Mr. Jason Pelton
Project Manager
New York State Department of Environmental Conservation
Remedial Bureau D
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Albany, New York 12233-7015

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Subject:
Third Quarter 2019 Progress Report
Northrop Grumman Systems Corporation
Operable Unit 2, NYSDEC Site ID # 1-30-003A,
Bethpage, New York

ENVIRONMENT

Date:
October 10, 2019

Contact:
Art Zahradnik

Phone:
631.391.5208

Email:
art.zahradnik@arcadis.com

Our ref:
30017989.LARA5

Dear Jason:

In accordance with Appendix "A", Section XIII of Administrative Order on Consent (AOC) Index # W1-118-14-12, this letter reports Operable Unit 2 (OU2) activities performed by Northrop Grumman Systems Corporation (Northrop Grumman) during the Third Quarter of 2019 (July through September 2019). Activities planned for Fourth Quarter of 2019 (October through December 2019) are also described.

This progress report provides data that have been received as final and/or validated from the current period that are not included in other routine reporting for OU2 (e.g., quarterly reports as specified in the Groundwater Monitoring Plan).

As this is an ongoing remediation project, Northrop Grumman has transitioned the frequency of these progress reports from monthly to quarterly. Therefore, the next report will be submitted following the close of December 2019.

OU2 ACTIVITIES CONDUCTED DURING THIRD QUARTER 2019

OU2 On-Site Containment (ONCT) System

- Continued Operation, Maintenance, and Monitoring (OM&M) of the OU2 ONCT system, including preparation for further maintenance of South Basins, and inspections of Well 3R and Well 17 which included an inspection of the drop pipe, pump, and appurtenances, a video log of the well, and a well chemistry assessment.
- The supplemental carbon beds of the Tower 96 System underwent a carbon change out from September 19 to September 20, 2019.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - Well 3R of the Tower 96 System was shut down from July 15 through July 20, 2019 for scheduled well inspection.
    - Well 17 of the Tower 102 System was shut down for approximately six hours on July 19, 2019 for a scheduled stagnant well casing water sample that will assist in well maintenance planning.
    - Tower 96 of the ONCT System was shut down for approximately eight hours on July 20, 2019 due to a Calpine emergency power failure which also shutdown Tower 96.
    - Well 17 of the Tower 102 System was shut down from July 22 to July 31, 2019 for scheduled well inspection.
    - Tower 96 of the ONCT System was shut down for approximately five hours on August 13, 2019 due to Calpine maintenance events.
    - Tower 102 of the ONCT system was shut down for approximately five hours on August 23, 2019 to accommodate field measurements used to fabricate new sluice gates for the South Recharge Basins (Outfall 005) Distribution Chambers C and D.
    - Tower 96 of the ONCT System was shut down on September 13, 2019 due to a condensate pump failure. The pump was replaced and Tower 96 resumed normal operation on September 30, 2019.
- Completed Third Quarter 2019 ONCT system sampling
- Data not routinely reported are provided for the current period as follows:
    - Analytical data associated with Tower 96 Effluent and monthly sampling of ONCT Tower 96 system Remedial Wells 1 and 3R are provided in Table 1. Locations of wells are shown on Figure 1.

Regional Groundwater Monitoring & Outpost Well Monitoring

- Completed Third Quarter 2019 supplemental (quarterly) VOC sampling at Monitoring Wells GM-21D2, GM-33D2, GM-75D2 and GM-20D located just south of the ONCT remedial wells to monitor ONCT system hydraulic effectiveness following 2017 ONCT South Basins maintenance activities
- Completed Third Quarter 2019 routine OU2 groundwater monitoring activities (sampled former outpost wells BPOW 2-1, BPOW 2-2 and BPOW 2-3)
- Data not routinely reported are provided for the current period as follows:
  - Analytical data associated with the sample collected from the purge water discharged as part of the Second Quarter 2019 sampling events (Location ID “Discharge”)
- Prepared and submitted Second Quarter 2019 sampling event data (Form 1 packages) to NYSDEC

Northrop Grumman Cooperation with Navy

- Coordinated with Navy and completed Third Quarter 2019 sampling of additional outpost wells
- Prepared and submitted Second Quarter 2019 sampling event data for Navy owned wells (Form 1 packages) to Navy for distribution

Other

- Prepared and submitted the Second Quarter 2019 OU2 Operation, Maintenance, and Monitoring Report
- Prepared and submitted the Second Quarter 2019 AOC quarterly progress report

OU2 ACTIVITIES SCHEDULED FOR FOURTH QUARTER 2019

OU2 On-Site Containment (ONCT) System

- Continue OM&M of OU2 ONCT system, including continued preparation for and performance of maintenance of South Basins in Fourth Quarter 2019, dependent on weather, and rehabilitation of Well 3R.
- Conduct Fourth Quarter 2019 ONCT system sampling

Regional Groundwater Monitoring & Outpost Well Monitoring

- Conduct Fourth Quarter 2019 routine groundwater monitoring activities including collection of water levels from routine monitoring wells and remedial wells
- Continue supplemental (quarterly) VOC sampling at Monitoring Wells GM-21D2, GM-33D2, GM-75D2 and GM-20D

Northrop Grumman Cooperation with Navy

- Conduct Fourth Quarter 2019 sampling from additional outpost wells and plume monitoring wells

Other

- Prepare and submit the Third Quarter 2019 AOC quarterly progress report on October 10, 2019
- Prepare and submit the Third Quarter 2019 Annual OU2 Operation, Maintenance, and Monitoring Report by the end of November 2019

Sincerely,

Arcadis of New York, Inc.

Art Zahradnik
Project Manager

Enclosures

Copies:
Steven Karpinski, NYSDOH
Steven Scharf, NYSDEC
Donald Hesler, NYSDEC
Andrew Guglielmi, NYSDEC
Edward J. Hannon, Northrop Grumman
Jill Palmer, Esq., Northrop Grumman
Daniel Riesel, Esq., Sive, Paget & Riesel, P.C.
Mark A. Chertok, Esq., Sive, Paget & Riesel, P.C.
Lora Fly, NAVFAC Mid-Atlantic Environmental
Brian S. Murray, NAVFAC Mid-Atlantic Environmental
Bethpage Public Library
Carlo San Giovanni, Arcadis
Chris Engler, Arcadis
Mike Wolfert, Arcadis
File, Arcadis

TABLES

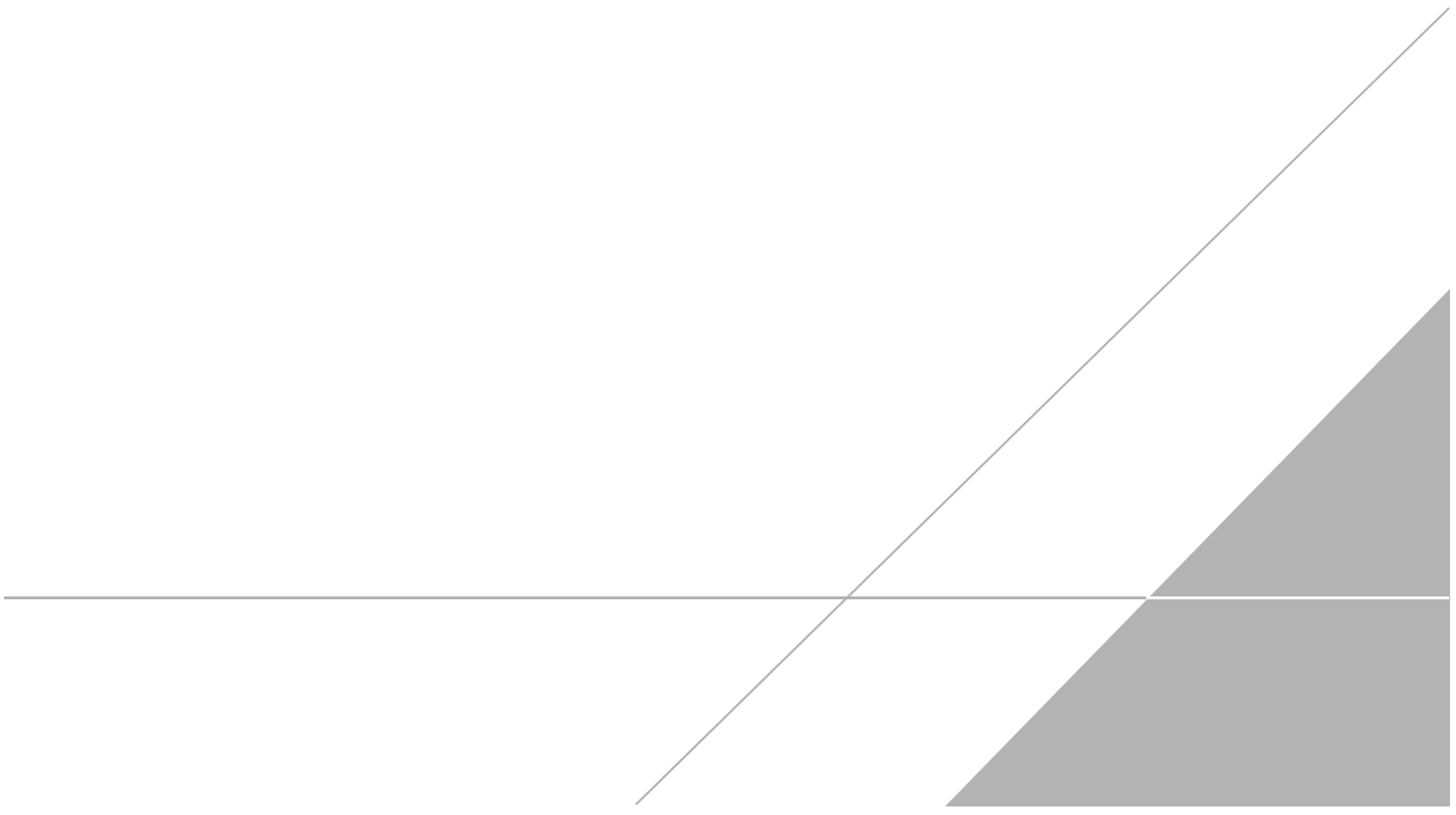

Table 1
Summary of Analytical Data
Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituents (units in µg/L)	Location ID: / Sample ID: / Date Sampled:	WELL 1 / WELL 1 / 7/22/2019	WELL 1 / WELL 1 / 9/4/2019	WELL 3R / WELL 3R / 7/22/2019
Volatile Organic Compounds[1]				
1,1,1-Trichloroethane		< 0.50	< 0.50	**0.57**
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane (Freon-113)		**2.5**	**3.2**	**2.0**
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		**0.74 J**	**0.71 J**	**1.5**
1,1-Dichloroethene		**2**	**2.2**	**3.6**
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		**4.2**	**4.0**	< 1.0
2-Butanone (MEK)		< 10	< 10	< 10
4-Methyl-2-Pentanone		< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0
Carbon Tetrachloride		< 1.0	< 1.0	< 1.0
CFC-11		--	--	--
CFC-12		--	--	--
Chlorobenzene		< 1.0	< 1.0	< 1.0
Chlorodibromomethane		< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0
Chloroform		**0.57**	**0.52**	< 0.50
Chloromethane		< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene		**5.6**	**5.5**	**3.7**
cis-1,3-Dichloropropene		< 1.0	< 1.0	< 1.0
Dichloromethane		< 0.50	< 0.50	< 0.50
Ethylbenzene		< 1.0	< 1.0	< 1.0
m&p-Xylenes		< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone (2-Hexanone)		< 5.0	< 5.0	< 5.0
Methyl-tert-butylether		--	--	--
o-Xylene		< 1.0	< 1.0	< 1.0
Styrene (Monomer)		< 1.0	< 1.0	< 1.0
Tetrachloroethene		**16.4**	**18.1**	**25.6**
Toluene		< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene		< 0.50	< 0.50	< 0.50
trans-1,3-Dichloropropene		< 1.0	< 1.0	< 1.0
Trichloroethene		**534**	**560**	**274**
Vinyl chloride		< 0.50	< 0.50	**1.4**
Total VOCs[2]		**570**	**590**	**310**
Total TICs		**5.6 J**	0	**10 J**

Notes and abbreviations on last page.

Table 1
Summary of Analytical Data
Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Location ID: / Sample ID: / Constituents (units in µg/L) / Date Sampled:	WELL 3R WELL 3R 9/4/2019	96 EFFLUENT 96 EFFLUENT 9/4/2019	Discharge[3,4] Discharge 6/12/2019
Volatile Organic Compounds[1]			
1,1,1-Trichloroethane	**0.63**	< 0.50	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane (Freon-113)	**2.9**	< 0.50	< 2.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	**1.5**	< 1.0	< 1.0
1,1-Dichloroethene	**3.8**	< 0.50	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
2-Butanone (MEK)	< 10	< 10	< 5.0
4-Methyl-2-Pentanone	< 5.0	< 5.0	< 5.0
Acetone	< 10	< 10	**12.6**
Benzene	< 0.50	< 0.50	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Bromomethane	< 2.0	< 2.0	< 1.0
Carbon Disulfide	< 2.0	< 2.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0
CFC-11	--	--	< 2.0
CFC-12	--	--	< 2.0
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0
Chloroform	< 0.50	< 0.50	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	**3.7**	< 0.50	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Dichloromethane	< 0.50	< 0.50	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0
m&p-Xylenes	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone (2-Hexanone)	< 5.0	< 5.0	< 5.0
Methyl-tert-butylether	--	--	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0
Styrene (Monomer)	< 1.0	< 1.0	< 2.0
Tetrachloroethene	**28.7**	< 0.50	< 1.0
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	< 0.50	< 0.50	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Trichloroethene	**289**	< 0.50	**0.73 J**
Vinyl chloride	**1.2**	< 0.50	< 1.0
Total VOCs[2]	**330**	0	**13.0**
Total TICs	0	0	**--**

Notes and abbreviations on last page.

Table 1
Summary of Analytical Data
Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

Constituents (units in µg/L)	Location ID: / Sample ID: / Date Sampled:	QAQC[4] TB061219RM2 6/12/2019	QAQC[5] TB-072319-PR-1 7/23/2019	QAQC TB-090419-MG-1 9/4/2019
Volatile Organic Compounds[1]				
1,1,1-Trichloroethane		< 1.0	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane (Freon-113)		< 2.0	< 0.50	< 0.50
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		< 1.0	< 0.50	< 0.50
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0
2-Butanone (MEK)		< 5.0	< 10	< 10
4-Methyl-2-Pentanone		< 5.0	< 5.0	< 5.0
Acetone		< 5.0	< 10	< 10
Benzene		< 1.0	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0
Bromomethane		< 1.0	< 2.0	< 2.0
Carbon Disulfide		< 1.0	< 2.0	< 2.0
Carbon Tetrachloride		< 1.0	< 1.0	< 1.0
CFC-11		< 2.0	--	--
CFC-12		< 2.0	--	--
Chlorobenzene		< 1.0	< 1.0	< 1.0
Chlorodibromomethane		< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 0.50	< 0.50
Chloromethane		< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene		< 1.0	< 0.50	< 0.50
cis-1,3-Dichloropropene		< 1.0	< 1.0	< 1.0
Dichloromethane		< 1.0	< 0.50	< 0.50
Ethylbenzene		< 1.0	< 1.0	< 1.0
m&p-Xylenes		< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone (2-Hexanone)		< 5.0	< 5.0	< 5.0
Methyl-tert-butylether		< 1.0	--	--
o-Xylene		< 1.0	< 1.0	< 1.0
Styrene (Monomer)		< 2.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 0.50	< 0.50
Toluene		< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene		< 1.0	< 0.50	< 0.50
trans-1,3-Dichloropropene		< 1.0	< 1.0	< 1.0
Trichloroethene		< 1.0	< 0.50	< 0.50
Vinyl chloride		< 1.0	< 0.50	< 0.50
Total VOCs[2]		0	0	0
Total TICs		**--**	0	0

Notes and abbreviations on last page.

Table 1
Summary of Analytical Data
Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

Notes and Abbreviations:

(1) Sample analysis by VOC Method 8260C unless otherwise noted.
(2) Results rounded to two significant figures.
(3) The sample is collected from purge water discharged as part of the Third Quarter 2019 sampling event.
(4) Purge water discharge sample analysis by VOC Method 624.1.
(5) Trip Blank dated July 23, 2019 accompanied samples taken on July 22, 2019.
Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2016), or as received as final from the laboratory as of the end of the AOC reporting period.

--	Not analyzed
<1.0	Constituent not detected above its laboratory quantification limit.
2.5	Bold value indicates a detection
µg/L	Micrograms per liter
J	Value is estimated concentration
OU2	Operable Unit 2
QAQC	Quality Assurance/Quality Control sample
TB	Trip Blank
Total TICs	Sum of individual Tentatively Identified Compounds - values are not calibrated
VOC	Volatile Organic Compound

FIGURES

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\NORTHROP GRUMMAN\OU2 ONCT OM&M PROGRAM\2019\01-DWG\NGC-ONCT-ONSITE-GW-REMEDY.dwg LAYOUT: 1 SAVED: 3/26/2019 5:14 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/26/2019 5:17 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: ----
X-LI-NY_R2&ST
X-1496X01

FORMER RUCO POLYMER SITE

NWIRP SITE (FORMER NAVY SITE)

BETHPAGE COMMUNITY PARK

BETHPAGE HIGH SCHOOL

OU-2 ON-SITE GROUNDWATER REMEDY TREATMENT SYSTEMS

OU2 MAIN FACILITY REMEDIAL SYSTEM (TOWER 96)

OU2 MAIN FACILITY REMEDIAL SYSTEM (TOWER 102)

OU2 OUTFALL 006

OU2 OUTFALL 005

SOUTH BASINS

HWD 10208

HWD 8779

BWD 8768

BWD 8767

BWD 9591

FW-03

HN-24I HN-24S

HN-42S HN-42I

HN-40S HN-40I

GM-13D

GM-16I GM-16SR

MW-3-1

WELL 3R

WELL 3

GM-17SR GM-17I GM-17D

10597

MW-1GF

GM-32S

PLANT 2

WELL 1

GM-39DA GM-39DB

MW-2GF

GM-18S GM-18I GM-18D

GM-73D3 GM-73D2 GM-73D

GM-33D2 10631

WELL-17

10600

GM-78S GM-78I GM-78D GM-78D2

MW-3R

GM-20I GM-20D

GM-21D2 10633

9921

GM-75D2 10624

10627

GM-21S GM-21I GM-21D

10634

GM-19S GM-19I

MW-5 MW-6 MW-4

GM-74I GM-74D GM-74D2 GM-74D3

WELL-18

WELL-19

GM-15SR GM-15I GM-15D GM-15D2

GM-79I GM-79D

10628

GM-71D2

GM-70D2

GM-35D2

GM-36D GM-36D2

N-10821

GM-37D GM-37D2

BWD 6915 6916

BWD 8941 3876

GM-38D GM-38D2

BWD 8004

GM-34D GM-34D2

TOH(LWD) 7076

BPOW 4-2R

BPOW 4-1R

TOH(LWD) 5303

BPOW 3-3 BPOW 3-4

BPOW 3-2 BPOW 3-1

NYAW 9338 NYAW 8480

BPOW 2-2 BPOW 2-3 BPOW 2-1

SFWD 6150

BPOW 1-4 BPOW 1-5 BPOW 1-6 BPOW 1-3 BPOW 1-1 BPOW 1-2

SFWD 7377 SFWD 5148 SFWD 4043

HAYPATH ROAD

FARMERS AVENUE

(PLAINVIEW ROAD)

BROADWAY

GRUMMAN ROAD

LONG ISLAND RAILROAD

CENTRAL AVENUE

BLOOMINGDALE ROAD

NORTH WANTAGH AVE.

HICKSVILLE ROAD

STEWART AVENUE

SEAFORD - OYSTER BAY EXPRESSWAY

BETHPAGE STATE PARKWAY

MALLARD ROAD

(GARDINER'S AVENUE)

LOWLAND ROAD

PIKE

BOUNDARY AVENUE

(107)

PLANT 111, PLANT 116, PLANT 115, PLANT 21, PLANT 37, PLANT 15, PLANT 14, PLANT 26, PLANT 35, PLANT 30, PLANT 3, PLANT 10, PLANT 25, PLANT 5, PLANT 1

EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF THE FORMER NAVY SITE
- PROPERTY BOUNDARY OF THE FORMER OXY/RUCO SITE
- LONG ISLAND RAILROAD
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY (AS OF 2009)
- DENOTES NAVY OWNED PROPERTY (AS OF 2014)
- DENOTES FORMER NAVY OWNED PROPERTY
- RECHARGE BASIN
- 10592 OBSERVATION/MONITORING/OUTPOST WELL (1)
- 9591 PUBLIC SUPPLY WELL (2)
- WELL-17 NORTHROP GRUMMAN REMEDIAL WELL
- PART OF ON-SITE REMEDY
- NWIRP NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- TOH (LWD) TOWN OF HEMPSTEAD LEVITOWN WATER DISTRICT
- HWD HICKSVILLE WATER DISTRICT
- SFWD SOUTH FARMINGDALE WATER DISTRICT
- BWD BETHPAGE WATER DISTRICT
- NYAW NEW YORK AMERICAN WATER

NOTE:

(1) THIS FIGURE DEPICTS OBSERVATION/MONITORING/OUTPOST WELLS INCLUDED IN THE OU-2 GROUNDWATER MONITORING PROGRAM.

(2) PUBLIC SUPPLY WELLS ARE NOT SAMPLED AS A PART OF THE OU2 GROUNDWATER MONITORING PROGRAM AND ARE ONLY FOR REFERENCE.

0 1000' 2000'

APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 2

LOCATIONS OF OF WELLS AND ON-SITE GROUNDWATER REMEDY

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1