Mr. Jason Pelton
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Subject:

July to December 2020 Semi-Annual Progress Report
Northrop Grumman Systems Corporation
Operable Unit 3 (OU3),
NYSDEC Site ID # 1-30-003A,
Bethpage, New York

Our Ref: 30059266
Date: January 15, 2021

Dear Jason,

In accordance with Section III of Administrative Order on Consent (AOC) Index # W1-0018-04-01, and the May 2011 Work Plan for Modification of AOC Progress Report (work plan), this letter report describes OU3 activities performed by Northrop Grumman from July through December 2020. Activities planned for January through June 2021 are also summarized. In accordance with the approved work plan, these reports will be submitted to the NYSDEC on a semi-annual basis until it is determined that the reports are no longer necessary. The site plan showing well locations is provided on **Figure 1**.

OU3 Activities Conducted During July Through December 2020

Bethpage Park Soil Gas Containment System (Formerly Soil Gas IRM)

- Continued Operation, Maintenance, and Monitoring (OM&M) of the Bethpage Park Soil Gas Containment System (BPSGCS).
- Submitted BPSGCS Quarterly OM&M Reports (August and November 2020, respectively) to the NYSDEC.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - July 2020 shutdown for 47 hours due to transformer failure.
    - August 2020 shutdown for 309 hours due to failed power supply caused by inclement weather.
    - September 2020 shutdown for 17 hours due to blower replacement and maintenance.

- October 2020 shutdown for 4 hours due to system troubleshooting.

Bethpage Park Groundwater Containment System (Formerly Groundwater IRM)

- Continued OM&M of the Bethpage Park Groundwater Containment System (BPGWCS).
- Performed annual monitoring round for BPGWCS in July 2020. Data will be provided in the BPGWCS Annual 2020 Report (March 2021).
- Submitted BPGWCS Quarterly OM&M Reports (August and November 2020, respectively) to the NYSDEC.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
  - July 2020 shutdown for 75 hours due to transformer failure, Air Stripper chemical cleaning, and in situ thermal remediation (ISTR) system connection setup.
  - August 2020 shutdown for 181 hours for setup of the discharge connection line from the ISTR system into the combined influent to the Air Stripper, power outage from Tropical Storm Isaias, system troubleshooting, and transformer replacement.
  - August 2020 system operated at a reduced flowrate for 48 hours due to RW-2 troubleshooting.
  - September 2020 system operated at a reduced flowrate for 4 hours due to ISTR frac tank discharge.
  - October 2020 system shutdown for 17 hours due to system alarm troubleshooting.
  - October 2020 system operated at a reduced flowrate for 323 hours due to RW-1 pump failure and ISTR frac tank discharge.
  - November 2020 system operated at a reduced flowrate for 129 hours due to ISTR frac tank discharge and RW-2 pump failure.
  - December 2020 system was shutdown for 30.5 hours for effluent stack extension related activities.
  - December 2020 operated at a reduced flowrate for 10.3 hours due to ISTR frac tank discharge.

Other

- Performed quarterly monitoring rounds for Monitoring Wells MW109-3 and MW111-4 from July through December 2020. Performed monthly monitoring round for Monitoring Well MW116-5 from September through November 2020. Validated data obtained from the July through December 2020 period are provided in **Table 1 and well locations are shown in Figure 1.**
- December sampling of MW116-5 was not completed due to sampling equipment failure. Arcadis is currently procuring a new set of equipment. Sampling will resume once new equipment is obtained.

Jason Pelton
NYSDEC
January 15, 2021

OU3 Activities Scheduled During January Through June 2021

Bethpage Park Soil Gas Containment System

- Continue OM&M of the BPSGCS.
- Submit OU3 BPSGCS Annual 2020 Report (March 2021) and First Quarter 2021 Report (May 2021) to the NYSDEC.

Bethpage Park Groundwater Containment System

- Continue OM&M of the BPGWCS.
- Submit OU3 BPGWCS Annual 2020 Report (March 2021) and First Quarter 2021 Report (May 2021) to the NYSDEC.

Other

- Perform quarterly monitoring rounds for Monitoring Wells MW109-3 and MW111-4 and monthly monitoring rounds for Monitoring Well MW116-5.

Feel free to call us if you have any questions.

Sincerely,

Arcadis of New York, Inc.

Arnas Nemickas

Senior Hydrogeologist/ Project Manager

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Jason Pelton
NYSDEC
January 15, 2021

CC.
Edward Hannon, Northrop Grumman Corporation
Donald Hesler, NYSDEC
Jim Sullivan, NYS Dept. of Health
Donald Irwin, Nassau County Dept. of Health
Robin Putnam, Nassau County Dept. of Health
Richard Castle, Nassau County Dept. of Health
Carlo San Giovanni, Arcadis
Nidal Azzam, USEPA
Carol Stein, USEPA
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Enc. Tables

1 Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells

Figures

1 Site Plan Showing OU3 Well Locations

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman,
Bethpage, New York.

Constituents (units in ug/L)	Location ID: Sample Date:	MW-109-3 9/17/2020	MW-109-3 11/12/2020	MW-109-3 11/12/2020 (REP)		MW-111-4 9/17/2020	MW-111-4 9/17/2020 (REP)	MW-111-4 11/12/2020
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0		**0.70 J**	**0.62 J**	< 5.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 5.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0		**0.68 J**	**0.61 J**	< 5.0
1,1-Dichloroethane		**2.8**	**3.4**	**3.2**		**9.8**	**9.5**	**7.2**
1,1-Dichloroethene		**0.69 J**	**1.1**	**1.1**		**5.2**	**4.9**	**4.7 J**
1,2-Dichloroethane		**1.1**	**1.3**	**1.4**		**2.5**	**2.3**	< 5.0
1,2-Dichloropropane		< 1.0	**0.56 J**	**0.56 J**		**0.70 J**	**0.69 J**	< 5.0
1,3-Butadiene		< 5.0	< 5.0	< 5.0		< 5.0	< 5.0	< 5.0
1-chloro-1,1-difluoroethane		< 5.0	< 5.0	< 5.0		< 25	<50	<50
2-Butanone		< 10	< 10	**< 10**		< 50	<100	<100
2-Hexanone		< 5.0	< 5.0	< 5.0		< 25	<50	<50
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0		< 25	<50	<50
Acetone		< 10	< 10	< 10		< 50	<100	<100
Benzene		< 0.50	< 0.50	< 0.50		< 2.5	<5.0	<5.0
Bromodichloromethane		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Bromoform		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Bromomethane		< 2.0	< 2.0	< 2.0		< 10	<20	<20
Carbon Disulfide		< 2.0	< 2.0	< 2.0		< 10	<20	<20
Carbon Tetrachloride		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Chlorobenzene		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Chlorodifluoromethane (Freon 22)		< 5.0	< 5.0	< 5.0		< 25	<50	<50
Chloroethane		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Chloroform		**6.7**	**7.2**	**7.1**		**3.5**	**3.3**	**3.4 J**
Chloromethane		< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 5.0
cis-1,2-dichloroethene		**211 D**	**259**	**260**		**680 D**	**707 D**	**529**
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Dibromochloromethane		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Dichlorodifluoromethane (Freon 12)		< 2.0	< 2.0	< 2.0		< 10	<20	<20
Ethylbenzene		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Methylene Chloride		< 2.0	< 2.0	< 2.0		< 10	<20	<20
Styrene		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Tetrachloroethene		**1.4**	**1.0**	**1.0**		**7.3**	**7.1**	**6.2**
Toluene		< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		**1.0**	**1.6**	**1.6**		**3.8**	**4.5**	**11.6**
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0
Trichloroethylene		**203 DJ**	**218**	**216**		**1070 D**	**1110 D**	**941**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0		< 25	<50	<50
Vinyl Chloride		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Xylene-o		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
Xylenes - m,p		< 1.0	< 1.0	< 1.0		< 5.0	<10	<10
TVOCs		**428**	**493**	**492**		**1784**	**1851**	**1503**
1,4-Dioxane		**5.7 J**	**7.8**	**7.8**		**20**	**18**	**14**

Notes and Abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman,
Bethpage, New York.

Constituents (units in ug/L)	Location ID: Sample Date:	MW-116-5 7/23/2020	MW-116-5 8/13/2020	MW-116-5 9/18/2020	MW-116-5 10/23/2020	MW-116-5 11/13/2020
1,1,1-Trichloroethane		**3.1 J**	< 10	**3.7 J**	**3.5 J**	< 25
1,1,2,2-Tetrachloroethane		< 5.0	< 10	< 5.0	< 5.0	< 25
1,1,2-Trichloroethane		4.7 J	< 10	**4.4 J**	**4.1 J**	< 25
1,1-Dichloroethane		**13.4**	**12.1**	**16.8**	**15.6**	< 25
1,1-Dichloroethene		**14.7**	**15.4**	**16.8**	**21.2**	**16.4 J**
1,2-Dichloroethane		**27.5**	**27.9**	**27.6**	**29.1**	**27.2**
1,2-Dichloropropane		**8.4**	**7.9 J**	**8.5**	**9.0**	< 25
1,3-Butadiene		< 25	< 50	< 25	< 25	< 130
1-chloro-1,1-difluoroethane		< 25	< 50	< 25	< 25	< 130
2-Butanone		< 50	< 100	< 50	< 50	< 250
2-Hexanone		< 25	< 50	< 25	< 25	< 130
4-methyl-2-pentanone		< 50	< 100	< 50	< 50	< 250
Acetone		< 2.5	< 5.0	< 2.5	< 2.5	< 13
Benzene		< 5.0	< 10	< 5.0	< 5.0	< 25
Bromodichloromethane		< 5.0	< 10	< 5.0	< 5.0	< 25
Bromoform		< 10	< 20	< 10	< 10	< 50
Bromomethane		< 10	< 20	< 10	< 10	< 50
Carbon Disulfide		< 10	< 20	< 10	< 10	< 50
Carbon Tetrachloride		**2.9 J**	< 10	**3.1 J**	**3.2 J**	< 25
Chlorobenzene		< 20	<10	<25	<5.0	<5.1
Chlorodifluoromethane (Freon 22)		< 100	<50	<130	<25	<26
Chloroethane		< 20	<10	<25	<5.0	<5.1
Chloroform		**23.2**	**22.0**	**25.4**	**24.8**	**26.9**
Chloromethane		< 5.0	< 10	< 5.0	< 5.0	< 25
cis-1,2-dichloroethene		**659**	**580**	**797**	**690**	**632**
cis-1,3-dichloropropene		< 20	<10	<25	<5.0	<5.0
Dibromochloromethane		< 20	<10	<25	<5.0	<5.0
Dichlorodifluoromethane (Freon 12)		< 40	<20	<50	<10	<11
Ethylbenzene		< 20	<10	<25	<5.0	<5.1
Methylene Chloride		< 40	<20	<50	<10	<11
Styrene		< 20	<10	<25	<5.0	<5.0
Tetrachloroethene		< 20	<10	<25	<5.0	<5.0
Toluene		< 20	<10	<25	<5.0	<5.0
trans-1,2-dichloroethene		**5.5**	< 10	**11.5**	**4.0 J**	< 25
trans-1,3-dichloropropene		< 5.0	< 10	< 5.0	< 5.0	< 25
Trichloroethylene		**3530**	**3840**	**3810 D**	**3610**	**3520**
Trichlorotrifluoroethane (Freon 113)		< 100	<50	<130	<25	<26
Vinyl Chloride		< 20	<10	<25	<5.0	<5.0
Xylene-o		< 20	<10	<25	<5.0	<5.0
Xylenes - m,p		< 20	<10	<25	<5.0	<5.0
TVOCs		**4292**	**4518**	**4725**	**4415**	**4223**
1,4-Dioxane		**84**	**63**	**71 J**	**82**	**61**

Notes and Abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman,
Bethpage, New York.

ARCADIS Design & Consultancy for natural and built assets

Notes and Abbreviations:

Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).

Samples analyzed for TCL VOCs using EPA Method 8260C.

Samples analyzed for 1,4-Dioxane using USEPA Method 8270D SIM.

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
TVOC	Total Volatile Organic Compounds
ug/L	Micrograms per liter
J	Value is estimated
D	Diluted
REP	Blind replicate

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD:ALS PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\iamicell\BIM 360\Arcadis\ANA - Northrop Grumman\Project Files\OU2 SITEWIDE GW\2020\30037969\01-DWG\NGC-OU3 WELLS.dwg LAYOUT: 1 SAVED: 1/10/2020 8:15 PM ACADVER: 23.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 1/13/2021 5:26 PM BY: IAMICELI, KIMBERLY
XREFS: IMAGES: PROJECTNAME: ----
x-1496x01
X-LI-NY_RD&ST
X-BDR-EP

EXPLANATION:

- CURRENT NORTHROP GRUMMAN PROPERTY
- CURRENT NAVAL OWNED PROPERTY
- FORMER NORTHROP GRUMMAN PROPERTY BOUNDARY
- FORMER NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- MONITORING WELL
- REMEDIAL WELL
- PUBLIC SUPPLY WELL

NAVY AND BETHPAGE WELLS SHOWN FOR REFERENCE PURPOSES

0 500' 1000' 2000'

APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

SITE PLAN SHOWING OU3 WELL LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1