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

Arcadis of New York, Inc.
Two Huntington
Quadrangle
Suite 1S10
Melville
New York 11747
Phone: 631 249 7600
Fax: 631 249 7610

Subject:

January to June 2022 Semi-Annual Progress Report
Northrop Grumman Systems Corporation
Operable Unit 3 (OU3),
NYSDEC Site ID # 1-30-003A,
Bethpage, New York

Our Ref: 30123958
Date: July 11, 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 January through June 2022. Activities planned for July through December 202 2 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 2022

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 2021 Annual and First Quarter OM&M Report (March and May 2022, respectively) to the NYSDEC.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - 29.5-hour shutdown from 1/29/22 – 1/30/22 due to a BL-300 VFD fault.
    - 2-hour shutdown on 3/16/22 for condensate removal.

- 19-hour shutdown from 5/14/22 – 5/15/22 due to a loss of power.

Bethpage Park Groundwater Containment System (Formerly Groundwater IRM)

- Continued OM&M of the Bethpage Park Groundwater Containment System (BPGWCS).
- Began construction to add monitoring wells BCPMW-4-1 and BCPMW-4-2 as additional recovery wells to the BPGWCS.
- Submitted BPGWCS 2021 Annual and First Quarter 2022 Quarterly OM&M Reports (March and May 2022, respectively) to the NYSDEC.
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
  - 22-hour shutdown from 3/28/22 – 3/29/22 due to a system reset following the E-Stop being triggered.
  - 10.5-hour shutdown from 4/18/22 – 4/19/22 due to replacement of the bag filters following an air stripper high pressure alarm and bag filter high differential pressure alarm.
  - 34.5-hour shutdown from 4/30/22 – 5/2/22 due to the building sump high level alarm. The sump alarms were adjusted to resolve the issue.
  - 6-hour shutdown on 5/5/22 due to the building sump high level alarm. The sump alarms were adjusted to resolve the issue.
  - 34-hour shutdown from 5/14/22 – 5/16/22 due to a loss of power.
  - 3-hour shutdown on 5/17/22 to install pipe to connect effluent water line to two exterior GAC tanks for the addition of wells BCPMW-4-1 and BCPMW-4-2 as recovery wells.
  - 5-hour reduced flowrate operation on 5/18/22 to conduct excavation activities for the addition of wells BCPMW-4-1 and BCPMW-4-2 as recovery wells.
  - 53.5-hour shutdown from 5/18/22 – 5/20/22 due to high pressure alarms.
  - 122.5-hour reduced flowrate operation from 5/20/22 – 5/25/22 due to maintenance on RW-1 and RW-4.
  - 5-hour shutdown on 5/28/22 due to the air stripper high pressure alarm.
  - 2.5-hour reduced flowrate operation on 6/21/22 due to an electrical tie in at RW-21.
  - 3.5-hour shutdown on 6/21/22 to decrease the high-water level in the air stripper tower.
  - 1.5-hour reduced flowrate operation on 6/23/22 due to electrical maintenance.
  - 2.5-hour reduced flowrate operation on 6/28/22 due to electrical maintenance.

RW-21 Project Area

- Performed First and Second Quarter 2022 monitoring of Wells MW-109-3 and MW-111-4 in March and May 2022. Well MW-111-4 was re-sampled in June 2022 to address a packer inflation issue identified while reviewing sample documentation associated with the May 2022 sample event. The June 2022 MW-111-4 validated data will be provided in the June to December 2022 period Semi-Annual Progress Report.
- Performed monthly monitoring of Well MW-116-5 from January through June 2022. An issue similar to Well MW-111-4 was identified during review of the May 2022 sample documentation for Well MW-116-5. The well was re-sampled in June 2022. The June 2022 validated data will be provided in the June to December 2022 period Semi-Annual Progress Report.
- Validated data for the January through June 2022 period is provided in **Table 1,** and well locations are shown on **Figure 1.**
- Completed the majority of the RW-21 Area Baseline groundwater monitoring well sampling program (February 2022 Baseline Groundwater Sampling Work Plan) throughout this period. It was observed during the pre-sample well condition survey that Well MW-118-5 may be affected by sediment intrusion, so this well was assessed by a driller on 6/22/22. Minor repairs were made, the in-well equipment was inspected and determined to be functional, and relatively limited sediment was noted to exist within the well sump. Northrop Grumman is currently coordinating the sampling of this well within the beginning to middle of August 2022. Analytical data associated with the RW-21 Area Baseline Groundwater Monitoring Well Sampling Program will be provided under separate cover in the Third Quarter of 2022.
- Submitted Start Up Plan for the RW-21 Area Remedy to NYSDEC on 4/28/2022.

OU3 Activities Scheduled For July Through December 2022

Bethpage Park Soil Gas Containment System

- Continue OM&M of the BPSGCS.
- Submit OU3 BPSGCS Second Quarter 2022 and Third Quarter 2022 Reports (August and November 2022 respectively) to the NYSDEC.

Bethpage Park Groundwater Containment System

- Continue OM&M of the BPGWCS.
- Start-up and operation of BCPMW-4-1 and BCPMW-4-2 as additional recovery wells to the BPGWCS.
- Submit OU3 BPGWCS Second Quarter 2022 and Third Quarter 2022 Reports (August and November 2022 respectively) to the NYSDEC.

RW-21 Project Area

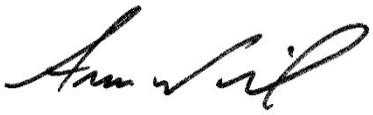
- Continue quarterly monitoring of Monitoring Wells MW-109-3 and MW-111-4 and monthly monitoring of Monitoring Well MW-116-5.
- Complete data validation as specified in the QAPP for the 2022 sample period.

- Complete the RW-21 Area Baseline Groundwater Sampling Program by sampling Monitoring Well MW-118-5.
- Complete data validation associated with the RW-21 Area Baseline Groundwater Sampling Program.

Feel free to call us if you have any questions.

Sincerely,

Arcadis of New York, Inc.



Arnas Nemickas

Senior Hydrogeologist/ Project Manager

Email: arnas.nemickas@arcadis.com

Direct Line: 631.391.5212

CC.
Edward Hannon, Northrop Grumman Corporation
Matthew Travis, NYSDEC
Jim Sullivan, NYS Dept. of Health
Angela Pettinelli, 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
Alexis Stabulas, USEPA
Public Repository
File

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: 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-111-4	MW-116-5	MW-116-5	MW-116-5	MW-116-5	MW-116-5	MW-116-5
	Sample ID:	MW-109-3	MW-109-3	MW-111-4	MW-116-5	MW-116-5	MW-116-5	MW-116-5	REP031622BW1	MW-116-5
	Sample Date:	3/17/2022	5/11/2022	3/17/2022	12/21/2021	1/19/2022	2/9/2022	3/16/2022	3/16/2022	4/15/2022
1,1,1-Trichloroethane		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		< 5.0	< 5.0	< 5.0	< 20	< 10	< 10	< 10	**5.7 J**	< 10
1,1-Dichloroethane		< 1.0	< 1.0	**5.7**	**19.7 J**	**18.4**	**21.9**	**20.2**	**20.7**	**23.9**
1,1-Dichloroethene		**2.3**	**1.9**	< 5.0	**20.0**	**19.7**	**23.6**	**22.8**	**22.3**	**22.5**
1,2-Dichloroethane		< 1.0	**0.73 J**	< 5.0	**36.2**	**30.0**	**38.7**	**32.1**	**33.3**	**38.8**
1,2-Dichloropropane		**0.73 J**	**0.78 J**	< 5.0	< 20	**8.0 J**	< 10	**9.0 J**	**9.6 J**	**11.5**
1,3-Butadiene		< 1.0	< 1.0	< 25	< 100	< 50	< 50	< 50	< 50	< 50
1-chloro-1,1-difluoroethane		< 5.0	< 5.0	< 25	< 100	< 50	< 50	< 50	< 50	< 50
2-Butanone		< 10	< 10	< 50	< 200	< 100	< 100	< 100	< 100	< 100
2-Hexanone		< 5.0	< 5.0	< 25	< 100	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone		< 5.0	< 5.0	< 25	< 100	< 50	< 50	< 50	< 50	< 50
Acetone		< 10	< 10	< 50	< 200	< 100	< 100	< 100	< 100	< 100
Benzene		< 0.50	< 0.50	< 2.5	< 10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Bromoform		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Bromomethane		< 2.0	< 2.0	< 10	< 40	< 20	< 20	< 20	< 20	< 20
Carbon Disulfide		< 2.0	< 2.0	< 10	< 40	< 20	< 20	< 20	< 20	< 20
Carbon Tetrachloride		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Chlorobenzene		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Chlorodifluoromethane (Freon 22)		**1.4 J**	**2.4 J**	< 25	< 100	< 50	< 50	< 50	< 50	< 50
Chloroethane		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Chloroform		**6.1**	**3.9**	**2.6 J**	**31.6**	**23.1**	**41.1**	**22.8**	**24.3**	**24.3**
Chloromethane		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
cis-1,2-dichloroethene		**214**	**145**	**509**	**844**	**815**	**871**	**926**	**980**	**883**
cis-1,3-dichloropropene		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Dibromochloromethane		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane (Freon 12)		< 2.0	< 2.0	< 10	< 40	< 20	< 20	< 20	< 20	< 20
Ethylbenzene		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Methylene Chloride		< 2.0	< 2.0	< 10	< 40	< 20	< 20	< 20	< 20	< 20
Styrene		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		**0.97 J**	**1.6**	**7.5**	< 20	< 10	< 10	< 10	< 10	< 10
Toluene		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
trans-1,2-dichloroethene		**1.3**	**1.4**	< 5.0	< 20	< 10	< 10	**6.5 J**	**5.5 J**	**11.3**
trans-1,3-dichloropropene		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Trichloroethylene		**239**	**255**	**873**	**4,550**	**5,020**	**6,540**	**5,850**	**5,570**	**4,760**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 25	< 100	< 50	< 50	< 50	< 50	< 50
Vinyl Chloride		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Xylene-o		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
Xylenes - m,p		< 1.0	< 1.0	< 5.0	< 20	< 10	< 10	< 10	< 10	< 10
TVOCs		**4,656**	**413**	**1,398**	**5,502**	**5,934**	**7,536**	**6,889**	**6,671**	**5,775**
1,4-Dioxane		**6.1 F1**	**4.1**	**14**	**75**	**77**	**89**	**110**	**98**	**130**

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

(1)	Sample was received out of temperature due to delayed delivery.

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
E	Value exceeds calibration range
REP	Blind replicate
--	Not Analyzed
D	Diluted
F1	Matrix Spike and/or Matrix Spike Duplicate recovery exceeds control limits

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

FIGURE 1