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Date: July 21, 2023
Our Ref: 30123958
Subject: January to June 2023 Semi-Annual Progress Report
Northrop Grumman Systems Corporation
Operable Unit 3 (OU3),
NYSDEC Site ID # 1-30-003A,

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 January through June 2023. Activities planned for July through December 2023 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 January through June 2023

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 OU3 BPSGCS Annual 2022 and First Quarter 2023 Reports (March and May 2023, respectively) to the NYSDEC.
- Shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
 - 2-hour shutdown on 2/22/23 due to condensate removal.
 - 2-hour shutdown on 4/13/23 due to power shutdown for ISTR area.
 - 1-hour shutdown on 5/16/23 to troubleshoot vacuum readings at monitoring wells.

Bethpage Park Groundwater Containment System (Formerly Groundwater IRM)

- Continued OM&M of the Bethpage Park Groundwater Containment System (BPGWCS).
- Submitted BPGWCS Annual 2022 and First Quarter 2023 Quarterly OM&M Reports (March and May 2023, respectively) to the NYSDEC.

- Shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
 - 69.5-hour shutdown on 1/10/23 due to replacement of the bag filter housing units.
 - 1-hour shutdown on 4/6/23 to clean pumps BCPMW-4-1 and BCPMW-4-2.
 - 2-hour shutdown on 4/13/23 due to power shutdown for ISTR area.
 - 1-hour shutdown on 5/17/23 due to a bag filter changeout.
 - 20-hour shutdown on 5/29/23 due to an RW-2 low flow alarm.
 - 2.5-hour shutdown on 5/31/23 due to an RW-2 low flow alarm.
 - 23.5-hour shutdown on 6/11/23 due to an air stripper low pressure alarm.
 - 7-hour shutdown on 6/16/23 due to a bag filter differential pressure alarm.
 - 1.5-hour shutdown on 6/16/23 due to a bag filter changeout.
 - 42-hour shutdown on 6/17/23 due to clogged bag filters.
 - 0.5-hour shutdown on 6/20/23 due to an air stripper high pressure alarm.
 - 72.5 -hour shutdown on 6/24/23 due circuit board replacement in PLC.
 - 0.5-hour shutdown on 6/30/23 due to an air stripper high pressure alarm.

RW-21 Project Area

- Performed First and Second Quarter 2023 monitoring of Wells MW-109-3 and MW-111-4 in February and April 2023.
- Performed monthly monitoring of Well MW-116-5 from January through June 2023. The June 2023 validated data will be provided in the July to December 2023 period Semi-Annual Progress Report because the data was not available at the time this report was generated.
- Validated data for the June through December 2022 period is provided in **Table 1**, and well locations are shown on **Figure 1**.
- Began planning for the RW-21 Area Long-term groundwater monitoring well sampling program anticipated to begin following the RW-21 remedial treatment system start-up in July of 2023.

OU3 Activities Scheduled For July Through December 2023

Bethpage Park Soil Gas Containment System

- Continue OM&M of the BPSGCS.
- Submit OU3 BPSGCS Second Quarter 2023 and Third Quarter 2023 Reports (August and November 2023 respectively) to the NYSDEC.

Bethpage Park Groundwater Containment System

- Continue OM&M of the BPGWCS.
- Continue operation of BCPMW-4-1 and BCPMW-4-2 as additional recovery wells to the BPGWCS. Flow rates have decrease and a plan for well and pipeline repairs will be developed and implemented.
- Submit OU3 BPGWCS Second Quarter 2023 and Third Quarter 2023 Reports (August and November 2023 respectively) to the NYSDEC.

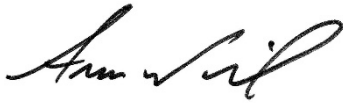
RW-21 Project Area

Jason Pelton
New York State Department of Environmental Conservation (NYSDEC)
July 21, 2023

- Continue quarterly monitoring of Monitoring Wells MW-109-3 and MW-111-4 and monthly monitoring of Monitoring Well MW-116-5 through July 2023.
- Complete data validation as specified in the QAPP for the 2023 sample period.
- Complete RW-21 Area Long-term groundwater monitoring well sampling program anticipated to begin following the RW-21 remedial treatment system start-up in July of 2023.

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. Edward Hannon, Northrop Grumman Corporation
Matthew Travis, NYSDEC
Jim Sullivan, NYS Dept. of Health
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Richard Castle, Nassau County Dept. of Health
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Nidal Azzam, USEPA
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Public Repository File

Enclosures:

Tables

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

Figure

- 1 Site Plan Showing OU3 Well Locations

Table

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in
Groundwater Samples Collected from Monitoring Wells:
MW-109-3, MW-111-4 and MW-116-5
Northrop Grumman
Bethpage, New York



Constituents (units in ug/L)	Location ID:	MW-109-3	MW-109-3	MW-109-3	MW-109-3
	Sample ID:	MW-109-3	REP021623SH1	MW-109-3	REP051123SV1
	Sample Date:	2/16/2023	2/16/2023	5/11/2023	5/11/2023
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 5.0	< 5.0	0.71 J	< 5.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		1.7	1.9	1.7	1.7
1,1-Dichloroethene		0.61 J	< 1.0	0.97 J	< 1.0
1,2-Dichloroethane		0.61 J	0.71 J	0.78 J	0.62 J
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0
1,3-Butadiene		< 5.0	< 5.0	< 5.0	< 5.0
1-chloro-1,1-difluoroethane		< 5.0	< 5.0	< 5.0	< 5.0
2-Butanone		< 10	< 10	< 10	< 10
2-Hexanone		< 5.0	< 5.0	< 5.0	< 5.0
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)		1.2 J	1.2 J	2.0 J	1.4 J
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		4.8	4.9	7.3	4.6
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		138	139	146	144
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)		< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		1.9	1.7	1.4	1.2
Toluene		< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		1.8	1.1	0.93 J	0.89 J
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		186	182	181	186
Trichlorotrifluoroethane (Freon 113)		--	--	--	--
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0
TVOCs		337	333	343	340
1,4-Dioxane		3.2	2.7	0.85 B	3.8 B

Notes and Abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in
Groundwater Samples Collected from Monitoring Wells:
MW-109-3, MW-111-4 and MW-116-5
Northrop Grumman
Bethpage, New York



Constituents (units in ug/L)	Location ID:	MW-111-4	MW-111-4
	Sample ID:	MW-111-4	MW-111-4
	Sample Date:	2/16/2023	5/11/2023
1,1,1-Trichloroethane		< 4.0	< 4.0
1,1,2,2-Tetrachloroethane		< 4.0	< 4.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 20	< 20
1,1,2-Trichloroethane		< 4.0	< 4.0
1,1-Dichloroethane		5.4	5.2
1,1-Dichloroethene		3.6 J	5.4
1,2-Dichloroethane		< 4.0	< 4.0
1,2-Dichloropropane		< 4.0	< 4.0
1,3-Butadiene		< 20	< 20
1-chloro-1,1-difluoroethane		< 20	< 20
2-Butanone		< 40	< 40
2-Hexanone		< 20	< 20
4-methyl-2-pentanone		< 20	< 20
Acetone		< 40	< 40
Benzene		< 2.0	< 2.0
Bromodichloromethane		< 4.0	< 4.0
Bromoform		< 4.0	< 4.0
Bromomethane		< 8.0	< 8.0
Carbon Disulfide		< 8.0	< 8.0
Carbon Tetrachloride		< 4.0	< 4.0
Chlorobenzene		< 4.0	< 4.0
Chlorodifluoromethane (Freon 22)		< 20	< 20
Chloroethane		< 4.0	< 4.0
Chloroform		3.2 J	3.7 J
Chloromethane		< 4.0	< 4.0
cis-1,2-dichloroethene		499	474
cis-1,3-dichloropropene		< 4.0	< 4.0
Dibromochloromethane		< 4.0	< 4.0
Dichlorodifluoromethane (Freon 12)		< 8.0	< 8.0
Ethylbenzene		< 4.0	< 4.0
Methylene Chloride		< 8.0	< 8.0
Styrene		< 4.0	< 4.0
Tetrachloroethene		8.1	5.8
Toluene		< 4.0	< 4.0
trans-1,2-dichloroethene		4.6	< 4.0
trans-1,3-dichloropropene		< 4.0	< 4.0
Trichloroethylene		611	575
Trichlorotrifluoroethane (Freon 113)		--	--
Vinyl Chloride		< 4.0	< 4.0
Xylene-o		< 4.0	< 4.0
Xylenes - m,p		< 4.0	< 4.0
TVOCs		1135	1069
1,4-Dioxane		7.2	4.6 B

Notes and Abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in
Groundwater Samples Collected from Monitoring Wells:
MW-109-3, MW-111-4 and MW-116-5
Northrop Grumman
Bethpage, New York



Constituents (units in ug/L)	Location ID:	MW-116-5	MW-116-5	MW-116-5	MW-116-5	MW-116-5
	Sample ID: Sample Date:	MW-116-5 1/12/2023	MW-116-5 2/17/2023	MW-116-5 3/15/2023	MW-116-5 4/13/2023	MW-116-5 5/11/2023
1,1,1-Trichloroethane		< 10	< 10	< 10	< 10	< 10
1,1,2,2-Tetrachloroethane		< 10	< 10	< 10	< 10	< 10
1,1,2-trichloro-1,2,2-trifluoroethane		< 50	< 50	< 50	< 50	< 50
1,1,2-Trichloroethane		< 10	5.5 J	< 10	< 10	< 10
1,1-Dichloroethane		21.3	17.3	16.5	17.7	18.4
1,1-Dichloroethene		20.4	22.1	15.6	23.8	33.8
1,2-Dichloroethane		31.5	32.3	25.0	30.2	29.9
1,2-Dichloropropane		8.5 J	< 10	7.2 J	8.7 J	7.5 J
1,3-Butadiene		< 50	< 50	< 50	< 50	< 50
1-chloro-1,1-difluoroethane		< 50	< 50	< 50	< 50	< 50
2-Butanone		< 100	< 100	< 100	< 100	< 100
2-Hexanone		< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone		< 50	< 50	< 50	< 50	< 50
Acetone		< 100	< 100	< 100	< 100	< 100
Benzene		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane		< 10	< 10	< 10	< 10	< 10
Bromoform		< 10	< 10	< 10	< 10	< 10
Bromomethane		< 20	< 20	< 20	< 20	< 20
Carbon Disulfide		< 20	< 20	< 20	< 20	< 20
Carbon Tetrachloride		< 10	< 10	< 10	< 10	< 10
Chlorobenzene		< 10	< 10	< 10	< 10	< 10
Chlorodifluoromethane (Freon 22)		< 50	< 50	< 50	< 50	< 50
Chloroethane		< 10	< 10	< 10	< 10	< 10
Chloroform		22.6	24.2	17.7	24.8	28.4
Chloromethane		< 10	< 10	< 10	< 10	< 10
cis-1,2-dichloroethene		871	870	709	860	885
cis-1,3-dichloropropene		< 10	< 10	< 10	< 10	< 10
Dibromochloromethane		< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane (Freon 12)		< 20	< 20	< 20	< 20	< 20
Ethylbenzene		< 10	< 10	< 10	< 10	< 10
Methylene Chloride		< 20	< 20	< 20	< 20	< 20
Styrene		< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		< 10	< 10	< 10	< 10	< 10
Toluene		< 10	< 10	< 10	< 10	< 10
trans-1,2-dichloroethene		6.5 J	< 10	< 10	5.7 J	8.1 J
trans-1,3-dichloropropene		< 10	< 10	< 10	< 10	< 10
Trichloroethylene		3900	4360	2890	3230	4280
Trichlorotrifluoroethane (Freon 113)		--	--	--	--	--
Vinyl Chloride		< 10	< 10	< 10	< 10	< 10
Xylene-o		< 10	< 10	< 10	< 10	< 10
Xylenes - m,p		< 10	< 10	< 10	< 10	< 10
TVOCs		4882	5331	3681	4201	5291
1,4-Dioxane		47	81	66	58	56 B

Notes and Abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in
Groundwater Samples Collected from Monitoring Wells:
MW-109-3, MW-111-4 and MW-116-5
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.

TVOC concentrations are rounded to the number of decimal places of the individual VOC with the least numerical precision (decimal place), including whole numbers with no decimal place.

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

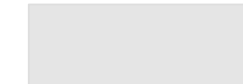




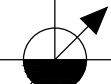

Bold value indicates a detection.

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
<1.0	Compound not detected above its laboratory quantification limit
ug/L	Micrograms per liter
J	Value is estimated
REP	Blind replicate
--	Not Analyzed
B	Indicates analyte found in associated method blank

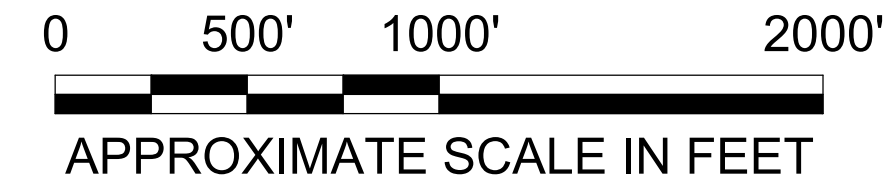
Figure



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**

 | **ARCADIS** | FIGURE 1