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ENVIRONMENT

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

Date:
April 10, 2019

Contact:
Art Zahradnik

Phone:
631.391.5208

Email:
art.zahradnik@arcadis.com

Our ref:
NYNG2019.22TM.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 First Quarter of 2019 (January through March 2019). Activities planned for Second Quarter of 2019 (April through June 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 June 2019.

OU2 ACTIVITIES CONDUCTED DURING FIRST QUARTER 2019

OU2 On-Site Containment (ONCT) System

- Continued Operation, Maintenance, and Monitoring (OM&M) of the OU2 ONCT system, including preparation for maintenance of South Basins (easternmost)
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - Tower 102 of the ONCT System was shut down for approximately 5 hours on February 5, 2019 to accommodate planned boiler room repair.
    - Well 17, of Tower 102 of the ONCT System, was shut down on March 15 through March 18, 2019 due to a variable frequency drive (VFD) fault. The VFD cabinet ventilation fan was unable to be repaired, therefore it was replaced and Well 17 was restarted.
- Completed First 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

- Initiated and completed First Quarter 2019 routine OU2 groundwater monitoring activities
- Continued 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. Locations of wells are shown on Figure 1.
- Data not routinely reported are provided for the current period as follows:
    - Analytical data associated with the sample collected from purge water discharged as part of the Fourth Quarter 2018 sampling event are included in the attached table (Location ID “DISCHARGE”)
- Prepared and submitted Fourth Quarter 2018 sampling event data (Form 1 packages) to NYSDEC

Northrop Grumman Cooperation with Navy

- Coordinated with Navy and completed First Quarter 2019 sampling of additional outpost wells

- Prepared and submitted Fourth Quarter 2018 sampling event data for Navy owned wells, including Form 1 packages, to Navy for distribution

Other

- Prepared and submitted the Fourth Quarter 2018 AOC quarterly progress report
- Prepared and submitted the 2018 Annual OU2 Operation, Maintenance, and Monitoring Report

OU2 ACTIVITIES SCHEDULED FOR SECOND QUARTER 2019

OU2 On-Site Containment (ONCT) System

- Continue OM&M of OU2 ONCT system, including preparation for and performance of maintenance of South Basins (easternmost) in Second Quarter 2019, dependent on weather
- Conduct Second Quarter 2019 ONCT system sampling

Regional Groundwater Monitoring & Outpost Well Monitoring

- Conduct Second Quarter 2019 sampling, including water level collection, from wells in Northrop Grumman's routine monitoring program
- Continue supplemental (quarterly) VOC sampling at Monitoring Wells GM-21D2, GM-33D2, GM-75D2 and GM-20D

Northrop Grumman Cooperation with Navy

- Conduct Second Quarter 2019 sampling, including water level collection, from additional outpost wells and plume monitoring wells

Other

- Prepare and submit the First Quarter 2019 AOC quarterly progress report on April 10, 2019
- Prepare and submit the First Quarter 2019 OU2 Operation, Maintenance, and Monitoring Report

Sincerely,

Arcadis of New York, Inc.

Art Zahradnik
Associate 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.
Brian S. Murray, NAVFAC Mid-Atlantic Environmental
Bethpage Public Library
Carlo San Giovanni, Arcadis
David E. Stern, Arcadis
Mike Wolfert, Arcadis
File, Arcadis

TABLES

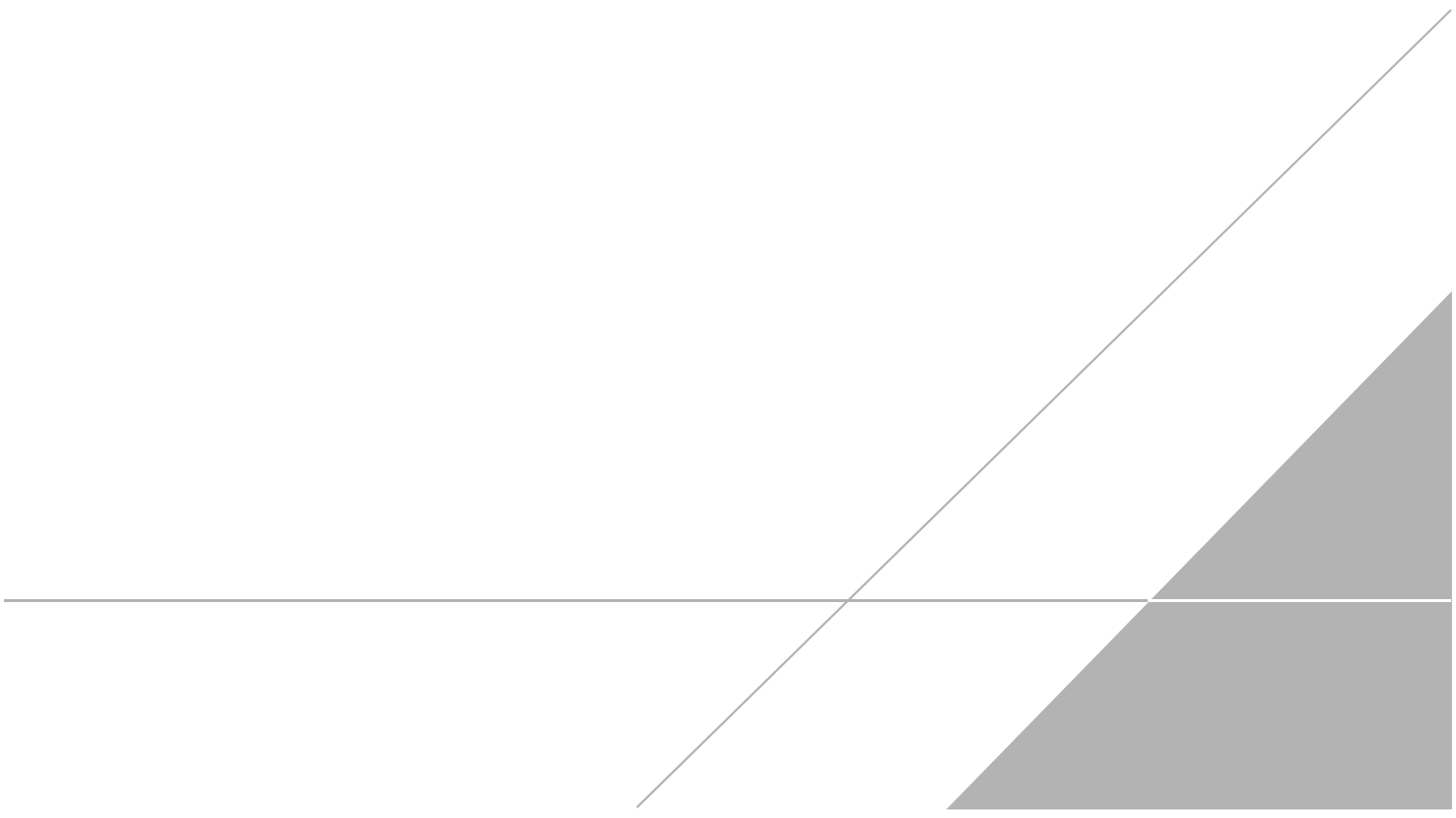

Table 1.
Summary of Analytical Data
Operable Unit 2, Northrop Grumman Systems Corporation
Bethpage, New York

Constituents (units in µg/L)	Location ID: / Sample ID: / Date:	DISCHARGE[3,4] / DISCHARGE_112018 / 11/20/2018	WELL 1 / WELL 1_20190110 / 1/10/2019	WELL 3R / WELL 3R_20190110 / 1/10/2019
Volatile Organic Compounds[1]				
1,1,1-Trichloroethane		< 1.0	< 0.50	**0.55**
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)		< 2.0	**1.5**	**1.3**
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	**0.76 J**	**1.4**
1,1-Dichloroethene		< 1.0	**2.2**	**3.5**
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	**4.2**	< 1.0
2-Butanone (MEK)		< 5.0	< 10	< 10
4-Methyl-2-Pentanone		< 5.0	< 5.0	< 5.0
Acetone		**5.7**	< 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	**5.1**	**3.5**
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	**19.2**	**29.3**
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		**4.0**	**583**	**301**
Vinyl chloride		< 1.0	< 0.50	**1.6**
Total VOCs[2]		**10**	**620**	**340**
Metals				
Cadmium (Total)		< 6.0	--	--
Chromium (Total)		**22.2**	--	--
Copper (Total)		< 20	--	--
Lead (Total)		< 6.0	--	--
Nickel (Total)		< 20	--	--
Zinc (Total)		**58.0**	--	--

Notes and Abbreviations on last page.

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

Location ID: / Sample ID: / Date: / Constituents (units in µg/L)	96 EFFLUENT T96 EFFLUENT (GW) 20190110 1/10/2019	QAQC TB112018MM1 11/20/2018	QAQC TB-011018-JJC-1 1/10/2019
Volatile Organic Compounds [1]			
1,1,1-Trichloroethane	< 0.50	< 1.0	< 0.50
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	< 0.50	< 2.0	< 0.50
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 0.50	< 1.0	< 0.50
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
2-Butanone (MEK)	< 10	< 5.0	< 10
4-Methyl-2-Pentanone	< 5.0	< 5.0	< 5.0
Acetone	< 10	< 5.0	< 10
Benzene	< 0.50	< 1.0	< 0.50
Bromodichloromethane	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Bromomethane	< 2.0	< 1.0	< 2.0
Carbon Disulfide	< 2.0	< 1.0	< 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	< 0.50	< 1.0	< 0.50
Chloromethane	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	< 0.50	< 1.0	< 0.50
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Dichloromethane	< 0.50	< 1.0	< 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)	< 1.0	< 2.0	< 1.0
Tetrachloroethene	< 0.50	< 1.0	< 0.50
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	< 0.50	< 1.0	< 0.50
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Trichloroethene	< 0.50	< 1.0	< 0.50
Vinyl chloride	< 0.50	< 1.0	< 0.50
Total VOCs [2]	0	0	0
Metals			
Cadmium (Total)	--	--	--
Chromium (Total)	--	--	--
Copper (Total)	--	--	--
Lead (Total)	--	--	--
Nickel (Total)	--	--	--
Zinc (Total)	--	--	--

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 Fourth Quarter 2018 sampling event
(4) Purge water discharge sample analysis by VOC Method 624.1 and Metals analysis by Method 6010D; total indicates unfiltered sample.
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.
5.7	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
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)

SOUTH BASINS

OU2 OUTFALL 006

OU2 OUTFALL 005

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

10597

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

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

WELL-18

WELL-19

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

GM-19S
GM-19I

MW-5
MW-6
MW-4

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

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

GM-79I
GM-79D

10628

GM-37D
GM-37D2

10634

GM-71D2

GM-70D2

GM-35D2

GM-36D
GM-36D2

N-10821

BWD 6915
BWD 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)

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