ARCADIS
Infrastructure, environment, facilities

ARCADIS G&M, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610
www.arcadis-us.com

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

ENVIRONMENTAL

Subject:
June 2006 Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan, Northrop Grumman Corporation, Bethpage, New York (NYSDEC Site #1-30-003A).

Date:
June 23, 2006

Contact:
David E. Stern

Phone:
(631) 391-5284

Email:
dstern@arcadis-us.com

Our ref:
NY001348.0406.0005

Dear Mr. Scharf:

On behalf of Northrop Grumman Corporation (NGC), ARCADIS has prepared the enclosed Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan to serve as the basis of our petition to the NYSDEC to modify the groundwater sampling frequency component of the NYSDEC-approved Operable Unit 2 (OU2) Groundwater Monitoring Plan (ARCADIS Geraghty & Miller, Inc. 2001). The 2001 Plan was modified through a June 2004 petition prepared by ARCADIS (ARCADIS G&M, Inc. 2004). The NYSDEC granted approval of the June 2004 modified OU2 Groundwater Monitoring Plan later in the month of June 2004. As such, the June 2004 OU2 Groundwater Monitoring Plan has been implemented and the analytical results have been provided and evaluated in the associated quarterly/annual reports to NYSDEC and members of the Technical Advisory Committee.

Based on ongoing evaluation of the hydraulic and groundwater quality data collected as part of OU2 monitoring activities performed since Year 2004, ARCADIS recommends modification in the current monitoring frequency for selected monitoring wells. In some cases, the hydraulic and groundwater quality data support reduction in frequency of groundwater sampling or collection of hydraulic measurements; in a select few instances, the data support the discontinuation of groundwater sampling of some monitoring wells. The recommendations and technical justification are presented herein in Table 1. The site plan showing wells on and near the NGC site, including the wells referenced herein, is provided on Figure 1.

ARCADIS is submitting the enclosed information to advise NYSDEC of the recommended modifications in advance of the next quarterly groundwater monitoring round (ARCADIS will implement the enclosed modified plan during the Second Quarter 2006 Groundwater Monitoring Round). We respectfully request that NYSDEC review the enclosed petition so that any comments can be considered and incorporated, as needed, in a timely fashion.

As always, if you have any questions or comments, please feel free to contact us.

Sincerely,

ARCADIS G&M, Inc.

David E. Stern
Senior Hydrogeologist

Carlo San Giovanni
Project Manager

Enclosures

Copies:
John Cofman, Northrop Grumman
Larry Leskovjan, Northrop Grumman

Table 1. Rationale for June 2006 Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant Sites, Bethpage, New York. [1]

Well Location/Identification	Current Approved Monitoring Frequency [3]	Recommended Modified Monitoring Frequency	Rationale for Recommended Modified Monitoring Frequency
Upgradient On-Site Wells[2]			**General** **VOCs**
GM-14[4]	Semi-Annual	Discontinue	- VOC concentration trends have been established sitewide. - Active remediation of groundwater is not occurring in upgradient areas and changes in groundwater quality over time are expected to occur slowly over time.
GM-16SR	Semi-Annual	Discontinue	
GM-16I	Semi-Annual	Discontinue	**Cd/Cr** - Cd/Cr exceedences in groundwater near former NGC Plant 2 are limited to on-site areas.
GM-32S	Semi-Annual	Discontinue	- Based on analysis of Cd/Cr concentrations in groundwater near Plant 1, trends in groundwater post-remediation have been established and can be monitored on a semi-annual basis.
HN-29I	Semi-Annual	Discontinue	**Other Wells Not Listed** - All other upgradient wells will be monitored on the existing schedule, as approved by NYSDEC in June 2004.
HN-29D	Semi-Annual	Discontinue	**Specific Wells** - No detections of VOCs or SVOCs in Well GM-14 over period of record; Plant 1 Field Depot plume is stable and additional monitoring is not necessary. - No detection/trace concentration of VOCs in Wells GM-16SR, GM-16I,HN-29I, and HN-29D over the last two years. - Well GM-32S, GM-16SR, and GM-16I are located in areas where active groundwater remediation is not occurring; additional data is not necessary to monitor effectiveness of OU2 Groundwater Remedy. - Effectiveness of OU2 Groundwater Remedy can be monitored at the site boundary with wells shown on page 2.

See notes on last page.

Table 1. Rationale for June 2006 Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant Sites, Bethpage, New York. [1]

Well Location/Identification	Current Approved Monitoring Frequency [3]	Recommended Modified Monitoring Frequency	Rationale for Recommended Modified Monitoring Frequency
Site Southern Boundary On-Site Wells [2]			**General**
GM-15S	Quarterly	Semi-Annual	- Shallow zone has few detections of VOCs both on and off-site.
GM-15I	Quarterly	Semi-Annual	- Off-site Intermediate/Deep wells at site boundary are key for monitoring the performance and effectiveness of the on-site portion of the OU2 Groundwater Remedy.
GM-15D	Quarterly	Semi-Annual	
GM-15D2	Quarterly	Semi-Annual	- On-site Intermediate/Deep wells at site boundary will continue to exhibit VOC concentrations indicative of expected plume heterogeneity, therefore data produced on a reduced monitoring frequency will continue to be representative.
GM-17SR	Quarterly	Discontinue	
GM-17I	Quarterly	Semi-Annual	
GM-17D	Quarterly	Semi-Annual	- Monitoring of Cd/Cr in groundwater immediately downgradient of Plant 2 will continue on a semi-annual basis to ensure that concentrations remain in compliance with NYSDEC SCGs.
GM-18S	Quarterly	Discontinue	
GM-18I	Quarterly	Semi-Annual	- Shallow wells located to the west have exhibited no/trace concentrations of VOCs for the period of record.
GM-18D	Quarterly	Semi-Annual	
$GM\text{-}39D_A$	Quarterly	Semi-Annual	- Based on VOC concentration trends in shallow on-site groundwater, the site can be effectively monitored at the NGC site southern boundary with fewer wells.
$GM\text{-}39D_B$	Quarterly	Semi-Annual	
			Specific Wells
GM-73D	Quarterly	Semi-Annual	
GM-73D2	Quarterly	Semi-Annual	- Well GM-17SR has had no detections of VOCs over the period of record.
			- Well GM-18S is redundant to Well N-10631, based on Cd/Cr trend analysis.
GM-74I	Quarterly	Semi-Annual	- Based on location depth and trend analysis, Site boundary water qualty can be monitored with Well N-10631.
GM-74D	Quarterly	Semi-Annual	- Based on data from surrounding wellls, Well MW-3R Cd/Cr concentrations are stable and limited to on-site groundwater.
GM-74D2	Quarterly	Semi-Annual	
PLT1MW-04	Quarterly	Semi-Annual	
PLT1MW-05	Quarterly	Semi-Annual	
PLT1MW-06	Quarterly	Semi-Annual	
MW-3R	Quarterly	Discontinue	

See notes on last page.

Table 1. Rationale for June 2006 Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant Sites, Bethpage, New York. [1]

Well Location/Identification	Current Approved Monitoring Frequency [3]	Recommended Modified Monitoring Frequency	Rationale for Recommended Modified Monitoring Frequency
Site Southern Boundary [2] Off-Site Monitoring Wells			**General** Same as above
GM-21S	Quarterly	Semi-Annual	**Specific Wells** Wells GM-78S and GM-78I are key wells to monitor downgradient Cd/Cr groundwater near former Plant 2. However, these wells do not show detections of Cd/Cr over the period of record. Overall Cd/Cr concentrations remain stable and can be effectively
GM-78S	Quarterly	Semi-Annual	
GM-78I	Quarterly	Semi-Annual	**Other Wells Not Listed** - All other Site Southern Boundary/Off-Site wells will be monitored on the existing schedule, as approved by NYSDEC in June 2004.
N-10631	Quarterly	Semi-Annual	

See notes on last page.

Table 1. Rationale for June 2006 Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant Sites, Bethpage, New York. [1]

Well Location/Identification	Current Approved Monitoring Frequency [3]	Recommended Modified Monitoring Frequency	Rationale for Recommended Modified Monitoring Frequency
Downgradient (Off-Site) Wells [2]			**General**
N-10634	Semi-Annual	Discontinue	- VOC concentration trends have been established, with more than 10 years of data in many cases.
GM-36D	Semi-Annual	Annual	- Active remediation of groundwater is not currently occurring in these areas.
GM-36D2	Semi-Annual	Annual	- Changes in groundwater quality over time are expected to occur slowly.
GM-37D	Semi-Annual	Annual	- VOC concentrations over short term more indicative of plume heterogeneity.
GM-37D2	Semi-Annual	Annual	
GM-70D2	Semi-Annual	Annual	**Specific Wells**
GM-71D2	Semi-Annual	Annual	- Trends in Wells GM-36D, GM-36D2, GM-37D, GM-37D2, GM-70D2, and GM-71D2 have been established and can effectively monitor off-site plume concentrations if sampled on an annual basis.
			- Well N-10634 has had no detections over period of record. Monitoring of site-related VOCs in off-site shallow zone can be effectively achieved with Well GM-21S.
			Other Wells Not Listed - All other downgradient wells will be monitored on the existing schedule, as approved by NYSDEC in June 2004.

See notes on last page.

Table 1. Rationale for June 2006 Recommended Modifications to the Operable Unit 2 Groundwater Monitoring Plan, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant Sites, Bethpage, New York. [1]

Well Location/Identification	Current Approved Monitoring Frequency [3]	Recommended Modified Monitoring Frequency	Rationale for Recommended Modified Monitoring Frequency
Hydraulic Monitoring	Quarterly	Semi-Annual	Hydraulic data collected on a quarterly basis since November 1998 and clearly indicate that the hydraulic barrier is maintained throughout the year. Therefore it is recommended that monitoring be performed during the seasonal high/low water table (i.e., March and September). Network of wells is not proposed to change at this time.

Notes

[1] Recommended modifications will be made to the NYSDEC-approved Draft-Final OU2 Groundwater Monitoring Plan, dated May 11, 2001, updated June 3, 2004. These modifications will also be incorporated into the OU2 Operation, Maintenance, and Monitoring Plan. This plan will be implemented in the Second Quarter 2006.

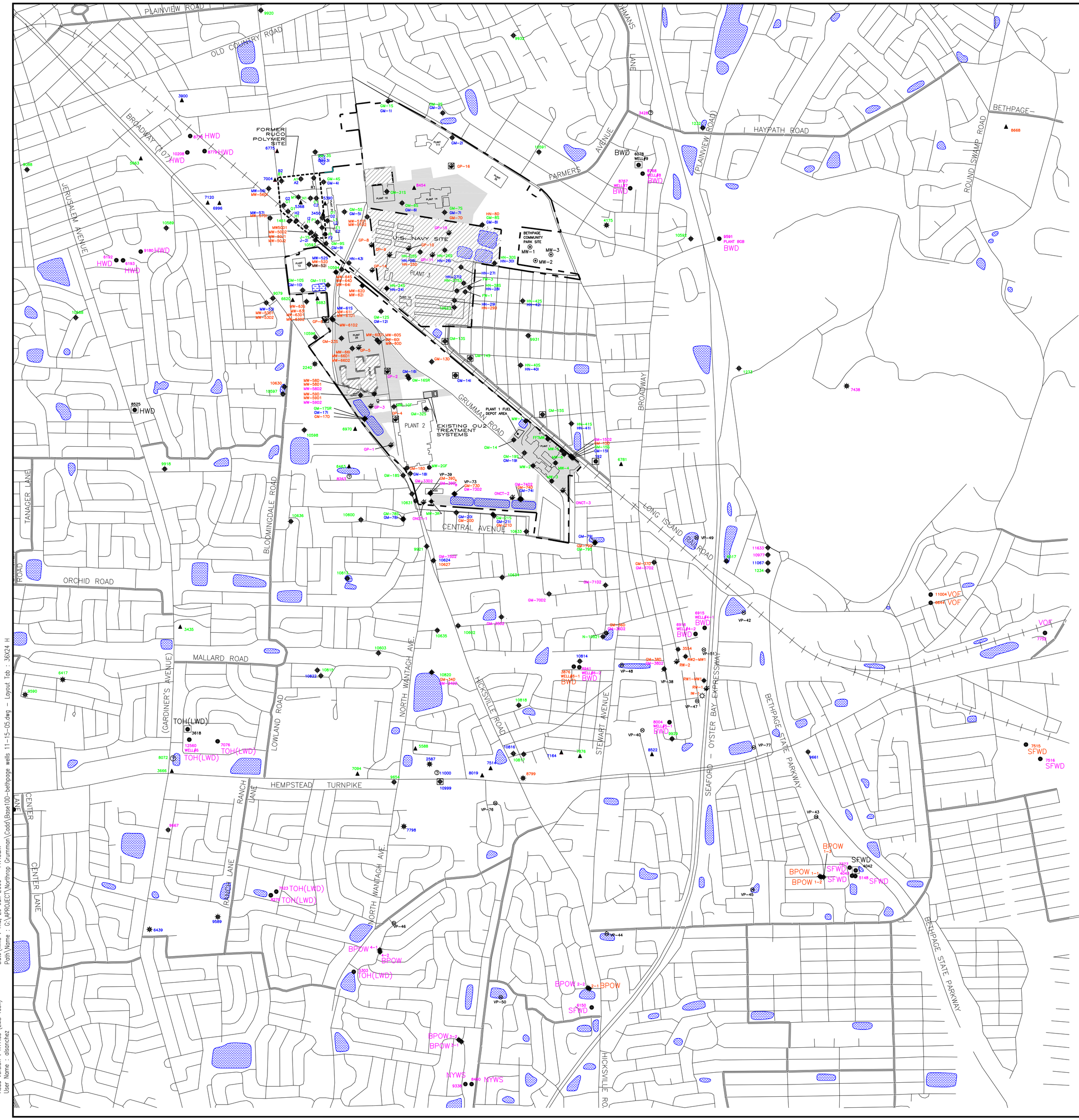
Associated changes to the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) will be made, as needed.

[2] See Figure 1 for locations of all wells on and near the Site. The term Site includes NGC and NWIRP.

[3] Monitoring frequency is given on a per calendar year basis. Semi-annual basis wells will be monitored during the spring and fall of each calendar year. Annual wells will be monitored in spring of each year.

Definitions

OU2	Operable Unit 2 for Northrop Grumman Corporation/Naval Weapons Industrial Reserve Plant Sites.
VCM	Vinyl Chloride Monomer
NYSDEC	New York State Department of Environmental Conservation
SCG	Standards, Criteria, and Guidance, as specified in the OU2 Groundwater Feasibility Study Reprot (ARCADIS, Geraghty & Miller, Inc. 2000).
PWSCP	Public Water Supply Contingency Plan
NGC	Northrop Grumman Corporation
NWIRP	Naval Weapons Industrial Reserve Plant
Cd	Cadmium
Cr	Chromium



EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER RUCO POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF U.S. NAVY SITE
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY
- DENOTES U.S. NAVY OWNED PROPERTY
- BASINS
- 6781 ▲ INDUSTRIAL WELL
- 747 ● PUBLIC SUPPLY WELL
- 9918 ◆ OBSERVATION, MONITORING WELL
- 8799 ✸ IRRIGATION WELL
- 6635 ⊘ UNKNOWN USE OF WELL
- GP-4 NORTHROP GRUMMAN OR NAVY PRODUCTION/REMEDIAL WELL OR OU2 REMEDIAL WELL
- VP-51 ⊗ EXISTING VERTICAL PROFILE BORING
- ABANDONED OR DESTROYED WELL
- MW-1 BETHPAGE PARK MONITORING WELL (APPROXIMATE)
- IW-1 INJECTION WELL

- SHALLOW WELLS
- INTERMEDIATE WELLS
- DEEP WELLS
- DEEP 2 AND DEEP 3 WELLS

SFWD	SOUTH FARMINGDALE WATER DISTRICT
LWD	LEVITTOWN WATER DISTRICT
NYWS	NEW YORK WATER SERVICE
BWD	BETHPAGE WATER DISTRICT
TOH	TOWN OF HEMPSTEAD WATER DISTRICT
HWD	HICKSVILLE WATER DISTRICT
VOF	VILLAGE OF FARMINGDALE WATER DISTRICT
VP	VERTICAL PROFILE BORING

NOTES:

1. THIS FIGURE DOES NOT INCLUDE ALL ACTIVE MONITORING AND OBSERVATION WELLS INSTALLED SINCE 1992.
2. THIS FIGURE INCLUDES ALL SHALLOW WELLS IDENTIFIED ON TABLE 1-1 OF THE OCTOBER 2000 FS REPORT PLUS SELECT ADDITIONAL MONITORING AND OBSERVATION WELLS.
3. THIS FIGURE INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION REQUESTED BY ARCADIS IN SEPTEMBER 2001 LETTER.
4. THIS FIGURE INCLUDES LOCATIONS OF VERTICAL PROFILE BORINGS INSTALLED BY THE US NAVY.
5. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HICKSVILLE, AMITYVILLE, HUNTINGTON, AND FREEPORT QUADRANGLES), AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.
6. NORTHROP GRUMMAN PROPERTY HOLDINGS BASED ON DATA PROVIDED IN SEPTERMBER 2000.
7. LOCATION OF MONITORING WELLS INSTALLED BY DVIRKA & BARTILUCCI AT PLANT 1 (i.e., MW-1 TO MW-6) ARE ESTIMATED FROM D&B SITE PLAN, PROVIDED ON DECEMBER 19, 2002.
8. THIS FIGURE INCLUDES LOCATIONS OF WELLS ASSOCIATED WITH THE GM-38 AREA REMEDIAL ACTION, PERFORMED BY THE NAVY.

0' 1000' 2000'
SCALE: 1" = 1000'

ALL COORDINATES REFERENCED TO NORTH AMERICAN DATUM 1929

REV. ISSUED DATE DESCRIPTION

KEYPLAN

PROJECT TITLE

BETHPAGE, NEW YORK
NORTHROP GRUMMAN CORPORATION

SHEET TITLE

LOCATION OF NORTHROP GRUMMAN, U.S. NAVY AND RUCO POLYMER SITES AND LOCATIONS OF WELLS

ARCADIS
88 Duryea Road
Melville, NY 11747
Tel: 631-249-7600 Fax: 631-249-7610
www.arcadis-us.com

SEAL	SEAL
PROJECT MANAGER: C. SAN GIOVANNI	DEPARTMENT MANAGER:
LEAD DESIGN PROF.:	CHECKED BY: D. STERN
TASK/PHASE NUMBER: 00001	DRAWN BY: AG
PROJECT NUMBER: NY001348	DRAWING NUMBER: 1

Date\Time : Thu, 29 Jun 2006 - 11:43am
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