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Subject:

July to December 2021 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 20, 2022

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 2021. Activities planned for January through June 2022 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 2021

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 Second and Third Quarter 2021 OM&M Reports (August and November, respectively) to the NYSDEC.
- The BPSGCS was modified to begin extracting vapors from the In-Situ Thermal Remediation (ISTR) wellfield.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.

- August 2021
 - 39.75-hour planned shutdown from 8/21/21 – 8/23/21 due to Hurricane Henri.
- September 2021
 - 7.5-hour shutdown on 9/2/21 due to Blower 400 VFD fault.
 - 8-hour shutdown on 9/8/21 due to Blower 400 VFD fault.
 - 7.5-hour shutdown on 9/10/21 due to Blower 400 VFD fault.
 - 7-hour shutdown on 9/15/21 due to Blower 400 VFD fault.
 - 4-hour shutdown on 9/20/21 due to Blower 400 VFD fault.
 - 9-hour shutdown on 9/22/21 due to Blower 400 VFD fault.
- October 2021
 - 51-hour shutdown from 10/2/21 - 10/4/21 due to Blower 400 VFD fault.
 - 10-hour shutdown from 10/25/21 - 10/26/21 due to high system pressure.

Bethpage Park Groundwater Containment System (Formerly Groundwater IRM)

- Continued OM&M of the Bethpage Park Groundwater Containment System (BPGWCS).
- Submitted BPGWCS Second and Third Quarter 2021 OM&M Reports (August and November, respectively) to the NYSDEC.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
 - July 2021
 - 44.5-hour shutdown from 7/6/21 – 7/8/21 due to air stripper high pressure alarm. The air stripper was power washed to resolve the issue.
 - 66.25-hour shutdown from 7/9/21 – 7/12/21 due to air stripper high pressure alarm. Air stripper pressure meter adjusted.
 - August 2021
 - 6-hour shutdown on 8/4/21 for maintenance of well instrumentation.
 - 24.2-hour reduced flowrate operation from 8/4/21 – 8/5/21 for repair of RW-3.
 - 39.75-hour planned shutdown from 8/21/21 – 8/23/21 due to Hurricane Henri.
 - 363.25-hour reduced flowrate operation from 8/23/21 – 9/7/21 due to well RW-1 not running when restarting system. RW-1 remained off until contractor was available to install new pump and motor.
 - September
 - 25.5-hour reduced flowrate operation from 9/8/21 – 9/9/21 due to ISTR Baker Tank Discharge.
 - 7.25-hour reduced flowrate operation on 9/23/21 due to ISTR Baker Tank Discharge.

- October
 - 4-hour planned shutdown on 10/13/21 for new electric service for ISTR/Soil Gas modifications.
 - 5.25-hour planned shutdown on 10/20/21 for ISTR/Soil Gas new air compressor electric service installation.
 - 4-hour shutdown on 10/28/21 for scheduled maintenance.
- November
 - 4-hour reduced flowrate operation on 11/8/21 due to ISTR Baker Tank Discharge.
 - 7.25-hour shutdown on 11/16/21 for sampling of GAC and PPZ ECUs.
- December
 - 50.25-hour planned shutdown from 12/1/21 – 12/3/21 to replace the VGAC and PPZ filter media.

RW-21 Project Area Groundwater Monitoring

- Performed quarterly monitoring of Monitoring Well MW111-4 from July through December 2021.
- Performed quarterly monitoring of Monitoring Well MW109-3 during 2021 fourth quarter; 2021 third quarter sampling was not performed due to road paving activities being conducted by the Town of Oyster Bay making the well inaccessible.
- Performed monthly monitoring of Monitoring Well MW116-5 from July through December 2021.
- Validated data obtained from the July through November 2021 period is provided in **Table 1** and well locations are shown in **Figure 1**.
- December 2021 sampling of MW116-5 was completed; however, validated data was not available at the time this report was prepared. Validated data obtained from the December 2021 period will be provided in the following January through June 2022 period Semi-Annual Report.

OU3 Activities to be Scheduled During January Through June 2022

Bethpage Park Soil Gas Containment System

- Continue OM&M of the BPSGCS.
- Submit OU3 BPSGCS Annual 2021 Report (March 2022) and First Quarter 2022 Report (May 2022) to the NYSDEC.

Bethpage Park Groundwater Containment System

- Continue OM&M of the BPGWCS.
- Submit OU3 BPGWCS Annual 2021 Report (March 2022) and First Quarter 2022 Report (May 2022) to the NYSDEC.

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NYSDEC
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- RW-21 Project Area Groundwater Monitoring Continue quarterly monitoring of Monitoring Wells MW109-3 and MW111-4 and monthly monitoring of Monitoring Well MW116-5.
- Complete Baseline Groundwater Monitoring Well Sampling Work Plan and associated sampling activities.

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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CC.

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Jim Sullivan, NYS Dept. of Health
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Richard Castle, Nassau County Dept. of Health
Carlo San Giovanni, Arcadis
Nidal Azzam, USEPA
Alexis Stabulas, USEPA
Public Repository
File

Enclosures:

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

Tables

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 11/22/2021	MW-111-4 9/24/2021	MW-111-4 11/22/2021	MW-111-4 11/22/2021 REP112221NC
1,1,1-Trichloroethane		< 1.0	< 5.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 5.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 5.0	< 1.0	< 1.0
1,1-Dichloroethane		2.0	7.4	6.3	6.0
1,1-Dichloroethene		< 1.0	3.8 J	3.7	3.4
1,2-Dichloroethane		0.87 J	< 5.0	1.9	2.1
1,2-Dichloropropane		< 1.0	< 5.0	< 1.0	< 1.0
1,3-Butadiene		< 5.0	< 25	< 5.0	< 5.0
1-chloro-1,1-difluoroethane		< 5.0	--	< 5.0	< 5.0
2-Butanone		< 10	< 50	< 10	< 10
2-Hexanone		< 5.0	< 25	< 5.0	< 5.0
4-methyl-2-pentanone		< 5.0	< 25	< 5.0	< 5.0
Acetone		< 10	< 50	< 10	< 10
Benzene		< 0.50	< 2.5	< 0.50	< 0.50
Bromodichloromethane		--	--	--	--
Bromoform		< 1.0	< 5.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 10	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 10	< 2.0	< 2.0
Carbon Tetrachloride		< 1.0	< 5.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 5.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)		1.2 J	< 25	1.5 J	1.6 J
Chloroethane		< 1.0	< 5.0	< 1.0	< 1.0
Chloroform		4.8	3.3 J	2.2	2.2
Chloromethane		< 1.0	< 5.0	< 1.0	< 1.0
cis-1,2-dichloroethene		146	538	415	425
cis-1,3-dichloropropene		< 1.0	< 5.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 5.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)		< 2.0	< 10	< 2.0	< 2.0
Ethylbenzene		< 1.0	< 5.0	< 1.0	< 1.0
Methyl tert-Butyl Ether		--	--	--	--
Methylene Chloride		< 2.0	< 10	< 2.0	< 2.0
Styrene		< 1.0	< 5.0	< 1.0	< 1.0
Tetrachloroethene		1.4	8.3	6.8	6.5
Toluene		< 1.0	< 5.0	< 1.0	< 1.0
trans-1,2-dichloroethene		0.81 J	3.1 J	1.7	1.7
trans-1,3-dichloropropene		< 1.0	< 5.0	< 1.0	< 1.0
Trichloroethylene		225	954	766	801
Trichlorofluoromethane (CFC-11)		--	--	--	--
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 25	0.67 J	0.60 J
Vinyl Chloride		< 1.0	< 5.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 5.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 5.0	< 1.0	< 1.0
TVOCs		382.08	1517.9	1205.77	1250.1
1,4-Dioxane		3.9	12	9.0	9.8

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 7/27/2021	MW-116-5 8/27/2021	MW-116-5 9/24/2021	MW-116-5 10/27/2021	MW-116-5 11/22/2021
1,1,1-Trichloroethane		< 10	< 25	< 25	< 10	< 10
1,1,2,2-Tetrachloroethane		< 10	< 25	< 25	< 10	< 10
1,1,2-Trichloroethane		< 10	< 25	< 25	< 10	< 10
1,1-Dichloroethane		20.8	20.4 J	20.9 J	20.3	15.9
1,1-Dichloroethene		19.7	23.8 J	23.5 J	24.1	17.1
1,2-Dichloroethane		33.1	31.2	42.7	35.5	33.5
1,2-Dichloropropane		10.3	< 25	< 25	11.0	9.6 J
1,3-Butadiene		< 50	< 130	< 130	< 50	< 50
1-chloro-1,1-difluoroethane		< 50	< 130	< 130	< 250	< 50
2-Butanone		< 100	< 250	< 250	< 100	< 100
2-Hexanone		< 50	< 130	< 130	< 50	< 50
4-methyl-2-pentanone		< 50	< 130	< 130	< 50	< 50
Acetone		< 100	< 250	< 250	< 100	< 100
Benzene		< 5.0	< 13	< 13	< 5.0	< 5.0
Bromodichloromethane		< 10	< 25	< 25	< 10	< 10
Bromoform		< 10	< 25	< 25	< 10	< 10
Bromomethane		< 20	< 50	< 50	< 20	< 20
Carbon Disulfide		< 20	< 50	< 50	< 20	< 20
Carbon Tetrachloride		< 10	< 25	< 25	< 10	< 10
Chlorobenzene		< 10	< 25	< 25	< 10	< 10
Chlorodifluoromethane (Freon 22)		< 50	< 130	< 130	< 50	< 50
Chloroethane		< 10	< 25	< 25	< 10	< 10
Chloroform		26.6	28.1	28.8	25.6	32.1
Chloromethane		< 10	< 25	< 25	< 10	< 10
cis-1,2-dichloroethene		849	895	882	863	656
cis-1,3-dichloropropene		< 10	< 25	< 25	< 10	< 10
Dibromochloromethane		< 10	< 25	< 25	< 10	< 10
Dichlorodifluoromethane (Freon 12)		< 20	< 50	< 50	< 20	< 20
Ethylbenzene		< 10	< 25	< 25	< 10	< 10
Methyl tert-Butyl Ether		< 100	--	--	--	--
Methylene Chloride		< 20	< 50	< 50	< 20	< 20
Styrene		< 10	< 25	< 25	< 10	< 10
Tetrachloroethene		< 10	< 25	< 25	< 10	< 10
Toluene		< 10	< 25	< 25	< 10	< 10
trans-1,2-dichloroethene		10.4	< 25	< 25	< 10	< 10
trans-1,3-dichloropropene		< 10	< 25	< 25	< 10	< 10
Trichloroethylene		4080	4220	4440	3690	5310
Trichlorofluoromethane (CFC-11)		--	--	--	--	--
Trichlorotrifluoroethane (Freon 113)		< 50	< 130	< 130	< 50	< 50
Vinyl Chloride		< 10	< 25	< 25	< 10	< 10
Xylene-o		< 10	< 25	< 25	< 10	< 10
Xylene-m,p		< 10	< 25	< 25	< 10	< 10
TVOCs		5049.9	5218.5	5437.9	4669.5	6074.2
1,4-Dioxane		80	78	68	77	77

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.**

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.

Samples collected from September 2016 to June 2018 were analyzed for 1,4-Dioxane using USEPA Method 522.

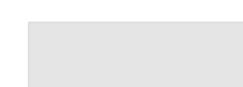


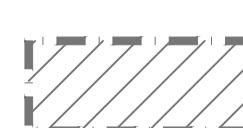



Bold value indicates a detection.

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
REP	Blind Replicate
--	Not Analyzed

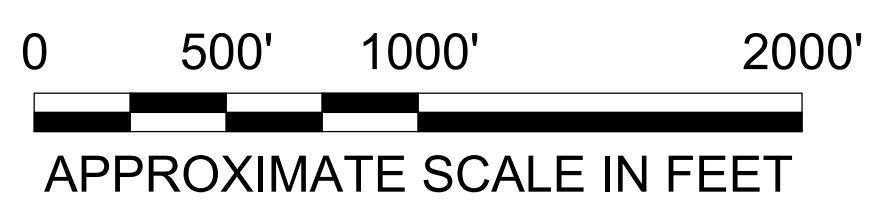
Figures




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



NORTHROP GRUMMAN SYSTEMS CORPORATION BETHPAGE, NEW YORK	
SITE PLAN SHOWING OU3 WELL LOCATIONS	
	FIGURE 1