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Infrastructure, environment, facilities

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ENVIRONMENT

Mr. Steven M. Scharf, P.E.
Project Engineer
New York State Department of Environmental Conservation (NYSDEC)
Division of Environmental Remediation
Remedial Action, Bureau A
625 Broadway
Albany, New York 12233-7015

Subject:
June 2009 Monthly Progress Report,
Northrop Grumman Systems Corporation,
Operable Unit 3, NYSDEC Site ID # 1-30-003A, Bethpage, New York

Date:
July 13, 2009

Contact:
David Stern

Phone:
631-391-5284

Email:
David.Stern@arcadis-us.com

Our ref:
NY001493.0909.00007

Dear Steve:

In accordance with Section III of Administrative Order on Consent (AOC) Index # W1-0018-04-01, this letter reports the activities for Operable Unit 3 (OU3) performed by Northrop Grumman Systems Corporation (Northrop Grumman) during the month of June 2009; activities planned for July 2009 are also discussed. This report is the 39th OU3 monthly progress report since the AOC between Northrop Grumman and the New York State Department of Environmental Conservation (NYSDEC) was signed on June 24, 2005.

OU3 Activities Conducted During June 2009

Activities performed this period include:

On- and Off-Site RI/FS

- Completed validation of vertical profile boring (VPB) VP-118 groundwater data. Analytical results are provided in Table 1. The VPB location is shown on Figure 1.
- Initiated drilling and sampling of VP-119
- Continued evaluation of remedial investigation (RI) data and assessment of data gaps
- Continued preparation of the Site Area Focused Feasibility Study (FFS) Report
- Prepared off-site RI Report

- Prepared and submitted addendum to OU3 RI/FS Work Plan for off-site monitoring well sampling to NYSDEC. Received NYSDEC approval.

Soil Gas IRM

- Continued Operation, Maintenance, and Monitoring (OM&M) of the Soil Gas Interim Remedial Measure (IRM);
- Completed June 2009 routine OM&M site visit
- Prepared and submitted response to NYSDOH comment letter to the NYSDEC
- Submitted March 2009 OM&M Report to NYSDEC

Groundwater IRM

- Completed validation of baseline groundwater sampling data
- Analytical results of groundwater samples collected from baseline monitoring and remedial wells are included in Tables 2 through 8. Well locations are provided on Figure 2.
- Continued preparation of OM&M Manual
- Generate remedial system punch list items
- Continued remedial system shakedown/troubleshooting.

Other

- Prepared and submitted May 2009 AOC Monthly Progress Report

OU3 Activities Expected During July 2009

On- and Off-Site RI/FS

- Continue preparation of Site Area FFS Report
- Complete drilling and sampling of VP-119.
- Continue evaluation of RI data and assessment of data gaps

- Continue to prepare off-site RI Report
- Perform off-site monitoring well sampling, as part of OU3 RI.

Soil Gas IRM

- Continue OM&M of the Soil Gas IRM

Groundwater IRM

- Work on remedial system punch list items
- Continue preparation of OM&M Manual
- Complete shakedown/troubleshooting and initiate continuous operation.

Other

- Prepare and submit June 2009 AOC Monthly Progress Report.

Feel free to call us if you have any questions.

Sincerely,

ARCADIS

David E. Stern
Senior Scientist /Associate Project Manager

Copies:
C. San Giovanni, ARCADIS
M. Wolfert, ARCADIS
File, ARCADIS
J. Cofman, Northrop Grumman
K. Smith, Northrop Grumman
Bethpage Public Library – Public Repository

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Boring VP-118, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: VP-118 Sample Depth (ft bls): 4/9/2009 Sample Date: 54	VP-118 4/9/2009 104	VP-118 4/10/2009 154	VP-118 4/13/2009 209	VP-118 4/13/2009 259	VP-118 4/14/2009 314	VP-118 4/15/2009 339	VP-118 4/15/2009 359	VP-118 4/15/2009 384
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	**0.4 J**	< 5	**1.2 J**	**0.93 J**
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.32 J**	**0.4 J**
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	**0.72 J**	< 5	**1 J**	**1.6 J**
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	<50 B	<50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.63 J**
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.56 J**	**0.55 J**
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	**0.38 J**	< 5	< 5	< 5	< 5	< 5	< 5	**0.43 J**	**0.41 J**
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	< 5	< 5	< 5	< 5	< 5	**0.81 J**	**0.38 J**	**1 J**	**1.7 J**
cis-1,3-Dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	**0.94 J**	< 5	**0.88 J**	**0.92 J**
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	**2.2 J**	**2.6 J**	< 5	< 5	**1 J**
Toluene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichlroroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trans-1,3-Dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethene	< 5	< 5	< 5 B	< 5	**34**	**79**	< 5 B	**62**	**130**
Trichlorotrifluoroethane (Freon 113)	< 5	< 5	< 5	< 5	**0.49 J**	**3.9 J**	**1.2 J**	**5.8**	**7.9**
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene- O	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylene- M &P	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**0.38**	**0**	**0**	**0**	**36.69**	**88.3**	**1.58**	**73.19**	**146.04**

see footnotes on last page

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Boring VP-118, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: VP-118 Sample Depth (ft bls): 4/16/2009 Sample Date: 409	VP-118 4/16/2009 429	VP-118 4/17/2009 454	VP-118 4/20/2009 494	VP-118 4/22/2009 514	VP-118 4/22/2009 534	VP-118 4/23/2009 574	VP-118 4/24/2009 614
1,1,1-Trichloroethane	**1.1 J**	**0.79 J**	**0.92 J**	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	**0.41 J**	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	**1.7 J**	**1.3 J**	**1.9 J**	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	**1.3 J**
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	< 50 B	< 50 B	< 50 B	< 50 B	< 50	**3.7**	< 50 B	< 50 B
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	B	< 5	< 5	< 5	< 5	**0.31 J**
Carbon Tetrachloride	< 5	< 5	**0.45 J**	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	**0.54 J**	**0.54 J**	**0.78 J**	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	**0.5 J**	**0.42 J**	**0.66 J**	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0.45 J**
cis-1,2-Dichloroethene	**0.62 J**	**0.69 J**	**1.8 J**	< 5	< 5	< 5	**0.41 J**	< 5
cis-1,3-Dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	**1.3 J**	**1.3 J**	**0.93 J**	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	< 5	< 5	< 5	< 5 B	**1.1**	**0.79**	< 5 B	< 5 B
trans-1,2-Dichlroroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trans-1,3-Dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethene	**15**	< 5 B	**89**	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	**7.1**	**5.6**	**8.4**	< 5	**0.76**	**0.76**	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene- O	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylene- M &P	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**27.86**	**10.64**	**105.25**	**0**	**1.86**	**5.25**	**0.41**	**2.06**

see footnotes on last page

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Boring VP-118, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: VP-118 Sample Depth (ft bls): 4/24/2009 Sample Date: 619	VP-118 4/27/2009 639	VP-118 4/27/2009 659	VP-118 4/28/2009 679	VP-118 4/28/2009 699	VP-118 4/29/2009 729	VP-118 5/4/2009 769	VP-118 5/5/2009 794
1,1,1-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-pentanone	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B	< 50 B
Benzene	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	< 5	**0.34 J**	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	< 5 B	< 5	**0.39 J**	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichlroroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trans-1,3-Dichloropropene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethene	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	< 5	**0.48 J**	< 5	< 5	**0.46 J**	< 5	< 5	< 5
Vinyl Chloride	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene- O	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylene- M &P	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOCs	**0**	**0.82**	**0.39**	**0**	**0.46**	**0**	**0**	**0**

see footnotes on last page

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Vertical Profile Boring VP-118, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the TCL VOCs using NYSDEC ASP 2000 Method OLM4.2.

Bold value indicates a detection

RI/FS	Remedial Investigation/Feasibility Study
TCL	Target compound list
VOC	Volatile organic compound
ASP	Analytical services protocol
ft bls	Feet below land surface
ug/L	Micrograms per liter
TVOC	Total volatile organic compounds
J	Value is estimated
B	Constituent detected in associated blank

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Table 2. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from the Groundwater IRM Recovery Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	RW-01 4/21/2009	RW-02 4/21/2009	RW-03 4/22/2009	RW-04 4/22/2009
1,1,1-Trichloroethane		< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane		< 5	< 5	< 5	< 5
1,1,2-Trichloroethane		< 5	< 5	< 5	< 5
1,1-Dichloroethane		< 5	< 5	**3**	**0.38**
1,1-Dichloroethene		< 5	< 5	**0.39**	< 5
1,2-Dichloroethane		< 5	< 5	< 5	< 5
1,2-Dichloropropane		< 5	< 5	< 5	< 5
2-Butanone		< 50	< 50	< 50	< 50
2-Hexanone		< 50	< 50	< 50	< 50
4-methyl-2-pentanone		< 50	< 50	< 50	< 50
Acetone		< 50	< 50 B	< 50 B	< 50
Benzene		< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane		< 5	< 5	< 5	< 5
Bromoform		< 5	< 5	< 5	< 5
Bromomethane		< 5	< 5	< 5	< 5
Carbon Disulfide		< 5	< 5	< 5	< 5
Carbon tetrachloride		< 5	< 5	< 5	< 5
Chlorobenzene		< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)		< 5	**0.46 J**	**0.43**	**10**
Chloroethane		< 5	< 5	< 5	< 5
Chloroform		**4.7 J**	**9.3**	**0.87**	**0.98**
Chloromethane		< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		< 5 B	< 5 B	**350**	< 5 B
cis-1,3-dichloropropene		< 5	< 5	< 5	< 5
Dibromochloromethane		< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		< 5	< 5	< 5	< 5
Ethylbenzene		< 5	< 5	< 5	< 5
Methylene Chloride		< 5	< 5	< 5	< 5
Styrene		< 5	< 5	< 5	< 5
Tetrachloroethene		< 5	< 5	**0.85**	**0.37**
Toluene		< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		< 5	< 5	**1.2**	< 5
trans-1,3-dichloropropene		< 5 J	< 5	< 5	< 5
Trichloroethylene		**1.1 J**	**1.4 J**	**43**	**0.73**
Trichlorotrifluoroethane (Freon 113)		< 5	< 5	< 5	< 5
Vinyl Chloride		< 2	< 2	< 2	< 2
Xylene-o		< 5	< 5	< 5	< 5
Xylenes - m,p		< 5	< 5	< 5	< 5
TVOC		**5.8**	**11.16**	**399.74**	**12.46**

Notes and Abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from the Groundwater IRM Recovery Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the TCL VOCs using NYSDEC ASP Method 2000 OLM4.2.

Bold value indicates a detection

IRM	Interim Remedial Measure
RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TCL	Total compound list
VOC	Volatile organic Compound
ASP	Analytical services protocol
ug/L	Micrograms per liter
TVOC	Total volatile organic compounds
J	Value is estimated
B	Constituent detected in associated blank

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Table 3. Concentrations of Metals in Groundwater Samples Collected from the Groundwater IRM Recovery Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Sample Location:	RW-01	RW-01	RW-02	RW-02	RW-03	RW-03	RW-04	RW-04
Sample Date:	4/21/2009	4/21/2009	4/21/2009	4/21/2009	4/22/2009	4/22/2009	4/22/2009	4/22/2009
CONSTITUENT (ug/L) Fraction:	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Metals								
Cadmium	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium	**24.3**	**20.2**	< 10	< 10	**22.6**	< 10	< 10	< 10
Iron	< 100	< 100	**2330**	**781**	**246**	< 100	< 100	< 100
Manganese	**23.6**	**22.4**	**241**	**248**	< 10	< 10	**10.4**	< 10
Mercury	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the metals using NYSDEC ASP Method 2000 ILM4.0.

Bold value indicates a detection

IRM Interim Remedial Measure
RI/FS Remedial Investigation/Feasibility Study
NYSDEC New York State Department of Environmental Conservation
TAL Target analyte list
ASP Analytical services protocol
ug/L Micrograms per liter

Table 4. Concentrations of TDS and TSS in the Groundwater IRM Recovery Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	RW-01 4/22/2009	RW-02 4/22/2009	RW-03 4/22/2009	RW-04 4/22/2009
TDS		**195**	**372**	**474**	**284**
TSS		< 1	**54.8**	< 1.2	< 1

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for TDS using USEPA Method 160.1 and TSS using USEPA Method 160.2.

Bold value indicates a detection

IRM	Interim Remedial Measure
RI/FS	Remedial Investigation/Feasbility Study
USEPA	United States Environmental Protection Agency
ug/L	Micrograms per liter
TDS	Total dissolved solids
TSS	Total suspended solids

Table 5. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	B24MW-2 4/23/2009	B24MW-3 4/20/2009	B30MW-1 4/23/2009	BCPMW-1 4/28/2009	BCPMW-2 4/28/2009	BCPMW-3 4/29/2009	BCPMW-4-1 4/17/2009	BCPMW-4-2 4/17/2009
1,1,1-Trichloroethane		< 5	**0.62 J**	< 5	< 5	< 10	< 25	< 25	< 250
1,1,2,2-Tetrachloroethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
1,1,2-Trichloroethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
1,1-Dichloroethane		< 5	< 5	< 5	**0.37 J**	**8 J**	**9.6 J**	**6.5 J**	**57 J**
1,1-Dichloroethene		< 5	< 5	< 5	< 5	**3.8 J**	**43**	**1.8 J**	**34 J**
1,2-Dichloroethane		< 5	< 5	< 5	< 5	**0.68 J**	< 25	< 25	< 250
1,2-Dichloropropane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
2-Butanone		< 50	< 50	< 50	< 50	< 100	< 250	< 250	< 2500
2-Hexanone		< 50	< 50 J	< 50	< 50	< 100	< 250	< 250 J	< 2500 J
4-methyl-2-pentanone		< 50	< 50 J	< 50	< 50	< 100	< 250	< 250 J	< 2500 J
Acetone		< 50 B	< 50	< 50 B	< 50 B	< 100	< 250	< 250 J	< 2500 J
Benzene		< 0.7	< 0.7	< 0.7	< 0.7	< 1.4	< 3.5	< 3.5	< 35
Bromodichloromethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Bromoform		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Bromomethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Carbon Disulfide		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Carbon tetrachloride		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Chlorobenzene		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Chlorodifluoromethane (Freon 22)		< 5	< 5	< 5	< 5	< 10	< 25	**17 J**	< 250
Chloroethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Chloroform		< 5	< 5	< 5	**0.88 J**	< 10	< 25	< 25	< 250
Chloromethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
cis-1,2-dichloroethene		< 5	**10**	< 5	**22**	**310**	**900**	**1800 D**	**18000 D**
cis-1,3-dichloropropene		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Dibromochloromethane		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Dichlorodifluoromethane (Freon 12)		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Ethylbenzene		< 5	< 5	< 5	< 5	< 10	< 25 B	< 25	**62 J**
Methylene Chloride		< 5	< 5	< 5	**0.52 J**	< 10	< 25	< 25	< 250
Styrene		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Tetrachloroethene		< 5	**0.51 J**	< 5	< 5	**1.5 J**	< 25	< 25	< 250
Toluene		< 5	< 5	< 5	**0.33 J**	< 10	< 25 B	< 25	**2400**
trans-1,2-dichloroethene		< 5	< 5	< 5	**0.44 J**	**2.4 J**	**8.9 J**	**110**	< 250
trans-1,3-dichloropropene		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Trichloroethylene		**3.7 J**	**45**	< 5	**190**	**180**	**470**	**22 J**	< 250
Trichlorotrifluoroethane (Freon 113)		< 5	< 5	< 5	< 5	< 10	< 25	< 25	< 250
Vinyl Chloride		< 2	< 2	< 2	< 2	**4.1**	**300**	**180**	**6300**
Xylene-o		< 5	< 5	< 5	< 5	< 10	< 25 B	< 25	**110 J**
Xylenes - m,p		< 5	< 5	< 5	< 5	< 10	< 25 B	< 25	**190 J**
TVOC		**3.7**	**56.13**	0	**214.54**	**510.48**	**1,731.5**	**2,137.3**	**27,153**

Notes and Abbreviations on last page.

Table 5. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	BCPMW-4-3 4/17/2009	BCPMW-5-1 4/23/2009	BCPMW-6-1 4/20/2009	BCPMW-6-2 5/8/2009	BCPMW-7-1 4/20/2009	MW-200-1 4/29/2009	MW-201-1 5/1/2009
1,1,1-Trichloroethane		< 5	< 100	< 5	< 5	< 5	< 5	**5.5 J**
1,1,2,2-Tetrachloroethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
1,1,2-Trichloroethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
1,1-Dichloroethane		< 5	< 100	**0.3 J**	**0.37 J**	< 5	**0.79 J**	**10 J**
1,1-Dichloroethene		< 5	**21 J**	< 5	< 5	< 5	< 5	**7.9 J**
1,2-Dichloroethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
1,2-Dichloropropane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
2-Butanone		< 50	< 1000	< 50	< 50	< 50	< 50	< 250
2-Hexanone		< 50 J	< 1000	< 50 J	< 50	< 50 J	< 50	< 250
4-methyl-2-pentanone		< 50 J	< 1000	< 50 J	< 50	< 50 J	< 50	< 250
Acetone		< 50 J	< 1000	< 50 J	< 50	< 50	< 50 B	< 250 B
Benzene		< 0.7	< 14	< 0.7	< 0.7	< 0.7	< 0.7	< 3.5
Bromodichloromethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Bromoform		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Bromomethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Carbon Disulfide		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Carbon tetrachloride		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Chlorobenzene		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Chlorodifluoromethane (Freon 22)		< 5	< 100	**4500 D**	< 5	**2.6 J**	< 5	< 25
Chloroethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Chloroform		**0.53 J**	< 100	**1.7 J**	**0.53 J**	< 5	**2.3 J**	< 25
Chloromethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
cis-1,2-dichloroethene		**0.37 J**	**960**	**21**	< 5	< 5	**38**	**970 D**
cis-1,3-dichloropropene		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Dibromochloromethane		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Dichlorodifluoromethane (Freon 12)		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Ethylbenzene		< 5	**48 J**	< 5	< 5	< 5	< 5	< 25
Methylene Chloride		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Styrene		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Tetrachloroethene		< 5	< 100	**0.34 J**	< 5	< 5	**0.54 J**	< 25
Toluene		< 5	**2700**	< 5	< 5	< 5	< 5	< 25
trans-1,2-dichloroethene		< 5	< 100	< 5	< 5	< 5	**0.3 J**	**2.7 J**
trans-1,3-dichloropropene		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Trichloroethylene		**0.56 J**	**220**	**4.9 J**	< 5	< 5	**34**	**160**
Trichlorotrifluoroethane (Freon 113)		< 5	< 100	< 5	< 5	< 5	< 5	< 25
Vinyl Chloride		< 2	**330**	< 2	< 2	< 2	< 2	< 10
Xylene-o		< 5	**40 J**	< 5	< 5	< 5	< 5	< 25
Xylenes - m,p		< 5	**110**	< 5	< 5	< 5	< 5	< 25
TVOC		**1.46**	**4,429**	**4,528.24**	**0.9**	**2.6**	**75.93**	**1,156.10**

Notes and Abbreviations on last page.

Table 5. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	MW-202-1 5/1/2009	MW-203-1 5/1/2009
1,1,1-Trichloroethane		< 5	< 5
1,1,2,2-Tetrachloroethane		< 5	< 5
1,1,2-Trichloroethane		< 5	< 5
1,1-Dichloroethane		< 5	< 5
1,1-Dichloroethene		< 5	< 5
1,2-Dichloroethane		< 5	< 5
1,2-Dichloropropane		< 5	< 5
2-Butanone		< 50	< 50
2-Hexanone		< 50	< 50
4-methyl-2-pentanone		< 50	< 50
Acetone		< 50	< 50 B
Benzene		< 0.7	< 0.7
Bromodichloromethane		< 5	< 5
Bromoform		< 5	< 5
Bromomethane		< 5	< 5
Carbon Disulfide		< 5	< 5
Carbon tetrachloride		< 5	< 5
Chlorobenzene		< 5	< 5
Chlorodifluoromethane (Freon 22)		< 5	**73**
Chloroethane		< 5	< 5
Chloroform		**6.2**	**7.9**
Chloromethane		< 5	< 5
cis-1,2-dichloroethene		**0.64 J**	**1.6 J**
cis-1,3-dichloropropene		< 5	< 5
Dibromochloromethane		< 5	< 5
Dichlorodifluoromethane (Freon 12)		< 5	< 5
Ethylbenzene		< 5	< 5
Methylene Chloride		< 5	< 5
Styrene		< 5	< 5
Tetrachloroethene		< 5	< 5
Toluene		< 5	< 5
trans-1,2-dichloroethene		< 5	< 5
trans-1,3-dichloropropene		< 5	< 5
Trichloroethylene		**7.5**	**1.3 J**
Trichlorotrifluoroethane (Freon 113)		< 5	< 5
Vinyl Chloride		< 2	< 2
Xylene-o		< 5	< 5
Xylenes - m,p		< 5	< 5
TVOC		**14.34**	**83.8**

Notes and Abbreviations on last page.

Table 5. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the TCL VOCs using NYSDEC ASP Method 2000 OLM4.2.

Bold value indicates a detection

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TCL	Total compound list
VOC	Volatile organic Compound
ASP	Analytical services protocol
ug/L	Micrograms per liter
TVOC	Total volatile organic compounds
J	Value is estimated
D	Value is from secondary dilution
B	Constituent detected in associated blank

Table 6. Concentrations of Metals in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Sample Location:	B24MW-2	B24MW-2	B24MW-3	B24MW-3	BCPMW-1	BCPMW-1	BCPMW-2	BCPMW-2	BCPMW-3	BCPMW-3	BCPMW-4-1	BCPMW-4-1
Sample Date:	4/23/2009	4/23/2009	4/20/2009	4/20/2009	4/28/2009	4/28/2009	4/28/2009	4/28/2009	4/29/2009	4/29/2009	4/17/2009	4/17/2009
CONSTITUENT Fraction:	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
(ug/L)												
Metals												
Cadmium	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium	**40.3**	< 10	**28.2**	**10.6**	**20.8**	< 10	< 10	< 10	< 10	< 10	**22.7**	**12.8**
Iron	--	--	**597**	< 100	--	--	< 100	< 100	**2080**	**1760**	**103**	< 100
Manganese	--	--	**16.9**	**13.7**	--	--	**12.7**	**11.3**	**51.4**	**49.2**	**11.2**	< 10

Notes and Abbreviations on last page.

Table 6. Concentrations of Metals in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Sample Location:	BCPMW-4-2	BCPMW-4-2	BCPMW-4-3	BCPMW-4-3	BCPMW-5-1	BCPMW-5-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-2	BCPMW-6-2	BCPMW-7-1	BCPMW-7-1
Sample Date:	4/17/2009	4/17/2009	4/17/2009	4/17/2009	4/23/2009	4/23/2009	4/20/2009	4/20/2009	5/8/2009	5/8/2009	4/20/2009	4/20/2009
CONSTITUENT (ug/L) Fraction:	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Metals												
Cadmium	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium	**10.6**	< 10	< 10	< 10	< 10	< 10	< 10	< 10	**10.3**	< 10	< 10	< 10
Iron	**4630**	**4080**	< 100	< 100	**7420**	**6370**	< 100	< 100	--	--	< 100	< 100
Manganese	**228**	**217**	< 10	< 10	**145**	**131**	< 10	< 10	--	--	**106**	**94.8**

Notes and Abbreviations on last page.

Table 6. Concentrations of Metals in Groundwater Samples Collected from Site Area Monitoring Wells, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date: / Fraction:	MW-200-1 4/29/2009 Total	MW-200-1 4/29/2009 Dissolved	MW-201-1 5/1/2009 Total	MW-201-1 5/1/2009 Dissolved	MW-202-1 5/1/2009 Total	MW-202-1 5/1/2009 Dissolved	MW-203-1 5/1/2009 Total	MW-203-1 5/1/2009 Dissolved
Metals									
Cadmium		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium		< 10	< 10	< 10	< 10	**16.5**	< 10	**31.5**	< 10
Iron		--	--	--	--	--	--	--	--
Manganese		--	--	--	--	--	--	--	--

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the metals using NYSDEC ASP Method 2000 ILM4.0.

Bold value indicates a detection

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
ASP	Analytical services protocol
ft bls	Feet below land surface
ug/L	Micrograms per liter
--	Not analyzed

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Table 7. Concentrations of Volatile Organic Compounds in Perched Water Samples Collected from Site Area Perched Water Piezometers, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	F-8-PZ 4/28/2009	H-3-PZ 4/24/2009	H-7-PZ 4/23/2009
1,1,1-Trichloroethane		< 5	**2.3 J**	< 5
1,1,2,2-Tetrachloroethane		< 5	< 5	< 5
1,1,2-Trichloroethane		< 5	**1.4 J**	< 5
1,1-Dichloroethane		< 5	**54**	< 5
1,1-Dichloroethene		< 5	< 5	< 5
1,2,4,Trichlorobenzene		--	--	< 5
1,2-Dibromo-3-Chloropropane (DBCP)		--	--	< 5
1,2-Dibromoethane (EDB)		--	--	< 5
1,2-Dichlorobenzene		--	--	< 5
1,2-Dichloroethane		< 5	**1.5 J**	< 5
1,2-Dichloropropane		< 5	**5 J**	< 5
1,4-Dichlorobenzene		--	--	< 5
2-Butanone		< 50	< 50	< 50
2-Hexanone		< 50	< 50	< 50
4-methyl-2-pentanone		< 50	< 50	< 50
Acetone		< 50 B	< 50 B	< 50 B
Benzene		< 0.7	< 0.7	< 0.7
Bromodichloromethane		< 5	< 5	< 5
Bromoform		< 5	< 5	< 5
Bromomethane		< 5	< 5	< 5
Carbon Disulfide		< 5	< 5	< 5
Carbon tetrachloride		< 5	< 5	< 5
Chlorobenzene		< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)		< 5	< 5	--
Chloroethane		< 5	< 5	< 5
Chloroform		< 5	< 5	< 5
Chloromethane		< 5	< 5	< 5
cis-1,2-dichloroethene		< 5	< 5 B	**28**
cis-1,3-dichloropropene		< 5	< 5	< 5
Cyclohexane				< 5
Dibromochloromethane		< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		< 5	< 5	< 5
Ethylbenzene		< 5	< 5	< 5
Isopropylbenzene		--	--	< 5
m-Dichlorobenzene (1,3-Dichlorobenzene)		--	--	< 5
Methyl Acetate		--	--	< 5
Methyl tert-Butyl Ether		--	--	< 5
Methylcylohexane		--	--	< 5
Methylene Chloride		< 5	< 5	< 5
Styrene		< 5	< 5	< 5
Tetrachloroethene		< 5	< 5	**0.41 J**
Toluene		< 5	< 5 B	< 5
trans-1,2-dichloroethene		< 5	< 5	< 5
trans-1,3-dichloropropene		< 5	< 5	< 5

Notes and Abbreviations on last page.

Table 7. Concentrations of Volatile Organic Compounds in Perched Water Samples Collected from Site Area Perched Water Piezometers, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Sample Date:	F-8-PZ 4/28/2009	H-3-PZ 4/24/2009	H-7-PZ 4/23/2009
Trichloroethylene		< 5	**0.73 J**	**8.6**
Trichlorofluoromethane (CFC-11)		--	--	< 5
Trichlorotrifluoroethane (Freon 113)		< 5	< 5	< 5
Vinyl Chloride		< 2	< 2	**26**
Xylene-o		< 5	< 5	< 5
Xylenes - m,p		< 5	< 5	< 5
TVOC		0	**64.93**	**63.01**

Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the TCL VOCs using NYSDEC ASP Method 2000 OLM4.2.
3. Piezometer I-4-PZ not sampled this event.

Bold value indicates a detection

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TCL	Total compound list
VOC	Volatile organic Compound
ASP	Analytical services protocol
ug/L	Micrograms per liter
TVOC	Total volatile organic compounds
J	Value is estimated
B	Detected in an associated blank
--	Not analyzed

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Table 8. Concentrations of Metals in Perched Water Samples Collected from Site Area Perched Water Piezometers, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

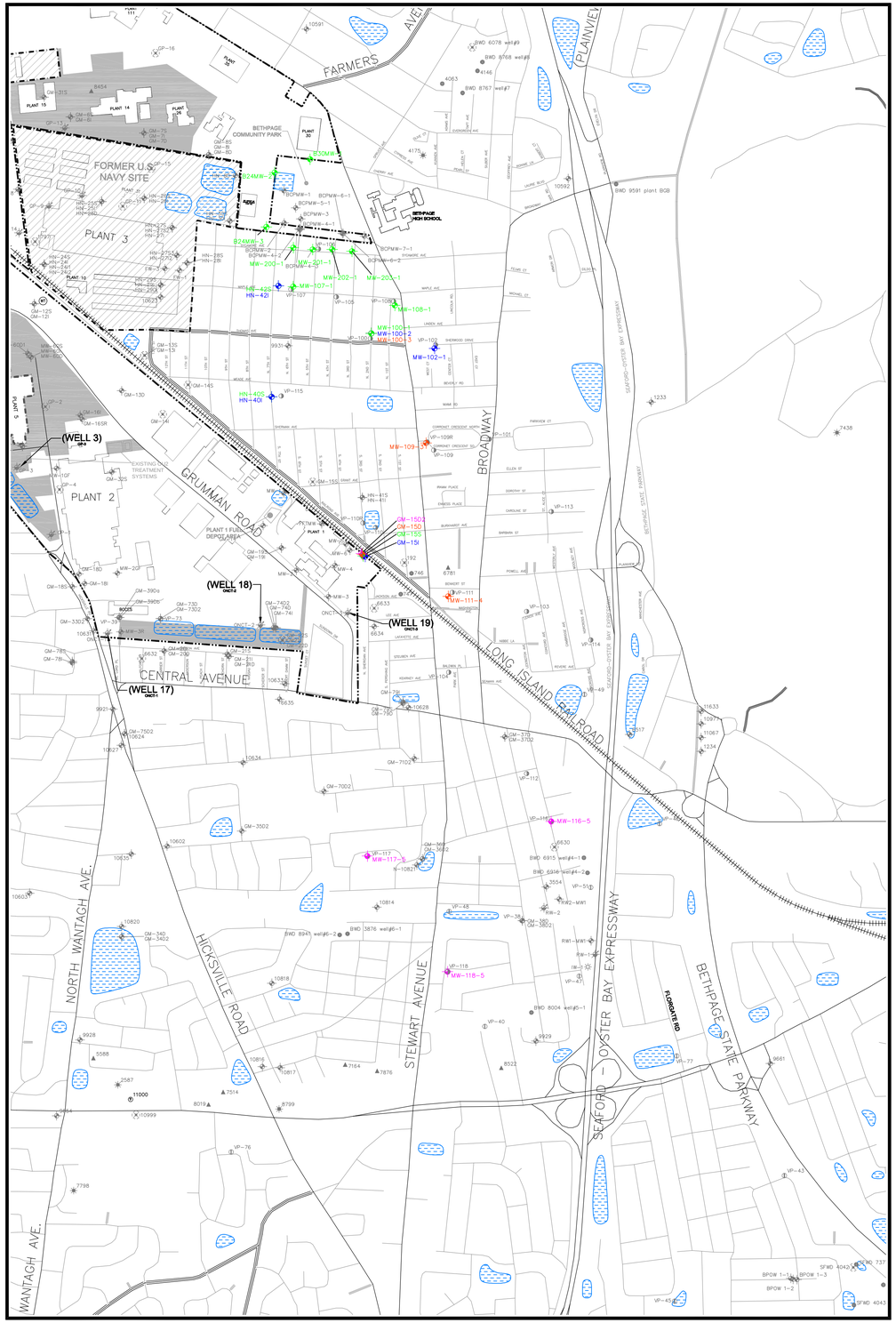
CONSTITUENT (ug/L)	Sample Location:	F-8-PZ	F-8-PZ	H-3-PZ	H-3-PZ	H-7-PZ	H-7-PZ
	Sample Date:	4/28/2009	4/28/2009	4/24-28/2009	4/24-28/2009	4/23/2009	4/23/2009
	Fraction:	Total	Dissolved	Total	Dissolved	Total	Dissolved
Metals							
Aluminum		**479000**	**221**	**13400**	< 100	**153000**	**191**
Antimony		< 60	< 60	< 60	< 60	< 60	< 60
Arsenic		**252**	< 10	< 10	< 10	**114**	< 10
Barium		**1370**	< 20	**168**	**98.2**	**641**	**20.9**
Beryllium		**16.6**	< 5	< 5	< 5	**5.9**	< 5
Boron		< 200	< 200	< 200	< 200	< 200	< 200
Cadmium		**10.4**	< 5	< 5	< 5	**39.5**	< 5
Calcium		**11400**	< 1000	**57200**	**54300**	**25700**	**11600**
Chromium		**569**	< 10	**1600**	< 10	**563**	< 10
Cobalt		**56.4**	< 50	< 50	< 50	< 50	< 50
Copper		**466**	< 20	**96.1**	< 20	**170**	< 20
Iron		**498000**	**498**	**10800**	< 100	**173000**	**2080**
Lead		**348**	< 5	**14.8**	< 5	**104**	< 5
Magnesium		**16500**	< 1000	**17700**	**16200**	**7530**	**2180**
Manganese		**1440**	< 10	**129**	**53.3**	**218**	**112**
Mercury		< 0.2	< 0.2	< 0.2	< 0.2	**0.33**	< 0.2
Nickel		**194**	< 40	**94.5**	< 40	**125**	< 40
Potassium		**32100**	< 2000	**9770**	**7220**	**19600**	< 2000
Selenium		**17.7**	< 10	< 10	< 10	< 10	< 10
Silver		< 10	< 10	< 10	< 10	< 10	< 10
Sodium		**20500**	**22500**	**109000**	**102000**	**19500 R**	**19500**
Thallium		< 10	< 10	< 10	< 10	< 10	< 10
Vanadium		**947**	< 50	< 50	< 50	**285**	< 50
Zinc		**741**	< 20	**81.1**	**86.3**	**645**	< 20

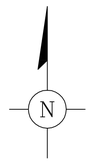
Notes and Abbreviations:

1. Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).
2. Samples analyzed for the TAL Metals using NYSDEC ASP Method 2000 ILM4.0.

Bold value indicates a detection

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TAL	Target analyte list
ASP	Analytical services protocol
ft bls	Feet below land surface
ug/L	Micrograms per liter
R	Value was rejected during data validation





EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF FORMER U.S. NAVY SITE
- LONG ISLAND RAILROAD
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY (AS OF 2003)
- DENOTES FORMER U.S. NAVY OWNED PROPERTY
- RECHARGE BASIN
- OBSERVATION, MONITORING WELL
- INDUSTRIAL WELL
- PUBLIC SUPPLY WELL
- IRRIGATION WELL
- INJECTION WELL
- NORTHROP GRUMMAN OR NAVY PRODUCTION WELL
- OU2 VERTICAL PROFILE BORING
- OU3 VERTICAL PROFILE BORING
- ABANDONED WELL

BWD BETHPAGE WATER DISTRICT
VPB VERTICAL PROFILE BORING
RI REMEDIAL INVESTIGATION
OU2 OPERABLE UNIT 2
OU3 OPERABLE UNIT 3

DESIGNATION OF HYDROGEOLOGIC ZONE FOR MONITORING WELL SCREENED INTERVALS

- SHALLOW
- INTERMEDIATE
- DEEP
- DEEP2

NOTES:

1. HIGHLIGHTED MONITORING WELL LOCATIONS ARE TO BE INCLUDED IN THE OFF-SITE MONITORING WELL SAMPLING NETWORK.
2. THIS FIGURE INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION RECEIVED BY ARCADIS IN RESPONSE TO A SEPTEMBER 2001 LETTER TO WATER DISTRICTS.
3. BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HUNTINGTON, HICKSVILLE, FREEPORT AND AMITYVILLE QUADRANGLES) AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.
4. NORTHROP GRUMMAN PROPERTY HOLDINGS BASED ON DATA PROVIDED IN JUNE 2003.
5. LOCATIONS OF MONITORING WELLS INSTALLED BY DVIRKA & BARTILUCCI (D&B) AT PLANT 1 (i.e., MW-1 TO MW-6) ARE APPROXIMATE BASED ON D&B SITE PLAN, PROVIDED ON DECEMBER 19, 2002.
6. HYDROGEOLOGIC ZONE BASED ON MODEL LAYER ELEVATIONS PRESENTED IN COMPREHENSIVE GROUNDWATER MODEL (ARCADIS 2003).

0 800' 1600'
SCALE IN FEET

ALL COORDINATES REFERENCED TO NORTH AMERICAN DATUM 1983

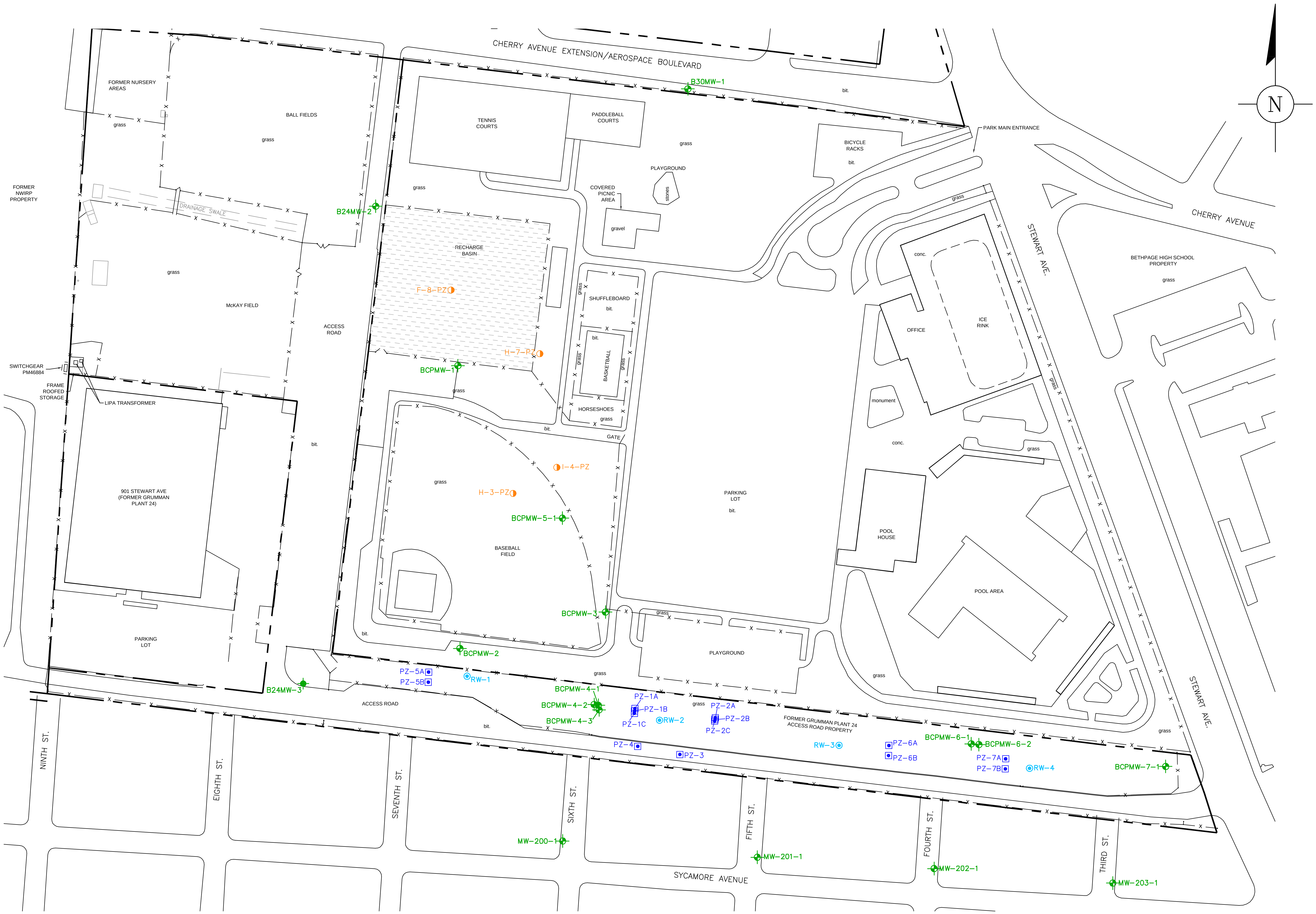
OPERABLE UNIT 3
FORMER GRUMMAN SETTLING PONDS
BETHPAGE, NEW YORK

SITE PLAN SHOWING OFF-SITE MONITORING WELL SAMPLING NETWORK

ARCADIS

FIGURE 1

CITY:MELVILLE-NY DIV/GROUP:ENV DB:A.Sanchez LD: PIC: PM:C.S.Giovanni TM:M.Reindl LYR:ON=*;OFF=*REF*
G:\ENVCAD\Melville-NY\NY001493\0709\00001\01 off-site.dwg LAYOUT: 1 SAVED: 7/8/2009 9:36 AM ACADVER: 17.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS_MELVILLE.CTB PLOTTED: 7/13/2009 2:32 PM BY: SANCHEZ, ADRIAN
XREFS: PROJECTNAME: NY001493.0709.00001
offsite



0 100' 200'

SCALE IN FEET

LEGEND:

— · — · —	NORTHROP GRUMMAN PROPERTY LINE
— x —— x —	FENCE
	BASIN
bit.	BITUMINOUS PAVEMENT
BCPMW-1	MONITORING WELL
F-8-PZ	PERCHED WATER PIEZOMETER
PZ-2C	GROUNDWATER PIEZOMETER
RW-2	RECOVERY WELL

NOTES:

1. RECOVERY WELLS, MONITORING WELLS, AND PIEZOMETERS SURVEYED TO NORTH AMERICAN DATUM (NAD) 83. PIEZOMETERS PZ-5A, PZ-5B, PZ-6A, PZ-6B, PZ-7A, AND PZ-7B ARE APPROXIMATE BASED ON FIELD MEASUREMENTS.
2. PARK FEATURES SHOWN WERE PRESENT PRIOR TO TOWN OF OYSTER BAY REDEVELOPMENT IN 2005.
3. WELLS ASSOCIATED WITH SOIL GAS INTERIM REMEDIAL MEASURE (IRM) NOT SHOWN.

OPERABLE UNIT 3
FORMER GRUMMON SETTLING PONDS
BETHPAGE, NEW YORK

ON-SITE WELL NETWORK

ARCADIS

FIGURE
2