (U) based on blank results.

Appendix F

Water Quality Letter Reports

ARCADIS GERAGHTY & MILLER

ARCADIS Geraghty & Miller Inc
88 Duryea Road
Melville, NY 11747
Tel 631 249-7600
Fax 631 249-7610

Mr. Steven Scharf, P.E.
Environmental Engineer
New York State Department of Environmental Conservation (NYSDEC)
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, New York 12233-7010

Subject:
Second Quarter 2000 Groundwater Monitoring Data,
Northrop Grumman Corporation, Bethpage, New York.

ENVIRONMENTAL

Dear Mr. Scharf:

On behalf of Northrop Grumman Corporation, ARCADIS Geraghty & Miller is providing the NYSDEC with groundwater data for the past four quarters (i.e., September and December of 1999 and March and June of 2000) of outpost monitoring near Bethpage Water District Plants 4, 5, and 6. Table 1 summarizes volatile organic compound (VOC) concentrations detected in groundwater samples. Figures 1 and 2 depict the historical concentrations of total VOCs in groundwater versus time for selected monitoring wells.

Also provided are the results of the past four quarters (i.e., September and December of 1999 and March and June of 2000) of monitoring for total cadmium and chromium (Cd/Cr). Table 2 summarizes Cd/Cr concentrations detected in groundwater samples during this period.

Please contact us if you have any questions or comments.

Date:
16 February 2001

Contact:
David E. Stern

Extension:
(631) 391-5284

Sincerely,

ARCADIS Geraghty & Miller Inc

David E. Stern
Project Scientist

Carlo San Giovanni
Project Manager

Enclosures

Copies:
J. Cofman - Northrop Grumman
J. Molloy - H2M
R. Krumholz - Bethpage Water District

Our ref.:
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Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: DATE: LAB/SAMPLER:	GM-35D2* 9/2/99 STL/G&M	GM-35D2 9/2/99 H2M/H2M	GM-35D2* 1/6/00 STL/G&M	GM-35D2 1/6/00 H2M/H2M	GM-35D2* 3/24/00 STL/G&M
Chloromethane		< 5	< 0.5	< 10	< 0.5	< 10
Bromomethane		< 5	< 0.5	< 10	< 0.5	< 10
Vinyl Choride		< 2	< 0.5	< 0.3	< 0.5	< 1
Chloroethane		< 5	< 0.5	< 10	< 0.5	< 10
Methylene chloride		< 5	< 0.5	< 10	< 0.5	< 10
Acetone		< 10 J	NA	2 J	NA	< 10
Carbon disulfide		< 10	NA	< 10	NA	< 10
1,1-Dichloroethene		4 J	5.5	5 J	6.7	4 J
1,1-Dichloroethane		1 J	0.9	< 10	0.5	< 10
1,2-Dichloroethene (total)		0.9 J	0.8	< 10	0.7	< 10
Chloroform		< 7	0.7	< 10	0.7	< 10
1,2-Dichloroethane		< 5	< 0.5	< 10	< 0.5	< 10
2-Butanone		< 10	NA	< 10	NA	< 10
1,1,1-Trichloroethane		2 J	2.6	< 10	2.4	2 J
Carbon tetrachloride		3 J	2.3	3 J	3.4	3 J
Bromodichloromethane		< 10	< 0.5	< 10	< 0.5	< 10
1,2-Dichloropropane		< 5	< 0.5	< 10	< 0.5	< 10
cis-1,3-Dichloropropene		< 5	< 0.5	< 10	< 0.5	< 10
Trichloroethene		63	80	76	94	88
Dibromochloromethane		< 5	< 0.5	< 10	< 0.5	< 10
1,1,2-Trichloroethane		< 5	< 0.5	< 10	< 0.5	< 10
Benzene		< 0.7	< 0.5	< 10	< 0.5	< 10
trans-1,3-Dichloropropene		< 5	< 0.5	< 10	< 0.5	< 10
Bromoform		< 10	< 0.5	< 10	< 0.5	< 10
4-Methyl-2-pentanone		< 10	NA	< 10	NA	< 10
2-Hexanone		< 10 J	NA	< 10	NA	< 10
Tetrachloroethene		0.5 J	0.5	< 10	< 0.5	< 10
1,1,2,2-Tetrachloroethane		< 5	< 0.5	< 10	< 0.5	< 10
Toluene		0.1 J	< 0.5	< 10	< 0.5	< 10
Chlorobenzene		< 5	< 0.5	< 10	< 0.5	< 10
Ethylbenzene		< 5	< 0.5	< 10	< 0.5	< 10
Styrene		< 5	< 0.5	< 10	< 0.5	< 10
Xylene (total)		< 5	< 0.5	< 10	< 0.5	< 10
Total VOCs		74.5	93.3	86	108.4	97

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrell, P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Laboratories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2000.
* Groundwater sample split with H2M.
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a secondary dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

	SITE:	GM-35D2	GM-35D2*	GM-35D2	GM-36D*	GM-36D
CONSTITUENT:	DATE:	3/24/00	7/14/00	7/14/00	9/2/99	9/2/99
(Units in ug/L)	LAB/SAMPLER:	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M	H2M/H2M
Chloromethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Bromomethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Vinyl Chorlde		< 0.5	< 0.3	< 0.5	< 2	< 0.5
Chloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Methylene chloride		< 0.5	< 10	< 0.5	< 5	< 0.5
Acetone		NA	< 10	NA	< 10 J	NA
Carbon disulfide		NA	< 10	NA	< 10	NA
1,1-Dichloroethene		**4**	**4** J	**4.7**	< 5	< 0.5
1,1-Dichloroethane		< 0.5	< 10	**0.6**	< 5	< 0.5
1,2-Dichloroethene (total)		< 0.5	< 10	**1.5**	**0.4** J	< 0.5
Chloroform		< 0.5	< 10	**0.7**	< 7	< 0.5
1,2-Dichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
2-Butanone		NA	< 10	NA	< 10	NA
1,1,1-Trichloroethane		**1.4**	**2** J	**1.9**	< 5	< 0.5
Carbon tetrachloride		**2**	< 10	**2.4**	< 5	< 0.5
Bromodichloromethane		< 0.5	< 10	< 0.5	< 10	< 0.5
1,2-Dichloropropane		< 0.5	< 10	< 0.5	< 5	< 0.5
cis-1,3-Dichloropropene		< 0.5	< 10	< 0.5	< 5	< 0.5
Trichloroethene		**72**	**91** J	**130**	**36**	**37**
Dibromochloromethane		< 0.5	< 10	< 0.5	< 5	< 0.5
1,1,2-Trichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Benzene		< 0.5	< 10	< 0.5	< 0.7	< 0.5
trans-1,3-Dichloropropene		< 0.5	< 10	< 0.5	< 5	< 0.5
Bromoform		< 0.5	< 10	< 0.5	< 10	< 0.5
4-Methyl-2-pentanone		NA	< 10	NA	< 10	NA
2-Hexanone		NA	< 10	NA	< 10 J	NA
Tetrachloroethene		< 0.5	< 10	**0.7**	**2** J	**1.9**
1,1,2,2-Tetrachloroethane		< 0.5	R	< 0.5	< 5	< 0.5
Toluene		< 0.5	< 10	< 0.5	< 5	< 0.5
Chlorobenzene		< 0.5	< 10	< 0.5	< 5	< 0.5
Ethylbenzene		< 0.5	< 10	< 0.5	< 5	< 0.5
Styrene		< 0.5	< 10	< 0.5	< 5	< 0.5
Xylene (total)		< 0.5	< 10	< 0.5	< 5	< 0.5
Total VOCs		**79.4**	**97**	**142.5**	**38.4**	**38.9**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

SITE:	GM-36D*		GM-36D		GM-36D*		GM-36D		GM-36D*	
CONSTITUENT: DATE:	12/10/99		12/10/99		3/27/00		3/27/00		7/14/00	
(Units in ug/L) LAB/SAMPLER:	STL/G&M		H2M/H2M		STL/G&M		H2M/H2M		STL/G&M	
Chloromethane	< 5		< 0.5		< 10		< 0.5		< 10	
Bromomethane	< 5		< 0.5		< 10		< 0.5		< 10	J
Vinyl Choride	< 2		< 0.5		< 1		< 0.5		< 0.3	
Chloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
Methylene chloride	< 5		< 0.5		< 10		< 0.5		< 10	
Acetone	< 10		NA		< 10		NA		< 10	J
Carbon disulfide	< 10		NA		< 10		NA		< 10	
1,1-Dichloroethene	< 5		< 0.5		< 10		< 0.5		< 10	
1,1-Dichloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
1,2-Dichloroethene (total)	0.6	J	< 0.5		< 10		< 0.5		< 10	
Chloroform	< 7		< 0.5		< 10		< 0.5		< 10	
1,2-Dichloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
2-Butanone	< 10		NA		< 10		NA		< 10	
1,1,1-Trichloroethane	< 5		< 0.5		< 10	J	< 0.5		< 10	
Carbon tetrachloride	< 5		< 0.5		< 10	J	< 0.5		< 10	J
Bromodichloromethane	< 10		< 0.5		< 10		< 0.5		< 10	
1,2-Dichloropropane	< 5		< 0.5		< 10		< 0.5		< 10	
cis-1,3-Dichloropropene	< 5		< 0.5		< 10		< 0.5		< 10	
Trichloroethene	52		41		54		45		24	J
Dibromochloromethane	< 5		< 0.5		< 10		< 0.5		< 10	
1,1,2-Trichloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
Benzene	< 0.7		< 0.5		< 10		< 0.5		< 10	
trans-1,3-Dichloropropene	< 5		< 0.5		< 10		< 0.5		< 10	
Bromoform	< 10		< 0.5		< 10		< 0.5		< 10	
4-Methyl-2-pentanone	< 10		NA		< 10		NA		< 10	
2-Hexanone	< 10		NA		< 10		NA		< 10	
Tetrachloroethene	3	J	1.9		2	J	1.5		< 10	
1,1,2,2-Tetrachloroethane	< 5		< 0.5		< 10		< 0.5		R	
Toluene	< 5		< 0.5		< 10		< 0.5		< 10	
Chlorobenzene	< 5		< 0.5		< 10		< 0.5		< 10	
Ethylbenzene	< 5		< 0.5		< 10		< 0.5		< 10	
Styrene	< 5		< 0.5		< 10		< 0.5		< 10	
Xylene (total)	< 5		< 0.5		< 10		< 0.5		< 10	
Total VOCs	55.6		42.9		56		46.5		24	

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

	SITE:	GM-36D	GM-36D2*	GM-36D2	GM-36D2*	GM-36D2**
CONSTITUENT:	**DATE:**	7/14/00	9/2/99	9/2/99	12/10/99	12/10/99
(Units in ug/L)	**LAB/SAMPLER:**	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M	STL/G&M
Chloromethane		< 0.5	< 5	< 0.5	< 5	< 5
Bromomethane		< 0.5	< 5	< 0.5	< 5	< 5
Vinyl Choride		< 0.5	< 2	< 0.5	< 2	< 2
Chloroethane		< 0.5	< 5	< 0.5	< 5	< 5
Methylene chloride		< 0.5	< 5	< 0.5	< 5	< 5
Acetone		NA	< 10 J	NA	< 10	< 10
Carbon disulfide		NA	< 10	NA	< 10	< 10
1,1-Dichloroethene		< 0.5	< 5	< 0.5	< 5	< 5
1,1-Dichloroethane		< 0.5	< 5	< 0.5	< 5	< 5
1,2-Dichloroethene (total)		< 0.5	< 5	< 0.5	< 5	< 5
Chloroform		< 0.5	< 7	< 0.5	< 7	< 7
1,2-Dichloroethane		< 0.5	< 5	< 0.5	< 5	< 5
2-Butanone		NA	< 10	NA	< 10	< 10
1,1,1-Trichloroethane		< 0.5	< 5	< 0.5	< 5	< 5
Carbon tetrachloride		< 0.5	< 5	< 0.5	< 5	< 5
Bromodichloromethane		< 0.5	< 10	< 0.5	< 10	< 10
1,2-Dichloropropane		< 0.5	< 5	< 0.5	< 5	< 5
cis-1,3-Dichloropropene		< 0.5	< 5	< 0.5	< 5	< 5
Trichloroethene		**22**	**0.4 J**	< 0.5	**3 J**	< 5
Dibromochloromethane		< 0.5	< 5	< 0.5	< 5	< 5
1,1,2-Trichloroethane		< 0.5	< 5	< 0.5	< 5	< 5
Benzene		< 0.5	< 0.7	< 0.5	**0.3 J**	< 0.7
trans-1,3-Dichloropropene		< 0.5	< 5	< 0.5	< 5	< 5
Bromoform		< 0.5	< 10	< 0.5	< 10	< 10
4-Methyl-2-pentanone		NA	< 10	NA	< 10	< 10
2-Hexanone		NA	< 10 J	NA	< 10	< 10
Tetrachloroethene		**0.8**	< 5	< 0.5	< 5	< 5
1,1,2,2-Tetrachloroethane		< 0.5	< 5	< 0.5	< 5	< 5
Toluene		< 0.5	< 5	< 0.5	< 5	< 5
Chlorobenzene		< 0.5	< 5	< 0.5	< 5	< 5
Ethylbenzene		< 0.5	< 5	< 0.5	< 5	< 5
Styrene		< 0.5	< 5	< 0.5	< 5	< 5
Xylene (total)		< 0.5	< 5	< 0.5	< 5	< 5
Total VOCs		**22.8**	**0.4**	**0**	**3.3**	**0**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

SITE:	GM-36D2	GM-36D2*	GM-36D2	GM-36D2*	GM-36D2
CONSTITUENT: DATE:	12/10/99	3/28/00	3/28/00	7/14/00	7/14/00
(Units in ug/L) LAB/SAMPLER:	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M	H2M/H2M
Chloromethane	< 0.5	< 10	< 1	< 10	< 0.5
Bromomethane	< 0.5	< 10	< 1	< 10	< 0.5
Vinyl Choride	< 0.5	< 1	< 1	< 0.3	< 0.5
Chloroethane	< 0.5	< 10	< 1	< 10	< 0.5
Methylene chloride	< 0.5	< 10	< 1	< 10	< 0.5
Acetone	NA	< 10	NA	< 10	NA
Carbon disulfide	NA	< 10	NA	< 10	NA
1,1-Dichloroethene	< 0.5	< 10	< 1	< 10	< 0.5
1,1-Dichloroethane	< 0.5	< 10	< 1	< 10	< 0.5
1,2-Dichloroethene (total)	< 0.5	< 10	< 1	< 10	< 0.5
Chloroform	< 0.5	< 10	< 1	< 10	< 0.5
1,2-Dichloroethane	< 0.5	< 10	< 1	< 10	< 0.5
2-Butanone	NA	< 10	NA	< 10	NA
1,1,1-Trichloroethane	< 0.5	< 10 J	< 1	< 10	< 0.5
Carbon tetrachloride	< 0.5	< 10 J	< 1	< 10	< 0.5
Bromodichloromethane	< 0.5	< 10	< 1	< 10	< 0.5
1,2-Dichloropropane	< 0.5	< 10	< 1	< 10	< 0.5
cis-1,3-Dichloropropene	< 0.5	< 10	< 1	< 10	< 0.5
Trichloroethene	< 0.5	< 10	< 1	< 10	< 0.5
Dibromochloromethane	< 0.5	< 10	< 1	< 10	< 0.5
1,1,2-Trichloroethane	< 0.5	< 10	< 1	< 10	< 0.5
Benzene	< 0.5	< 10	< 1	< 10	< 0.5
trans-1,3-Dichloropropene	< 0.5	< 10	< 1	< 10	< 0.5
Bromoform	< 0.5	< 10	< 1	< 10	< 0.5
4-Methyl-2-pentanone	NA	< 10	NA	< 10	NA
2-Hexanone	NA	< 10	NA	< 10	NA
Tetrachloroethene	< 0.5	< 10	< 1	< 10	< 0.5
1,1,2,2-Tetrachloroethane	< 0.5	< 10	< 1	R	< 0.5
Toluene	< 0.5	< 10	< 1	< 10	< 0.5
Chlorobenzene	< 0.5	< 10	< 1	< 10	< 0.5
Ethylbenzene	< 0.5	< 10	< 1	< 10	< 0.5
Styrene	< 0.5	< 10	< 1	< 10	< 0.5
Xylene (total)	< 0.5	< 10	< 1	< 10	< 0.5
Total VOCs	0	0	0	0	0

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

SITE:	GM-37D*		GM-37D		GM-37D*		GM-37D		GM-37D*	
CONSTITUENT: DATE:	9/7/99		9/7/99		1/6/00		1/6/00		3/27/00	
(Units in ug/L) LAB/SAMPLER:	STL/G&M		H2M/H2M		STL/G&M		H2M/H2M		STL/G&M	
Chloromethane	< 5		< 0.5		< 10		< 0.5		< 10	
Bromomethane	< 5		< 0.5		< 10		< 0.5		< 10	
Vinyl Choride	< 2		< 0.5		< 0.3		< 0.5		< 1	
Chloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
Methylene chloride	< 5		< 0.5		< 10		< 0.5		< 10	
Acetone	< 10		NA		< 10	J	NA		< 10	
Carbon disulfide	< 10		NA		< 10		NA		< 10	
1,1-Dichloroethene	**6**		**2.3**		**4**	**J**	**2.4**		**3**	**J**
1,1-Dichloroethane	**9**		**9.3**		**8**	**J**	**7.9**		**9**	**J**
1,2-Dichloroethene (total)	7		< 0.5		< 10		< 0.5		< 10	
Chloroform	< 7		**0.9**		< 10		**0.7**		< 10	
1,2-Dichloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
2-Butanone	< 10		NA		< 10		NA		< 10	
1,1,1-Trichloroethane	**5**		**5.3**		**4**	**J**	**4.3**		**4**	**J**
Carbon tetrachloride	< 5		< 0.5		< 10		< 0.5		< 10	J
Bromodichloromethane	< 10		< 0.5		< 10		< 0.5		< 10	
1,2-Dichloropropane	< 5		< 0.5		< 10		< 0.5		< 10	
cis-1,3-Dichloropropene	< 5		< 0.5		< 10		< 0.5		< 10	
Trichloroethene	**9**		< 0.5		**0.5**	**J**	< 0.5		< 10	
Dibromochloromethane	< 5		< 0.5		< 10		< 0.5		< 10	
1,1,2-Trichloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
Benzene	< 0.7		< 0.5		< 10		< 0.5		< 10	
trans-1,3-Dichloropropene	< 5		< 0.5		< 10		< 0.5		< 10	
Bromoform	< 10		< 0.5		< 10		< 0.5		< 10	
4-Methyl-2-pentanone	< 10		NA		< 10		NA		< 10	
2-Hexanone	< 10		NA		< 10		NA		< 10	
Tetrachloroethene	**2**	**J**	**1.5**		**1**	**J**	**1.1**		**1**	**J**
1,1,2,2-Tetrachloroethane	< 5		< 0.5		< 10		< 0.5		< 10	
Toluene	**3**	**J**	< 0.5		< 10		< 0.5		< 10	
Chlorobenzene	< 5		< 0.5		< 10		< 0.5		< 10	
Ethylbenzene	< 5		< 0.5		< 10		< 0.5		< 10	
Styrene	< 5		< 0.5		< 10		< 0.5		< 10	
Xylene (total)	< 5		< 0.5		< 10		< 0.5		< 10	
Total VOCs	**41**		**19.3**		**17.5**		**16.4**		**17**	

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected In Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

	SITE:	GM-37D	GM-37D*	GM-37D	GM-37D2*	GM-37D2
CONSTITUENT:	DATE:	3/27/00	7/13/00	7/13/00	9/7/99	9/7/99
(Units in ug/L)	LAB/SAMPLER:	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M	H2M/H2M
Chloromethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Bromomethane		< 0.5	< 10 J	< 0.5	< 5	< 0.5
Vinyl Choride		< 0.5	< 0.3	< 0.5	< 2	< 0.5
Chloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Methylene chloride		< 0.5	< 10	< 0.5	< 5	< 0.5
Acetone		NA	< 10 J	NA	< 10	NA
Carbon disulfide		NA	< 10	NA	< 10	NA
1,1-Dichloroethene		**1.7**	**4 J**	**2.5**	< 5	**0.6**
1,1-Dichloroethane		**7.8**	**9 J**	**7.4**	**7**	**6.8**
1,2-Dichloroethene (total)		< 0.5	< 10	< 0.5	< 5	< 0.5
Chloroform		0.6	< 10	**0.8**	< 7	**1.4**
1,2-Dichloroethane		< 0.5	< 10	< 0.5	< 5	**0.5**
2-Butanone		NA	< 10	NA	< 10	NA
1,1,1-Trichloroethane		**4**	**6 J**	**4.1**	< 5	**2.2**
Carbon tetrachloride		< 0.5	< 10 J	< 0.5	< 5	< 0.5
Bromodichloromethane		< 0.5	< 10	< 0.5	< 10	< 0.5
1,2-Dichloropropane		< 0.5	< 10	< 0.5	< 5	< 0.5
cis-1,3-Dichloropropene		< 0.5	< 10	< 0.5	< 5	< 0.5
Trichloroethene		< 0.5	< 10	**0.5**	**3 J**	**2.1**
Dibromochloromethane		< 0.5	< 10	< 0.5	< 5	< 0.5
1,1,2-Trichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Benzene		< 0.5	< 10	< 0.5	< 0.7	< 0.5
trans-1,3-Dichloropropene		< 0.5	< 10	< 0.5	< 5	< 0.5
Bromoform		< 0.5	< 10	< 0.5	< 10	< 0.5
4-Methyl-2-pentanone		NA	< 10	NA	< 10	NA
2-Hexanone		NA	< 10	NA	< 10	NA
Tetrachloroethene		**0.9**	**2 J**	**1.1**	< 5	< 0.5
1,1,2,2-Tetrachloroethane		< 0.5	R	< 0.5	< 5	< 0.5
Toluene		< 0.5	< 10	< 0.5	< 5	< 0.5
Chlorobenzene		< 0.5	< 10	< 0.5	< 5	< 0.5
Ethylbenzene		< 0.5	< 10	< 0.5	< 5	< 0.5
Styrene		< 0.5	< 10	< 0.5	< 5	< 0.5
Xylene (total)		< 0.5	< 10	< 0.5	< 5	< 0.5
Total VOCs		**15**	**21**	**16.4**	**10**	**13.6**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

SITE:	GM-37D2*		GM-37D2		GM-37D2*		GM-37D2		GM-37D2*	
CONSTITUENT: **DATE:**	1/7/00		1/7/00		3/27/00		3/27/00		7/13/00	
(Units in ug/L) **LAB/SAMPLER:**	STL/G&M		H2M/H2M		STL/G&M		H2M/H2M		STL/G&M	
Chloromethane	< 10		< 0.5		< 10		< 0.5		< 10	
Bromomethane	< 10		< 0.5		< 10		< 0.5		< 10	J
Vinyl Chorlde	< 0.3		**0.8**		< 1		< 0.5		< 0.3	
Chloroethane	< 10		< 0.5		< 10		< 0.5		< 10	
Methylene chloride	< 10		< 0.5		< 10		< 0.5		< 10	
Acetone	< 10	J	NA		< 10		NA		< 10	J
Carbon disulfide	< 10		NA		< 10		NA		< 10	
1,1-Dichloroethene	**2**	**J**	**1.3**		**2**	**J**	**1.3**		**4**	**J**
1,1-Dichloroethane	**9**	**J**	**8.9**		**11**		**11**		**17**	
1,2-Dichloroethene (total)	< 10		< 0.5		< 10		< 0.5		< 10	
Chloroform	< 10		**1.0**		**1**	**J**	**1**		< 10	
1,2-Dichloroethane	< 10		< 0.5		< 10		< 0.5		< 10	
2-Butanone	< 10		NA		< 10		NA		< 10	
1,1,1-Trichloroethane	**3**	**J**	**2.5**		**3**	**J**	**3**		**6**	**J**
Carbon tetrachloride	< 10		< 0.5		< 10	J	< 0.5		< 10	J
Bromodichloromethane	< 10		< 0.5		< 10		< 0.5		< 10	
1,2-Dichloropropane	< 10		< 0.5		< 10		< 0.5		< 10	
cis-1,3-Dichloropropene	< 10		< 0.5		< 10		< 0.5		< 10	
Trichloroethene	**2**	**J**	**2.3**		**2**	**J**	**2.1**		**2**	**J**
Dibromochloromethane	< 10		< 0.5		< 10		< 0.5		< 10	
1,1,2-Trichloroethane	< 10		< 0.5		< 10		< 0.5		< 10	
Benzene	< 10		< 0.5		< 10		< 0.5		< 10	
trans-1,3-Dichloropropene	< 10		< 0.5		< 10		< 0.5		< 10	
Bromoform	< 10		< 0.5		< 10		< 0.5		< 10	
4-Methyl-2-pentanone	< 10		NA		< 10		NA		< 10	
2-Hexanone	< 10		NA		< 10		NA		< 10	
Tetrachloroethene	< 10		< 0.5		< 10		< 0.5		< 10	
1,1,2,2-Tetrachloroethane	< 10		< 0.5		< 10		< 0.5		R	
Toluene	< 10		< 0.5		< 10		< 0.5		< 10	
Chlorobenzene	< 10		< 0.5		< 10		< 0.5		< 10	
Ethylbenzene	< 10		< 0.5		< 10		< 0.5		< 10	
Styrene	< 10		< 0.5		< 10		< 0.5		< 10	
Xylene (total)	< 10		< 0.5		< 10		< 0.5		< 10	
Total VOCs	**16**		**16.8**		**19**		**18.4**		**29**	

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / DATE: / LAB/SAMPLER:	GM-37D2 7/13/00 H2M/H2M	GM-38D* 9/1/99 STL/G&M	GM-38D 9/1/99 H2M/H2M	GM-38D* 12/8/99 STL/G&M	GM-38D 12/8/99 H2M/H2M
Chloromethane		< 0.5	< 25	< 1	< 50	< 1
Bromomethane		< 0.5	< 25	< 1	< 50	< 1
Vinyl Choride		< 0.5	< 10	< 1	< 20	< 1
Chloroethane		< 0.5	< 25	< 1	< 50	< 1
Methylene chloride		< 0.5	3 J	< 1	< 50	< 1
Acetone		NA	< 50 J	NA	< 100	NA
Carbon disulfide		NA	1 J	NA	< 100	NA
1,1-Dichloroethene		2.9	5 J	2.6	< 50	2
1,1-Dichloroethane		15	< 25	1.5	3 J	1
1,2-Dichloroethene (total)		< 0.5	3 J	1.3	< 50	1
Chloroform		0.8	< 35	1	< 70	< 1
1,2-Dichloroethane		< 0.5	< 25	< 1	< 50	< 1
2-Butanone		NA	< 50	NA	< 100	NA
1,1,1-Trichloroethane		4.4	4 J	3.9	4 J	3
Carbon tetrachloride		< 0.5	< 25	< 1	< 50	< 1
Bromodichloromethane		< 0.5	< 50	< 1	< 100	< 1
1,2-Dichloropropane		< 0.5	< 25	< 1	< 50	< 1
cis-1,3-Dichloropropene		< 0.5	< 25	< 1	< 50	< 1
Trichloroethene		2.3	800	610	930	700
Dibromochloromethane		< 0.5	< 25	< 1	< 50	< 1
1,1,2-Trichloroethane		< 0.5	< 25	< 1	< 50	< 1
Benzene		< 0.5	< 4	< 1	< 7	< 1
trans-1,3-Dichloropropene		< 0.5	< 25	< 1	< 50	< 1
Bromoform		< 0.5	< 50	< 1	< 100	< 1
4-Methyl-2-pentanone		NA	< 50	NA	< 100	NA
2-Hexanone		NA	< 50 J	NA	< 100	NA
Tetrachloroethene		< 0.5	< 25	1.1	< 50	1
1,1,2,2-Tetrachloroethane		< 0.5	< 25	< 1	< 50	< 1
Toluene		< 0.5	0.4 J	< 1	3 J	< 1
Chlorobenzene		< 0.5	< 25	< 1	< 50	< 1
Ethylbenzene		< 0.5	< 25	< 1	< 50	< 1
Styrene		< 0.5	< 25	< 1	< 50	< 1
Xylene (total)		< 0.5	< 25	< 1	< 50	< 1
Total VOCs		25.4	816.4	621.4	940	708

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected In Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: DATE: LAB/SAMPLER:	GM-38D* 3/28/00 STL/G&M	GM-38D 3/28/00 H2M/H2M	GM-38D* 7/12/00 STL/G&M	GM-38D 7/12/00 H2M/H2M	GM-38D2* 9/1/99 STL/G&M
Chloromethane		< 10	< 1	< 50	< 1	< 25
Bromomethane		< 10	< 1	< 50 J	< 1	< 25
Vinyl Choride		< 1	< 1	< 2	< 1	< 10
Chloroethane		< 10	< 1	< 50	< 1	< 25
Methylene chloride		< 10	< 1	< 50	< 1	2 J
Acetone		< 10	NA	< 50	NA	< 50 J
Carbon disulfide		< 10	NA	< 50	NA	< 50
1,1-Dichloroethene		6 J	3	< 50	1.7	< 25
1,1-Dichloroethane		3 J	1	< 50	1	< 25
1,2-Dichloroethene (total)		2 J	1	< 50	1	6 J
Chloroform		< 10	< 1	< 50	1	< 35
1,2-Dichloroethane		< 10	< 1	< 50	< 1	< 25
2-Butanone		< 10	NA	< 50	NA	26 J
1,1,1-Trichloroethane		5 J	4	< 50	2.6	< 25
Carbon tetrachloride		< 10 J	< 1	< 50	< 1	< 25
Bromodichloromethane		< 10	< 1	< 50	< 1	< 50
1,2-Dichloropropane		< 10	< 1	< 50	< 1	< 25
cis-1,3-Dichloropropene		< 10	< 1	< 50	< 1	< 25
Trichloroethene		1200 D	890	660 J	650	620
Dibromochloromethane		< 10	< 1	< 50	< 1	< 25
1,1,2-Trichloroethane		< 10	< 1	< 50	< 1	< 25
Benzene		< 10	< 1	< 50	< 1	< 4
trans-1,3-Dichloropropene		< 10	< 1	< 50	< 1	< 25
Bromoform		< 10	< 1	< 50	< 1	< 50
4-Methyl-2-pentanone		< 10	NA	< 50	NA	7 J
2-Hexanone		< 10	NA	< 50	NA	9 J
Tetrachloroethene		1 J	1	< 50	1	< 25
1,1,2,2-Tetrachloroethane		< 10	< 1	R	< 1	< 25
Toluene		< 10	< 1	< 50	< 1	< 25
Chlorobenzene		< 10	< 1	< 50	< 1	< 25
Ethylbenzene		< 10	< 1	< 50	< 1	< 25
Styrene		< 10	< 1	< 50	< 1	< 25
Xylene (total)		< 10	< 1	< 50	< 1	< 25
Total VOCs		1217	900	660	658.3	670

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

SITE:	GM-38D2**	GM-38D2	GM-38D2*	GM-38D2	GM-38D2*
CONSTITUENT: DATE:	9/1/99	9/1/99	12/8/99	12/8/99	3/28/00
(Units in ug/L) LAB/SAMPLER:	STL/G&M	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M
Chloromethane	< 25	< 1	< 25	< 1	< 50
Bromomethane	< 25	< 1	< 25	< 1	< 50
Vinyl Choride	< 10	< 1	< 10	< 1	< 6
Chloroethane	< 25	< 1	< 25	< 1	< 50
Methylene chloride	4 J	< 1	< 25	< 1	< 50
Acetone	< 50 J	NA	< 100	NA	14 J
Carbon disulfide	< 50	NA	< 50	NA	< 50
1,1-Dichloroethene	< 25	< 1	< 25	< 1	< 50
1,1-Dichloroethane	< 25	< 1	< 25	< 1	< 50
1,2-Dichloroethene (total)	6 J	4.6	6 J	3	< 50
Chloroform	< 35	1.3	< 35	1	< 50
1,2-Dichloroethane	< 25	< 1	< 25	< 1	< 50
2-Butanone	< 50	NA	< 100	NA	< 50
1,1,1-Trichloroethane	< 25	< 1	< 25	< 1	< 50 J
Carbon tetrachloride	< 25	< 1	< 25	< 1	< 50 J
Bromodichloromethane	< 50	< 1	< 50	< 1	< 50
1,2-Dichloropropane	< 25	< 1	< 25	< 1	< 50
cis-1,3-Dichloropropene	< 25	< 1	< 25	< 1	< 50
Trichloroethene	640	500	710	540	880
Dibromochloromethane	< 25	< 1	< 25	< 1	< 50
1,1,2-Trichloroethane	< 25	1.3	< 25	< 1	< 50
Benzene	< 4	< 1	< 4	< 1	< 50
trans-1,3-Dichloropropene	< 25	< 1	< 25	< 1	< 50
Bromoform	< 50	< 1	< 50	< 1	< 50
4-Methyl-2-pentanone	< 50	NA	< 50	NA	< 50
2-Hexanone	< 50 J	NA	< 50	NA	< 50
Tetrachloroethene	< 25	< 1	< 25	< 1	< 50
1,1,2,2-Tetrachloroethane	< 25	< 1	< 25	< 1	< 50
Toluene	0.4 J	< 1	1 J	< 1	< 50
Chlorobenzene	< 25	< 1	< 25	< 1	< 50
Ethylbenzene	< 25	< 1	< 25	< 1	< 50
Styrene	< 25	< 1	< 25	< 1	< 50
Xylene (total)	< 25	< 1	< 25	< 1	< 50
Total VOCs	650.4	507.2	717	544	894

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: DATE: LAB/SAMPLER:	GM-38D2** 3/28/00 STL/G&M	GM-38D2 3/28/00 H2M/H2M	GM-38D2* 7/12/00 STL/G&M	GM-38D2** 7/12/00 STL/G&M	GM-38D2 7/12/00 H2M/H2M
Chloromethane		< 80	< 1	< 50	< 100	< 1
Bromomethane		< 80	< 1	< 50 J	< 100 J	< 1
Vinyl Choride		< 9	< 1	< 2	< 3	< 1
Chloroethane		< 80	< 1	< 50	< 100	< 1
Methylene chloride		< 80	< 1	< 50	< 100	< 1
Acetone		< 80	NA	< 50	< 100 J	NA
Carbon disulfide		< 80	NA	< 50	< 100	NA
1,1-Dichloroethene		< 80	< 1	< 50	< 100	< 1
1,1-Dichloroethane		< 80	< 1	< 50	< 100	< 1
1,2-Dichloroethene (total)		< 80	**3.5**	**6** J	< 100	**4.6**
Chloroform		< 80	**1**	< 50	< 100	**1.3**
1,2-Dichloroethane		< 80	< 1	< 50	< 100	< 1
2-Butanone		< 80	NA	< 50	< 100	NA
1,1,1-Trichloroethane		< 80 J	< 1	< 50	< 100	< 1
Carbon tetrachloride		< 80 J	< 1	< 50	< 100 J	< 1
Bromodichloromethane		< 80	< 1	< 50	< 100	< 1
1,2-Dichloropropane		< 80	< 1	< 50	< 100	< 1
cis-1,3-Dichloropropene		< 80	< 1	< 50	< 100	< 1
Trichloroethene		**880**	**690**	**790** J	**1000** J	**730**
Dibromochloromethane		< 80	< 1	< 50	< 100	< 1
1,1,2-Trichloroethane		< 80	**1**	< 50	< 100	**1.4**
Benzene		< 80	< 1	< 50	< 100	< 1
trans-1,3-Dichloropropene		< 80	< 1	< 50	< 100	< 1
Bromoform		< 80	< 1	< 50	< 100	< 1
4-Methyl-2-pentanone		< 80	NA	< 50	< 100	NA
2-Hexanone		< 80	NA	< 50	< 100	NA
Tetrachloroethene		< 80	< 1	< 50	< 100	< 1
1,1,2,2-Tetrachloroethane		< 80	< 1	R	R	< 1
Toluene		< 80	< 1	< 50	< 100	< 1
Chlorobenzene		< 80	< 1	< 50	< 100	< 1
Ethylbenzene		< 80	< 1	< 50	< 100	< 1
Styrene		< 80	< 1	< 50	< 100	< 1
Xylene (total)		< 80	< 1	< 50	< 100	< 1
Total VOCs		**880**	**695.5**	**796**	**1000**	**737.3**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

SITE:	GM-70D2*	GM-70D2	GM-70D2*	GM-70D2	GM-70D2*
CONSTITUENT: DATE:	8/31/99	8/31/99	12/8/99	12/8/99	3/24/00
(Units in ug/L) LAB/SAMPLER:	STL/G&M	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M
Chloromethane	< 5	< 0.5	< 5	< 0.5	< 10
Bromomethane	< 5	< 0.5	< 5	< 0.5	< 10
Vinyl Choride	< 2	< 0.5	< 2	< 0.5	< 1
Chloroethane	< 5	< 0.5	< 5	< 0.5	< 10
Methylene chloride	< 5	< 0.5	< 5	< 0.5	< 10
Acetone	< 10 J	NA	< 10	NA	< 10
Carbon disulfide	< 10	NA	< 10	NA	< 10
1,1-Dichloroethene	< 5	< 0.5	< 5	< 0.5	< 10
1,1-Dichloroethane	< 5	< 0.5	< 5	< 0.5	< 10
1,2-Dichloroethene (total)	**2 J**	**0.9**	**1 J**	< 0.5	**1 J**
Chloroform	< 7	< 0.5	< 7	< 0.5	< 10
1,2-Dichloroethane	< 5	< 0.5	< 5	< 0.5	< 10
2-Butanone	< 10	NA	< 10	NA	< 10
1,1,1-Trichloroethane	< 5	< 0.5	< 5	< 0.5	< 10 J
Carbon tetrachloride	< 5	< 0.5	< 5	< 0.5	< 10 J
Bromodichloromethane	< 10	< 0.5	< 10	< 0.5	< 10
1,2-Dichloropropane	< 5	< 0.5	< 5	< 0.5	< 10
cis-1,3-Dichloropropene	< 5	< 0.5	< 5	< 0.5	< 10
Trichloroethene	**75**	**58**	**48**	**34**	**89**
Dibromochloromethane	< 5	< 0.5	< 5	< 0.5	< 10
1,1,2-Trichloroethane	< 5	< 0.5	< 5	< 0.5	< 10
Benzene	< 0.7	< 0.5	< 0.7	< 0.5	< 10
trans-1,3-Dichloropropene	< 5	< 0.5	< 5	< 0.5	< 10
Bromoform	< 10	< 0.5	< 10	< 0.5	< 10
4-Methyl-2-pentanone	< 10	NA	< 10	NA	< 10
2-Hexanone	< 10 J	NA	< 10	NA	< 10
Tetrachloroethene	**4 J**	**3.6**	**3 J**	**1.4**	**5 J**
1,1,2,2-Tetrachloroethane	< 5	< 0.5	< 5	< 0.5	< 10
Toluene	< 5	< 0.5	**0.3 J**	< 0.5	< 10
Chlorobenzene	< 5	< 0.5	< 5	< 0.5	< 10
Ethylbenzene	< 5	< 0.5	< 5	< 0.5	< 10
Styrene	< 5	< 0.5	< 5	< 0.5	< 10
Xylene (total)	< 5	< 0.5	< 5	< 0.5	< 10
Total VOCs	**81**	**62.5**	**52.3**	**35.4**	**95**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

	SITE:	GM-70D2	GM-70D2*	GM-70D2	GM-71D2*	GM-71D2
CONSTITUENT:	**DATE:**	3/24/00	7/13/00	7/13/00	8/31/99	8/31/99
(Units in ug/L)	**LAB/SAMPLER:**	H2M/H2M	STL/G&M	H2M/H2M	STL/G&M	H2M/H2M
Chloromethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Bromomethane		< 0.5	< 10 J	< 0.5	< 5	< 0.5
Vinyl Choride		< 0.5	< 0.3	< 0.5	< 2	< 0.5
Chloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Methylene chloride		< 0.5	< 10	< 0.5	< 5	< 0.5
Acetone		NA	< 10 J	NA	< 18 J	NA
Carbon disulfide		NA	< 10	NA	< 10	NA
1,1-Dichloroethene		< 0.5	< 10	< 0.5	< 5	< 0.5
1,1-Dichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
1,2-Dichloroethene (total)		**0.7**	**1 J**	< 0.5	< 5	< 0.5
Chloroform		< 0.5	< 10	< 0.5	**0.7 J**	**0.5**
1,2-Dichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
2-Butanone		NA	< 10	NA	< 10	NA
1,1,1-Trichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Carbon tetrachloride		< 0.5	< 10 J	< 0.5	**1 J**	**0.9**
Bromodichloromethane		< 0.5	< 10	< 0.5	< 10	< 0.5
1,2-Dichloropropane		< 0.5	< 10	< 0.5	< 5	< 0.5
cis-1,3-Dichloropropene		< 0.5	< 10	< 0.5	< 5	< 0.5
Trichloroethene		**99**	**54 J**	**52**	**4 J**	**2.5**
Dibromochloromethane		< 0.5	< 10	< 0.5	< 5	< 0.5
1,1,2-Trichloroethane		< 0.5	< 10	< 0.5	< 5	< 0.5
Benzene		< 0.5	< 10	< 0.5	< 0.7	< 0.5
trans-1,3-Dichloropropene		< 0.5	< 10	< 0.5	< 5	< 0.5
Bromoform		< 0.5	< 10	< 0.5	< 10	< 0.5
4-Methyl-2-pentanone		NA	< 10	NA	< 10	NA
2-Hexanone		NA	< 10	NA	< 10 J	NA
Tetrachloroethene		**4.5**	**3 J**	**2.1**	< 5	< 0.5
1,1,2,2-Tetrachloroethane		< 0.5	R	< 0.5	< 5	< 0.5
Toluene		< 0.5	< 10	< 0.5	< 5	< 0.5
Chlorobenzene		< 0.5	< 10	< 0.5	< 5	< 0.5
Ethylbenzene		< 0.5	< 10	< 0.5	< 5	< 0.5
Styrene		< 0.5	< 10	< 0.5	< 5	< 0.5
Xylene (total)		< 0.5	< 10	< 0.5	< 5	< 0.5
Total VOCs		**104.2**	**58**	**54.1**	**5.7**	**3.9**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: DATE: LAB/SAMPLER:	GM-71D2* 12/10/99 STL/G&M	GM-71D2 12/10/99 H2M/H2M	GM-71D2* 3/24/00 STL/G&M	GM-71D2 3/24/00 H2M/H2M	GM-71D2 7/12/00 STL/G&M
Chloromethane		< 5	< 0.5	< 10	< 0.5	< 10
Bromomethane		< 5	< 0.5	< 10	< 0.5	< 10 J
Vinyl Choride		< 2	< 0.5	< 1	< 0.5	< 0.3
Chloroethane		< 5	< 0.5	< 10	< 0.5	< 10
Methylene chloride		< 5	< 0.5	< 10	< 0.5	< 10
Acetone		< 10	NA	< 10	NA	< 10
Carbon disulfide		< 10	NA	< 10	NA	< 10
1,1-Dichloroethene		< 5	< 0.5	< 10	< 0.5	< 10
1,1-Dichloroethane		< 5	< 0.5	< 10	< 0.5	< 10
1,2-Dichloroethene (total)		< 5	< 0.5	< 10	< 0.5	< 10
Chloroform		**0.6 J**	< 0.5	< 10	< 0.5	< 10
1,2-Dichloroethane		< 5	< 0.5	< 10	< 0.5	< 10
2-Butanone		< 10	NA	< 10	NA	< 10
1,1,1-Trichloroethane		< 5	< 0.5	< 10 J	< 0.5	< 10
Carbon tetrachloride		**1 J**	**0.9**	**1 J**	**1.1**	**2 J**
Bromodichloromethane		< 10	< 0.5	< 10	< 0.5	< 10
1,2-Dichloropropane		< 5	< 0.5	< 10	< 0.5	< 10
cis-1,3-Dichloropropene		< 5	< 0.5	< 10	< 0.5	< 10
Trichloroethene		**4 J**	**2.5**	**5 J**	**3**	**5 J**
Dibromochloromethane		< 5	< 0.5	< 10	< 0.5	< 10
1,1,2-Trichloroethane		< 5	< 0.5	< 10	< 0.5	< 10
Benzene		< 0.7	< 0.5	< 10	< 0.5	< 10
trans-1,3-Dichloropropene		< 5	< 0.5	< 10	< 0.5	< 10
Bromoform		< 10	< 0.5	< 10	< 0.5	< 10
4-Methyl-2-pentanone		< 10	NA	< 10	NA	< 10
2-Hexanone		< 10	NA	< 10	NA	< 10
Tetrachloroethene		< 5	< 0.5	< 10	< 0.5	< 10
1,1,2,2-Tetrachloroethane		< 5	< 0.5	< 10	< 0.5	< 10
Toluene		< 5	< 0.5	< 10	< 0.5	R
Chlorobenzene		< 5	< 0.5	< 10	< 0.5	< 10
Ethylbenzene		< 5	< 0.5	< 10	< 0.5	< 10
Styrene		< 5	< 0.5	< 10	< 0.5	< 10
Xylene (total)		< 5	< 0.5	< 10	< 0.5	< 10
Total VOCs		**5.6**	**3.4**	**6**	**4.1**	**7**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 1. VOCs Detected in Groundwater Samples Collected During the Last 2 Quarters of 1999 and 1st 2 Quarters of 2000 as part of the Off-site Outpost Monitoring Program, Northrop Grumman Corporation, Bethpage, New York.

	SITE:	GM-71D2
CONSTITUENT:	**DATE:**	7/12/00
(Units in ug/L)	**LAB/SAMPLER:**	H2M/H2M
Chloromethane		< 0.5
Bromomethane		< 0.5
Vinyl Choride		< 0.5
Chloroethane		< 0.5
Methylene chloride		< 0.5
Acetone		NA
Carbon disulfide		NA
1,1-Dichloroethene		< 0.5
1,1-Dichloroethane		< 0.5
1,2-Dichloroethene (total)		< 0.5
Chloroform		**0.6**
1,2-Dichloroethane		**0.5**
2-Butanone		NA
1,1,1-Trichloroethane		< 0.5
Carbon tetrachloride		**1.7**
Bromodichloromethane		< 0.5
1,2-Dichloropropane		< 0.5
cis-1,3-Dichloropropene		< 0.5
Trichloroethene		**4.8**
Dibromochloromethane		< 0.5
1,1,2-Trichloroethane		< 0.5
Benzene		< 0.5
trans-1,3-Dichloropropene		< 0.5
Bromoform		< 0.5
4-Methyl-2-pentanone		NA
2-Hexanone		NA
Tetrachloroethene		< 0.5
1,1,2,2-Tetrachloroethane		< 0.5
Toluene		< 0.5
Chlorobenzene		< 0.5
Ethylbenzene		< 0.5
Styrene		< 0.5
Xylene (total)		< 0.5
Total VOCs		**7.6**

VOCs Volatile organic compounds.
H2M Holzmacher, McClendon & Murrel P.C., Melville, NY.
G&M ARCADIS Geraghty & Miller, Inc.
STL Severn Trent Labortories, Inc., Monroe, Connecticut. Moved to Shelton, Connecticut in February 2
* Groundwater sample split with H2I
** Replicate sample.
ug/L Micrograms per liter.
J Estimated value.
NA Not analyzed.
D Constituent identified at a second dilution.

Table 2. Total Cadmium and Chromium Detected in Groundwater Samples Collected During Last Two Quarters 1999 and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

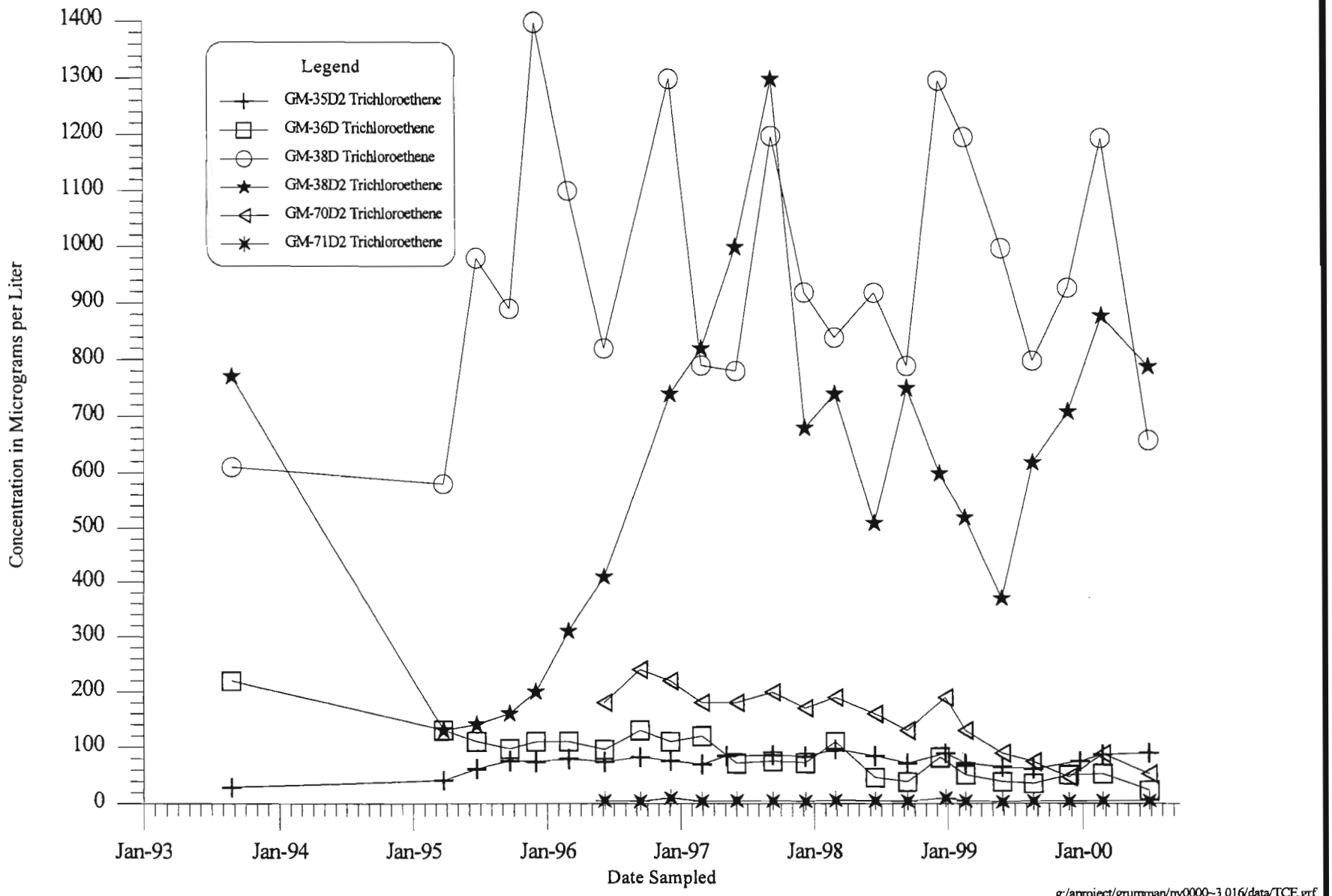
CONSTITUENT: (Units in ug/L)	NYSDEC SCGs [1]	SITE: / SAMPLE ID: / DATE:	10631 10631 9/13/99	10631 MW-10631 12/1/99	10631 N-10631 3/13/00	10631 N-10631 6/27/00	GM-16S GM-16S 3/15/00	GM-16SR MW-16SR 6/27/00
Cadmium	5		<5	**2.2 B**	**2.6**	**1.5 B**	**0.7**	<0.2
Chromium	50		**17.1**	**50.1**	**38**	**27.1**	**4.6**	<0.83

(1)	Standards, Criteria, and Guidance Values.
ug/L	Micrograms per liter.
B	Detected between the IDL and CRDL.
IDL	Instrument detection limit.
CRDL	Contract required detection limit.
NYSDEC	New York State Department of Environmental Conservation.
EQ	Equipment Blanks.
	Value exceeds associated SCG value.
*	Replicate sample.

Table 2. Total Cadmium and Chromium Detected in Groundwater Samples Collected During Last Two Quarters 1999 and First Two Quarters 2000 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC SCGs [1]	SITE: / SAMPLE ID: / DATE:	MW-03R MW-3R 9/13/99	MW-03R MW-3R 12/1/99	MW-03R MW-3R 3/13/00	MW-03R MW-3R 6/27/00	MW-03R* REP-1 6/27/00	EQ.BLANK FB062700 6/27/00
Cadmium	5		**27.6**	**26.9**	**28**	**28.9**	**29.2**	<0.2
Chromium	50		**64.6**	**67.9**	**81**	**75.8**	**75**	**1 B**

(1)	Standards, Criteria, and Guidance Values.
ug/L	Micrograms per liter.
B	Detected between the IDL and CRDL.
IDL	Instrument detection limit.
CRDL	Contract required detection limit.
NYSDEC	New York State Department of Environmental Conservation.
EQ	Equipment Blank.
	Value exceeds associated SCG value.
*	Replicate sample.



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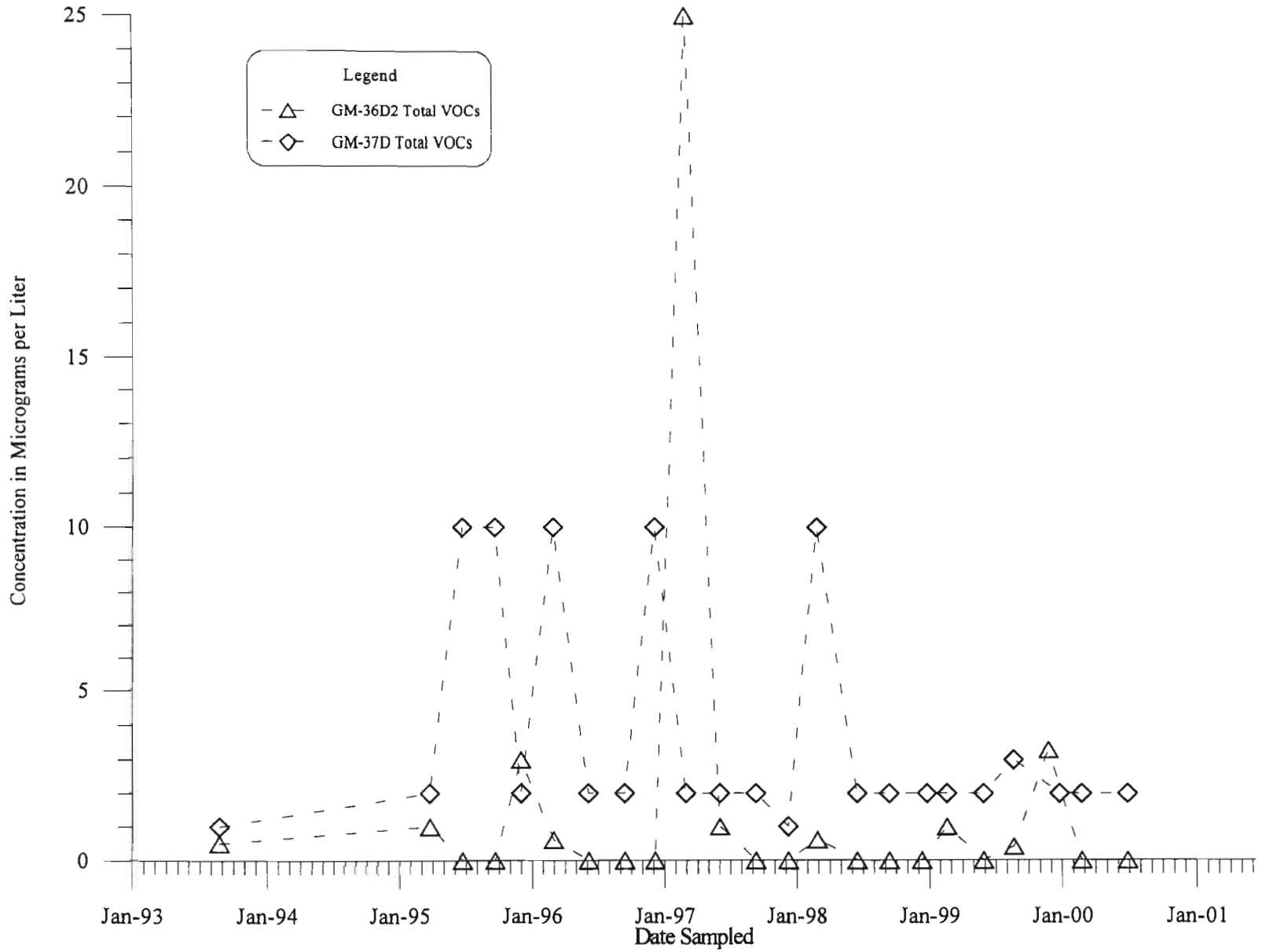
Trichloroethene Concentrations in Selected
Deep and D2 Monitoring Wells
Off-Site Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

FIGURE
1



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ARCADIS GERAGHTY & MILLER

Total Volatile Organic Compound Concentrations in
Selected Deep and D2 Monitoring Wells
Off-Site Groundwater Monitoring Program
Northrop Grumman Corporation, Bethpage, New York

FIGURE
2