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ENVIRONMENT

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

Subject:
Supplement to the Remedial Investigation Report (Study Area Groundwater), Operable Unit 3 (Former Grumman Settling Ponds) Bethpage, New York.

Date:
March 5, 2010

Contact:
Carlo San Giovanni

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Our ref:
NY001496.0810.00008

Dear Mr. Scharf:

ARCADIS is submitting this Supplement to the Remedial Investigation Report (Study Area Groundwater) to the New York State Department of Environmental Conservation (NYSDEC) on behalf of Northrop Grumman Systems Corporation (Northrop Grumman). The purpose of this report is to provide the results of the second of two groundwater sampling events conducted under the Remedial Investigation (RI) and also to:

- Compare the results of this sampling event (October – November 2009) to those from the July 2009 sampling event reported in the RI Report (Study Area Groundwater; ARCADIS 2009a)
- Determine if the additional data had any effect on the conceptual site model (CSM), as presented in the Study Area RI Report. and
- Provide additional conclusions and recommendations, as warranted

Methodology

This groundwater sampling event was carried out from October 21 to November 4, 2009. Like the July 2009 event, the October event consisted of sampling and analysis of groundwater from 15 new and existing monitoring wells located within the Study Area. Figure 1 shows Study Area monitoring well locations.

The groundwater samples collected were analyzed for target compound list (TCL) volatile organic compounds (VOCs), plus Freons 12, 22, and 113 as well as total and dissolved cadmium and chromium. Samples were collected and analyzed in accordance with the approved RI/FS Work Plan and addendum (ARCADIS

2006/ARCADIS 2009b). Sample collection logs and chains of custody for the October 2009 sampling event are provided in Appendix A.

Data were validated following approved RI/FS Work Plan protocols. The data usability summary reports (DUSRs) and NYSDEC Category B laboratory data package deliverables are provided in Appendix B.

Findings and Conclusions

The July and October/November 2009 analytical results for VOCs are provided in Table 1. In general, with the exception of Monitoring Well MW-116-5, comparison of the analytical results from the two events the VOC analytical results indicate expected variability in VOC plume concentrations over time. Both sampling rounds showed that chlorinated VOCs are the contaminants of concern, with trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2 DCE) being the predominant VOCs. Monitoring Well MW-116-5 showed the greatest increase in total VOC concentration over time (greater than 70 percent). Specifically, between July and November, the concentration of TCE increased from 1,100 micrograms per liter (µg/L) to 2,000 ug/L and the total VOC concentration increased from 1,251.5 µg/L to 2,175.3 µg/L.

Analytical results for cadmium and chromium are provided in Table 2. Consistent with the July results, there were no detections of cadmium in October/November. Monitoring Wells MW109-3 and MW111-4 exhibited chromium concentrations exceeding the NYSDEC standard, criteria, and guidance value (SCG) (50 µg/L) during the October/November event. Compared to the July event, concentrations of total and dissolved chromium increased in Well MW109-3 and decreased in Well MW111-4. During both sampling events, monitoring wells immediately downgradient of the Site (i.e., HN-40S, HN-40I, HN-42S, HN-42I, MW100-1, MW100-2, MW100-3, MW107-1, and MW108-1) exhibited no SCG exceedances for dissolved phase chromium. This finding indicates that the chromium concentrations at Wells MW109-3 and MW111-4 are not likely site-related.

The October/November data continues to support the CSM presented in the Study Area RI Report.

Recommendations

Based on the data obtained from the two RI monitoring well groundwater sampling events, ARCADIS recommends the following:

- Collect monthly groundwater samples from Monitoring Well MW116-5 for a period of one year (i.e., through November 2010) to evaluate VOC concentration

trends in the area and support remedial planning. Following completion of the monthly sampling program, the frequency of sampling will be re-evaluated.

- Re-sample Wells MW109-3 and MW111-4 for analysis of total and dissolved chromium during the second quarter of 2010.

The validated analytical results for the above recommended additional sampling activities will be provided to the NYSDEC in the administrative order on consent (AOC) progress reports.

If you have any questions or comments, please feel free to contact us.

Sincerely,

ARCADIS

David E. Stern
Senior Hydrogeologist

Carlo San Giovanni
Project Manager

Michael F. Wolfert
Project Director

Enclosures

Copies:
Jacquelyn Nealon, NYS Dept. of Health
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Joseph DeFranco, Nassau County Dept. of Health
John Cofman, Northrop Grumman Corporation
Kent A. Smith, Northrop Grumman Corporation
Matt Russo, Town of Oyster Bay

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Screen Internal (ft bls): / Sample Date:	NYSDEC SCGs	HN-40S (49-59) 7/14/2009	HN-40S (49-59) 10/22/2009	HN-40I (108-118) 7/14/2009	HN-40I (108-118) 10/22/2009
1,1,1-Trichloroethane		5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane		5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane		1	< 5	< 5	< 5	< 5
1,1-Dichloroethane		5	< 5	< 5	< 5	< 5
1,1-Dichloroethene		5	< 5	< 5	< 5	< 5
1,2-Dichloroethane		0.6	< 5	< 5	< 5	< 5
1,2-Dichloropropane		1	< 5	< 5	< 5	< 5
2-Butanone		50	< 50	< 50	< 50	< 50
2-Hexanone		50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone		50	< 50	< 50	< 50	< 50
Acetone		50	< 50 B	< 50	< 50	< 50
Benzene		1	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane		50	< 5	< 5	< 5	< 5
Bromoform		50	< 5	< 5	< 5	< 5
Bromomethane		5	< 5	< 5	< 5	< 5
Carbon Disulfide		60	< 5	< 5	< 5	< 5
Carbon tetrachloride		5	< 5	< 5	< 5	< 5
Chlorobenzene		5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)		NE	< 5	< 5	< 5	< 5
Chloroethane		5	< 5	< 5	< 5	< 5
Chloroform		7	**0.47 J**	**0.36 J**	**0.88 J**	**0.75 J**
Chloromethane		5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		5	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5
Dibromochloromethane		50	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5
Methylene Chloride		5	< 5	< 5	< 5	< 5
Styrene		5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 5	< 5	< 5	< 5
Toluene		5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5
Trichloroethylene		5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	< 5
Vinyl Chloride		2	< 2	< 2	< 2	< 2
Xylene-o		NE	< 5	< 5	< 5	< 5
Xylenes - m,p		NE	< 5	< 5	< 5	< 5
TVOC			**0.47**	**0.36**	**0.88**	**0.75**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Screen Internal (ft bls): / Sample Date:	NYSDEC SCGs	HN-42S (50-60) 7/8/2009	HN-42S (50-60) 10/21/2009	HN-42I (100-110) 7/8/2009	HN-42I (100-110) 10/21/2009	MW-100-1 (55-65) 7/9/2009	MW-100-1 (55-65) 10/26/2009	MW-100-1 (Rep) (55-65) 10/26/2009
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		1	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane		0.6	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane		1	< 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	< 50	< 50	< 50	< 50	< 50 J	< 50	< 50
Benzene		1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane		50	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform		50	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide		60	< 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)		NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform		7	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloromethane		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		5	< 5	< 5	**7.4**	**6.3**	**0.38 J**	**0.46 J**	**0.48 J**
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		50	< 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	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene		5	< 5	< 5	**20**	**17**	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride		2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o		NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TVOC			0	0	**27.4**	**23.3**	**0.38**	**0.46**	**0.48**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Screen Internal (ft bls): / Sample Date:	NYSDEC SCGs	MW-100-2 (145-155) 7/9/2009	MW-100-2 (145-155) 10/26/2009	MW-100-3 (237-247) 7/9/2009	MW-100-3 (237-247) 10/26/2009	MW-102-1 (137-147) 7/17/2009	MW-102-1 (137-147) 11/4/2009	MW-102-1 (Rep) (137-147) 11/4/2009
1,1,1-Trichloroethane		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane		1	< 25	< 50	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane		5	**6.9 J**	**7.6 J**	**0.43 J**	**0.36 J**	**0.42 J**	**0.5 J**	< 5
1,1-Dichloroethene		5	**3.5 J**	**3.6 J**	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane		0.6	< 25	< 50	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane		1	< 25	< 50	< 5	< 5	< 5	< 5	< 5
2-Butanone		50	< 250	< 500	< 50	< 50	< 50	< 50	< 50
2-Hexanone		50	< 250	< 500	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone		50	< 250	< 500	< 50	< 50	< 50	< 50	< 50
Acetone		50	< 250 B	< 500	< 50	< 50	< 50	< 50	< 50
Benzene		1	< 3.5	< 7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane		50	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Bromoform		50	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Bromomethane		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide		60	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Chlorobenzene		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)		NE	< 25	< 50	**0.66 J**	**0.51 J**	< 5	< 5	< 5
Chloroethane		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Chloroform		7	**8.8 J**	**8.5 J**	**2.4 J**	**3.5 J**	**0.73 J**	**0.8 J**	< 5
Chloromethane		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		5	**1300 D**	**1400**	**2.2 J**	**2.1 J**	< 5	< 5	< 5
cis-1,3-dichloropropene		0.4	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		50	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Methylene Chloride		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Styrene		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 25	< 50	**2.3 J**	**2.3 J**	< 5	< 5	< 5
Toluene		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		5	**6.5 J**	**43 J**	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		0.4	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Trichloroethylene		5	**150**	**190**	**64**	**61**	**0.51 J**	< 5	**3.1 J**
Trichlorotrifluoroethane (Freon 113)		5	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride		2	**35**	**29**	< 2	< 2	< 2	< 2	< 2
Xylene-o		NE	< 25	< 50	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		NE	< 25	< 50	< 5	< 5	< 5	< 5	< 5
TVOC			**1,510.7**	**1,681.7**	**72.0**	**69.8**	**1.7**	**1.3**	**3.1**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	Sample Location: / Screen Internal (ft bls): / Sample Date:	NYSDEC SCGs	MW-107-1 (78-88) 7/13/2009	MW-107-1 (78-88) 10/28/2009	MW-108-1 (67-77) 7/13/2009	MW-108-1 (67-77) 10/28/2009	MW-109-3 (233-243) 7/8/2009	MW-109-3 (233-243) 10/22/2009	MW-111-4 (448-468) 7/15/2009	MW-111-4 (448-468) 11/3/2009
1,1,1-Trichloroethane		5	< 5	< 5	< 5	< 5	< 50	< 50	9 J	< 250
1,1,2,2-Tetrachloroethane		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
1,1,2-Trichloroethane		1	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
1,1-Dichloroethane		5	1.1 J	0.5 J	< 5	< 5	16 J	17 J	35 J	32 J
1,1-Dichloroethene		5	< 5	< 5	< 5	< 5	5.7 J	7.7 J	26 J	22 J
1,2-Dichloroethane		0.6	< 5	< 5	< 5	< 5	4.5 J	5.8 J	27 J	26 J
1,2-Dichloropropane		1	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
2-Butanone		50	< 50	< 50	< 50	< 50	< 500	< 500	< 1000	< 2500
2-Hexanone		50	< 50	< 50	< 50	< 50	< 500	< 500	< 1000	< 2500
4-methyl-2-pentanone		50	< 50	< 50	< 50	< 50	< 500	< 500	< 1000	< 2500
Acetone		50	< 50	< 50 B	< 50	< 50	< 500 B	< 500	< 1000	< 2500
Benzene		1	< 0.7	< 0.7	< 0.7	< 0.7	< 7	< 7	< 14	< 35
Bromodichloromethane		50	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Bromoform		50	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Bromomethane		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Carbon Disulfide		60	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Carbon tetrachloride		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Chlorobenzene		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Chlorodifluoromethane (Freon 22)		NE	< 5	< 5	1.1 J	1.2 J	< 50	< 50	< 100	< 250
Chloroethane		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Chloroform		7	0.92 J	0.49 J	< 5	< 5	4.5 J	5.6 J	9.6 J	< 250
Chloromethane		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
cis-1,2-dichloroethene		5	51	36	< 5	< 5	1000	1100	1600	1500
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Dibromochloromethane		50	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Dichlorodifluoromethane (Freon 12)		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 50	< 50 B	< 100	< 250
Styrene		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Tetrachloroethene		5	1.1 J	1.1 J	< 5	< 5	5.9 J	6.2 J	8.8 J	< 250
Toluene		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
trans-1,2-dichloroethene		5	0.8 J	0.49 J	< 5	< 5	4 J	4.5 J	< 100	< 250
trans-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Trichloroethylene		5	110	85	0.43 J	0.34 J	1200	1700	5100 D	5700
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Vinyl Chloride		2	< 2	< 2	< 2	< 2	4.6 J	4 J	< 40	< 100
Xylene-o		NE	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
Xylenes - m,p		NE	< 5	< 5	< 5	< 5	< 50	< 50	< 100	< 250
TVOC			**164.9**	**123.6**	**1.5**	**1.5**	**2,245.2**	**2,850.8**	**6,815.4**	**7,280.0**

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

CONSTITUENT (ug/L)	NYSDEC SCGs	Sample Location: MW-116-5 (570-590) Screen Internal (ft bls): Sample Date: 7/22/2009	MW-116-5 (570-590) 11/3/2009	MW-117-5 (737-757) 7/20/2009	MW-117-5 (737-757) 10/29/2009	MW-118-5 (713-738) 7/21/2009	MW-118-5 (713-738) 10/29/2009
1,1,1-Trichloroethane	5	< 50	< 50	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 50	< 50	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 50	< 50	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 50	< 50	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 50	< 50	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	**6.5 J**	**7 J**	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 50	< 50	< 5	< 5	< 5	< 5
2-Butanone	50	< 500	< 500	< 50	< 50	< 50	< 50
2-Hexanone	50	< 500	< 500	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 500	< 500	< 50	< 50	< 50	< 50
Acetone	50	< 500	< 500	< 50	< 50	< 50 B	< 50
Benzene	1	< 7	< 7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 50	< 50	< 5	< 5	< 5	< 5
Bromoform	50	< 50	< 50	< 5	< 5	< 5	< 5
Bromomethane	5	< 50	< 50	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 50	< 50	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 50	< 50	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 50	< 50	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 50	< 50	< 5	< 5	< 5	< 5
Chloroethane	5	< 50	< 50	< 5	< 5	< 5	< 5
Chloroform	7	**15 J**	**13 J**	< 5	< 5	< 5	< 5
Chloromethane	5	< 50	< 50	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	**130**	**150**	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene	0.4	< 50	< 50	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 50	< 50	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 50	< 50	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 50	< 50	< 5	< 5	< 5	< 5
Methylene Chloride	5	< 50	< 50	< 5	< 5	< 5	< 5
Styrene	5	< 50	< 50	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 50	< 50	< 5	< 5	< 5	< 5
Toluene	5	< 50	< 50	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 50	**5.3 J**	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 50	< 50	< 5	< 5	< 5	< 5
Trichloroethylene	5	**1100**	**2000**	**0.71 J**	**0.81 J**	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 50	< 50	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 20	< 20	< 2	< 2	< 2	< 2
Xylene-o	NE	< 50	< 50	< 5	< 5	< 5	< 5
Xylenes - m,p	NE	< 50	< 50	< 5	< 5	< 5	< 5
TVOC		**1,251.5**	**2,175.3**	**0.71**	**0.81**	0	0

Notes and abbreviations on last page.

Table 1. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, 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.
3. During the laboratory TIC search, one TIC was detected. Methyl tert-butyl ether was detected at a concentration of 5.61 µg/L at monitoring well HN-40I.

Indicates an exceedance of an SCG

Bold value indicates a detection

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TCL	Target compound list
VOC	Volatile organic compound
ASP	Analytical services protocol
SCGs	Standard, criteria, and guidance values
TIC	Tentatively identified compound
ug/L	Micrograms per liter
TVOC	Total volatile organic compounds
NE	Not established
REP	Field replicate
J	Value is estimated
B	Compound detected in associated blank sample
D	Constituent detected at secondary dilution
ft bls	feet below land surface

Table 2. Concentrations of Metals in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Sample Location:		HN-40S	HN-40S	HN-40I	HN-40I	HN-42S	HN-42S	HN-42I	HN-42I	MW-100-1	MW-100-1	MW-100-1 (REP)
Screen Interval (ft bls):		(49-59)	(49-59)	(108-118)	(108-118)	(50-60)	(50-60)	(100-110)	(100-110)	(55-65)	(55-65)	(55-65)
Sample Date:		7/14/2009	10/22/2009	7/14/2009	10/22/2009	7/8/2009	10/21/2009	7/8/2009	10/21/2009	7/9/2009	10/26/2009	10/26/2009
CONSTITUENT (ug/L)	NYSDEC SCGs											
Total Cadmium	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dissolved Cadmium	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Total Chromium	50	< 10	< 10	**16.3**	< 10	< 10	< 10	< 10	< 10	**13.5**	< 10	< 10
Dissolved Chromium	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes and abbreviations on last page.

Table 2. Concentrations of Metals in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Sample Location:		MW-100-2	MW-100-2	MW-100-3	MW-100-3	MW-102-1	MW-102-1	MW-107-1	MW-107-1	MW-108-1	MW-108-1
Screen Interval (ft bls):		(145-155)	(145-155)	(237-247)	(237-247)	(137-147)	(137-147)	(78-88)	(78-88)	(67-77)	(67-77)
Sample Date:		7/9/2009	10/26/2009	7/9/2009	10/26/2009	7/17/2009	11/4/2009	7/13/2009	10/28/2009	7/13/2009	10/28/2009
CONSTITUENT (ug/L)	NYSDEC SCGs										
Total Cadmium	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dissolved Cadmium	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Total Chromium	50	**12.1**	< 10	**19.7**	< 10	**15.3**	< 10	**15.1**	< 10	**60**	**11.6**
Dissolved Chromium	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	**11.5**	**10.6**

Notes and abbreviations on last page.

Table 2. Concentrations of Metals in Groundwater Samples Collected from Study Area Monitoring Wells, Northrop Grumman Systems Corporation, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Sample Location:		MW-109-3	MW-109-3	MW-111-4	MW-111-4	MW-116-5	MW-116-5	MW-117-5	MW-117-5	MW-118-5	MW-118-5
Screen Interval (ft bls):		(233-243)	(233-243)	(448-468)	(448-468)	(570-590)	(570-590)	(737-757)	(737-757)	(713-738)	(713-738)
Sample Date:		7/8/2009	10/22/2009	7/15/2009	11/3/2009	7/22/2009	11/3/2009	7/20/2009	10/29/2009	7/21/2009	10/29/2009
CONSTITUENT (ug/L)	NYSDEC SCGs										
Total Cadmium	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dissolved Cadmium	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Total Chromium	50	**57.4**	**356**	**103**	**83**	< 10	< 10	**12.8**	< 10	**26.9**	< 10
Dissolved Chromium	50	**19.6**	**77.1**	**73.2**	**61.9**	< 10	< 10	< 10	< 10	< 10	< 10

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.

Indicates an exceedance of an SCG

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

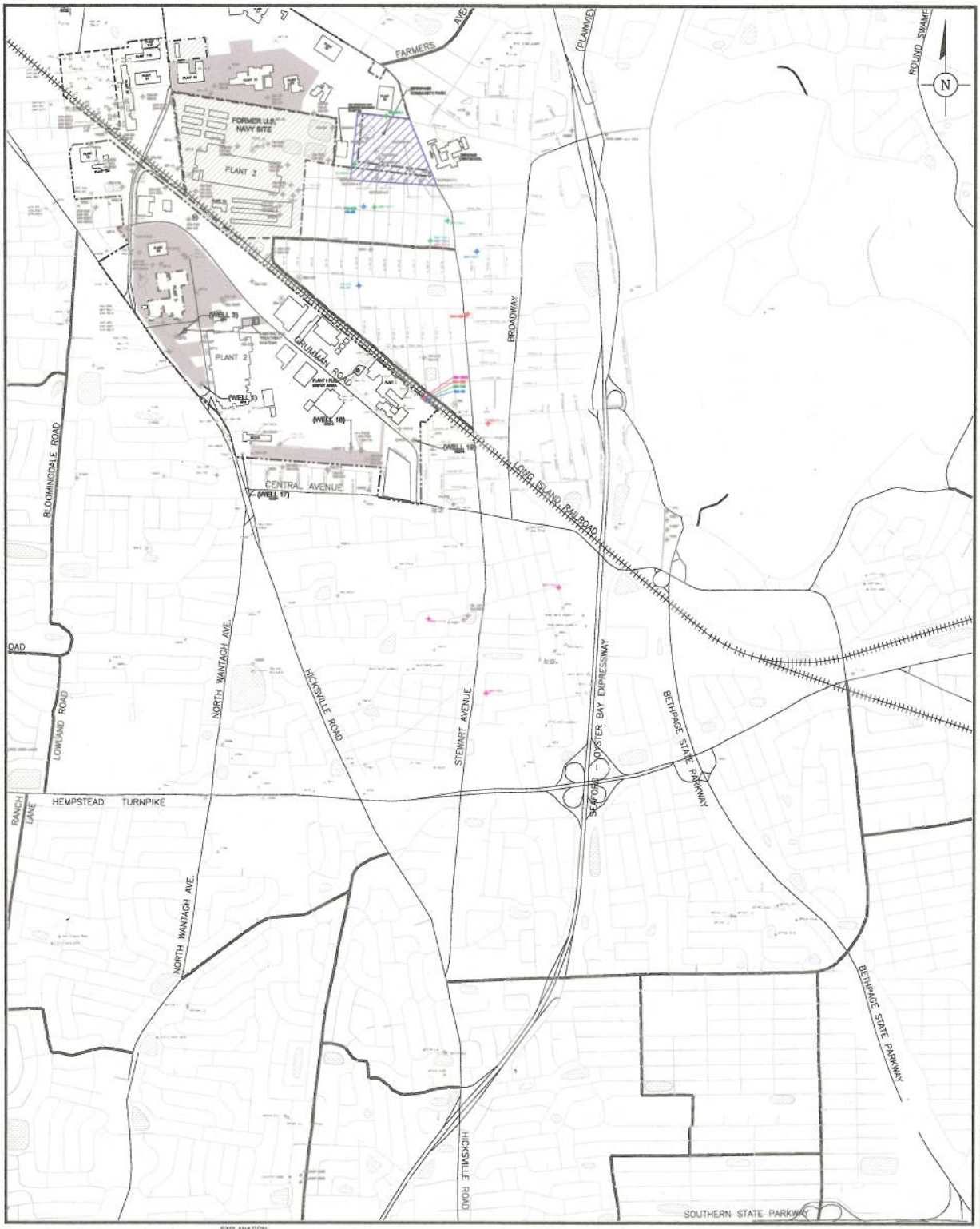
SCGs Standard, criteria, and guidance values

ug/L Micrograms per liter

REP Replicate sample

ft bls feet below land surface

CITY:Melville-NY DIV/GROUP:SER1 DB:A.Sanchez LD: PIC: PM:C.S.Giovanni TM:D.Stern LYR:ON=*;OFF=*REF*
G:\ENVCAD\Melville-NY\NY001499\910\00007\01 MWlocations.dwg LAYOUT: 1 SAVED: 2/5/2010 9:31 AM ACADVER: 17.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS_MELVILLE.CTB PLOTTED: 3/1/2010 12:57 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: NY001493.0809.00008
offsite



EXPLANATION:

- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE PROPERTY
- PROPERTY BOUNDARY OF THE FORMER U.S. NAVY PROPERTY
- PROPERTY BOUNDARY OF THE FORMER OCC PROPERTY
- LONG ISLAND RAILROAD
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY
- DENOTES FORMER U.S. NAVY OWNED PROPERTY
- RECHARGE BASIN
- SITE AREA
- OBSERVATION, MONITORING WELL
- INDUSTRIAL WELL
- PUBLIC SUPPLY WELL
- IRRIGATION WELL
- INJECTION WELL
- NORTHROP GRUMMAN OR NAVY PRODUCTION WELL
- ABANDONED WELL

DESIGNATION OF HYDROGEOLOGIC ZONE FOR MONITORING WELL SCREENED INTERVALS (ARCADIS 2003)	RANGES OF WELL SCREEN INTERVALS (FT BLS)
SHALLOW	49 TO 88
INTERMEDIATE	95 TO 188
DEEP	233 TO 468
DEEP2	536 TO 757

NOTES:

1. 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

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

STUDY AREA SHOWING MONITORING WELL LOCATIONS

ARCADIS

FIGURE 1