ARCADIS Design & Consultancy for natural and built assets

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ENVIRONMENT

Subject:

2017 Second Quarter Operation Maintenance and Monitoring Report, Operable Unit 2, Northrop Grumman Systems Corporation and Naval Weapons Industrial Reserve Plant (NWIRP) Sites, Bethpage, New York.
(NYSDEC Site #s 1-30-003A and B)

Date:
August 31, 2017

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Our ref:
NY001496.0216.RPTI4
NY001496.0416.NAVI4

Dear Jason:

On behalf of Northrop Grumman Systems Corporation (Northrop Grumman), Arcadis is providing the NYSDEC with the 2017 Second Quarter Operation Maintenance and Monitoring Report (Report). This Report was prepared to document the operation, maintenance, and monitoring (OM&M) activities conducted for the on-site portion of the Operable Unit 2 (OU2) groundwater remedy and the results of ongoing volatile organic compound (VOC) and inorganic monitoring in groundwater to meet the remedial objectives set forth in the March 2001 OU2 Record of Decision (ROD).

Table 1 summarizes OU2 remedial system performance operational data and water balance. Tables 2 and 3 provide the analytical results for remedial system water and vapor samples for this period. Tables 4A and 4B provide the air modeling inputs and outputs and resulting analyses, based on quarterly vapor samples collected from the Tower 96 and Tower 102 systems, respectively, for this period. Table 5 provides a summary of percent mass removal of TCE from first quarter 2015 through second quarter 2017. Tables 6, 7 and 8 provide the validated analytical results of groundwater monitoring for this period. Figures 1 through 3 show the Locations of Wells and Onsite Groundwater Remedy, ONCT Groundwater Extraction and Treatment System Site Plan, and the ONCT Groundwater Extraction and Treatment System Schematic, respectively.

Please contact us if you have any questions or comments.

Sincerely,

Arcadis of New York, Inc.

David E. Stern
Senior Hydrogeologist

Christopher Engler, P.E. 069748
Engineer of Record

Copies:

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TABLES

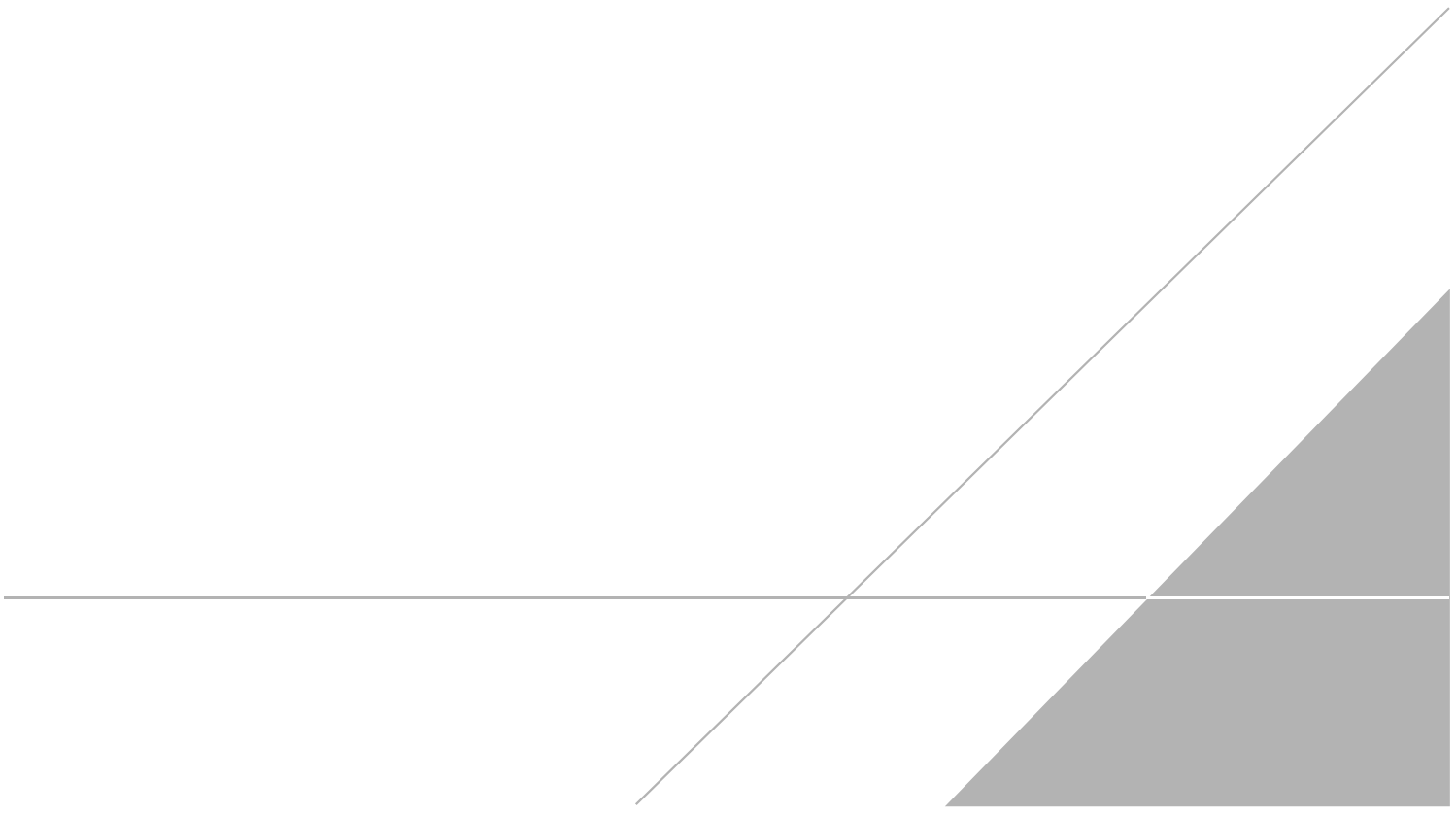

Table 1
Operational Summary for the On-Site Portion of the OU2 Groundwater Remedy, Second Quarter 2017[1]
Operable Unit 2, Northrop Grumman Systems Corporation,
Bethpage, New York

	Quarterly Flow Rates (gpm)		Quarterly Flow Volumes (MG)			Quarterly VOC Concentrations (µg/L)		VOC Mass Removed (lbs) [7]	
	Design [2]	Average [3,4]	Design [2]	Actual [3,4]	% of Design	TCE [5]	TVOC [5,6]	Quarterly	Cumulative
Influent Groundwater									
Well 1 [11,12]	800	803	104.8	105.0	100%	622	660	579	44,836
Well 3R [11,12]	700	696	91.7	91.0	99%	397	440	335	89,947
Well 17 [11]	1,000	1,007	131.0	131.0	100%	116	150	164	52,787
Well 18 [11,12]	600	801	78.6	104.0	132%	45	67	58	6,292
Well 19 [11,12]	700	704	91.7	91.0	99%	132	160	122	8,212
Total [13]	**3,800**	**4,011**	**498**	**522**	**105%**	**--**	**--**	**1,258**	**202,074**
Effluent Groundwater [8]									
Calpine	100 - 400	204	--	26.8	--	--	--	--	--
OXY Biosparge [10]	2 - 42	0	--	0	--	--	--	--	--
West Recharge Basins	1,112 - 1,455	1,519	--	199.0	--	--	0.0	--	--
South Recharge Basins	2,231	2,259	292.4	296.0	101%	--	1.8	--	--
Total [14]	**--**	**3,982**	**--**	**522**	**--**				
Additional Flow to South Recharge Basins									
Storm Water Runoff Contributing to South Recharge Basins Flow Volume [14]	--	--	--	26.9	--	--	--	--	--
Total Flow Volume to South Recharge Basins [14,15]			**292**	**323**	**111%**				

Treatment Efficiencies [9]	
Tower 96 System:	>99.9%
Tower 102 System:	>99.9%

Notes and abbreviations on last page.

Table 1
Operational Summary for the On-Site Portion of the OU2 Groundwater Remedy, Second Quarter 2017[(1)]
Operable Unit 2, Northrop Grumman Systems Corporation,
Bethpage, New York

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Notes and Abbreviations:

(1) Quarterly reporting period: April 03, 2017 through July 03, 2017.
(2) "Design" flow rates were determined for the five remedial wells and for the South Recharge Basins based on computer modeling (ARCADIS G&M, Inc. 2003c, modified in April 2005). Flow rates for Calpine, OXY Biosparge and West Recharge Basins are typical flow rates and are provided for reader information. "Design" flow volumes represent the volume of water that should be pumped/discharged during the reporting period and is calculated by multiplying the design rate by the reporting period duration
(3) "Average" flow rates for the remedial wells represent the average actual pumping rates when the pumps are operational and do not take into account the time that a well is not operational. During this quarterly reporting period, the remedial wells operated for the following percentage of the time: Well 1 (99.7%), Well 3R (99.7%), Well 17 (99.3%), Well 18 (99.1%), and Well 19 (98.6%). "Actual" volumes are determined via totalized values computed by SCADA using the instantaneous flow rates transmitted from local flow meters .
(4) "Average" flow rates for the system discharges represent the average flow rate during the entire reporting period and are determined by dividing the total flow during the reporting period by the reporting period duration. The Calpine and South Recharge Basins flow volumes are determined via totalized values computed by SCADA using the instantaneous flow rates transmitted from local flow meters . The West Recharge Basin flow is calculated by subtracting the cumulative flow to the other discharges from the total influent flow. Actual flow to the recharge basins is greater, as shown, because storm water combines with the plant effluent prior to discharge to the recharge basins.
(5) The TCE and TVOC concentrations for the remedial wells are from the quarterly sampling events performed during this reporting period on June 27, 2017 and June 29, 2017 (Table 2).
(6) The TVOC concentration for the two sets of recharge basins are their respective average monthly SPDES concentration for the current quarter.
(7) TVOC mass removed for the reporting period is calculated by multiplying the TVOC concentration from the quarterly sampling event and the quantity of water pumped during the reporting period.
(8) There are four discharges for the effluent groundwater: South Recharge Basins, West Recharge Basins, Calpine and OXY Biosparge system. Treated water is continuously discharged to the south and west recharge basins, and is available "on-demand" to both the Calpine Power Plant (Calpine) for use as make-up water, and the biosparge remediation system operated by Occidental Chemical (OXY Biosparge).
(9) Treatment System Efficiencies are calculated by dividing the difference between the remedial well flow weighted influent and effluent TVOC concentrations by the remedial well flow weighted influent concentration.
(10) Occidental Chemical has not reported any water usage for the OXY Biosparge system since May 2016.
(11) The majority of downtime during Second Quarter 2017 was due to: a) a compressed air pressure issue at Tower 102, the compressor was serviced and the issue was resolved b) Tower 96 Wet Well pumps were experiencing intermittent shutdowns and upon troubleshooting, controls issues were identified and a starter was replaced. Further controls updates will be undertaken but, the pumps are operating satisfactorily.
(12) On April 3, 2017 the pumping rates associated with three remedial wells were increased slightly following the temporary phase of recharge basin rehabilitation work. The pumping rates were increased at Well 1 (760 to 810 gpm), Well 17 (999 to 1012 gpm) and Well 19 (660 to 700 gpm). The wells continued to operate at these pumping rates through the end of the Second Quarter 2017. On June 30, 2017, the pumping rate was decreased at Well 18 (810 to 605 gpm) due to increased rainfall and to accommodate draining the western most of the South Basins for a comprehensive basin scraping and rehabilitation work.
(13) Total pumpage/recharge rates are accurate to ±15% due to limitations in metering. Flow meter calibration was completed on September 29, 2016.
(14) Storm Water Runoff Volume is calculated by multiplying the adjusted tributary area and NOAA precipitation data for the reporting periods. The adjusted tributary area is tributary area that is adjusted by the runoff coefficient to exclude the infiltration volume from the total rainfall volume. The tributary area, runoff coefficient, and adjusted tributary area are from Dvirka and Bartilucci Consulting Engineers' Storm Water Permit Evaluation Report (January, 28, 2010). The NOAA precipitation data are calculated as a sum of NOAA daily precipitation data for the reporting period. NOAA precipitation data are retrieved from Station GHCND:USW00054787 - FARMINGDALE REPUBLIC AIRPORT, NY US.
(15) Total Flow Volume to South Recharge Basins is estimated as a sum of flow volumes contributed from the Effluent Groundwater to South Recharge Basins and from Storm Water Runoff to South Recharge Basins.

--	not applicable	SCADA	Supervisory Controls and Data Acquisition
µg/L	micrograms per liter	SPDES	State Pollution Discharge Elimination System
gpm	gallons per minute	TCE	trichloroethene
lbs	pounds	TVOC	total volatile organic compounds
MG	million gallons	VOC	volatile organic compounds

Table 2
Concentrations of Constituents in Remedial Wells and Treatment System Effluents, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituents (units in µg/L)	Location ID: / Sample ID: / Sample Date:	WELL 1 / WELL 1 / 6/27/2017	WELL 3R / WELL 3R / 6/27/2017	96 EFFLUENT / T96 EFFLUENT / 6/27/2017
Volatile Organic Compounds (VOCs)[1]				
1,1,1-Trichloroethane		**0.32 J**	**0.61 J**	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0
1,1-Dichloroethane		**0.86 J**	**1.6**	<1.0
1,1-Dichloroethene		**3.3**	**4.8**	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0
1,2-Dichloropropane		**4.7**	<1.0	<1.0
2-Butanone (MEK)		<10	<10	<10
2-Hexanone (MBK)		<5.0	<5.0	<5.0
4-methyl-2-pentanone (MIK)		<5.0	<5.0	<5.0
Acetone		<10	<10	<10
Benzene		<0.50	<0.50	<0.50
Bromodichloromethane		<1.0	<1.0	<1.0
Bromoform		<1.0	<1.0	<1.0
Bromomethane		<2.0	<2.0	<2.0
Carbon Disulfide		<2.0	<2.0	<2.0
Carbon Tetrachloride		<1.0	<1.0	<1.0
Chlorobenzene		<1.0	<1.0	<1.0
Chloroethane		<1.0	<1.0	<1.0
Chloroform		**0.32 J**	<1.0	<1.0
Chloromethane		<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**5.7**	**4.6**	<1.0
cis-1,3-Dichloropropene		<1.0	<1.0	<1.0
Dibromochloromethane		<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0
Methylene Chloride		<2.0	<2.0	<2.0
Styrene		<1.0	<1.0	<1.0
Tetrachloroethene		**22.4**	**27.1**	<1.0
Toluene		<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0	<1.0
Trichloroethylene		**622**	**397**	<1.0
Trichlorotrifluoroethane (Freon 113)		**4.1 J**	**3.8 J**	<5.0
Vinyl Chloride		<1.0	**3.5**	<1.0
Xylene-o		<1.0	<1.0	<1.0
Xylene-m,p		<1.0	<1.0	<1.0
Total VOCs[3]		**660**	**440**	0
1,4-Dioxane[1]		**9.78**	**15.8**	**10.9**

Notes and abbreviations on last page.

Table 2
Concentrations of Constituents in Remedial Wells and Treatment System Effluents, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

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Constituents (units in µg/L)	Location ID: / Sample ID: / Sample Date:	WELL 17 / WELL 17 / 6/29/2017	WELL 18 / WELL 18 / 6/27/2017	Well 18 / REP-061717-JB-1 / 6/27/2017	WELL 19 / WELL 19 / 6/27/2017	102 EFFLUENT / T102 EFFLUENT / 6/27/2017
Volatile Organic Compounds (VOCs)[1]						
1,1,1-Trichloroethane		<1.0	**0.44 J**	**0.57 J**	**0.30 J**	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**0.95 J**	**1.3**	**1.5**	**0.76 J**	<1.0
1,1-Dichloroethene		**1.8**	**4.0**	**4.4**	**1.9**	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	**0.34 J**	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)		<10	<10	<10	<10	<10
2-Hexanone (MBK)		<5.0	<5.0	<5.0	<5.0	<5.0
4-methyl-2-pentanone (MIK)		<5.0	<5.0	<5.0	<5.0	<5.0
Acetone		<10	<10	<10	<10	<10
Benzene		<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane		<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform		<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane		<2.0	<2.0	<2.0	<2.0	<2.0
Carbon Disulfide		<2.0	<2.0	<2.0	<2.0	<2.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform		<1.0	<1.0	<1.0	**0.48 J**	<1.0
Chloromethane		<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**3.0**	**2.7**	**3.3**	**19.4**	<1.0
cis-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane		<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride		<2.0	<2.0	<2.0	<2.0	<2.0
Styrene		<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		**22.0**	**11.9**	**16.7**	**6.0**	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene		**116**	**45.1**	**55.6**	**132**	<1.0
Trichlorotrifluoroethane (Freon 113)		**3.4 J**	**1.4 J**	**1.5 J**	<5.0	<5.0
Vinyl Chloride		<1.0	<1.0	<1.0	<1.0	<1.0
Xylene-o		<1.0	<1.0	<1.0	<1.0	<1.0
Xylene-m,p		<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs[3]		**150**	**67**	**84**	**160**	0
1,4-Dioxane[1]		**7.48[4]**	**7.06**	**7.03**	**5.59**	**6.82**

Notes and abbreviations on last page.

Table 2
Concentrations of Constituents in Remedial Wells and Treatment System Effluents, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

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Notes and Abbreviations:

(1) VOC samples analyzed using USEPA Method 8260C. 1,4-Dioxane samples analyzed using USEPA Method 522 SIM.
(2) Results for the program are validated at 20% frequency, per protocols specified in OU2 Groundwater Monitoring Plan (Arcadis 2016).
(3) Total VOC results rounded to two significant figures.
(4) Well 17 1,4-Dioxane sample collected on June 27, 2017.

1.6 Bold value indicates the constituent was detected at or above its reporting limit.
< 5.0 Compound is not detected above its laboratory quantification limit .
µg/L micrograms per liter
J Constituent value is estimated
OU2 Operable Unit 2
REP blind replicate sample
SIM selective ion monitoring
VOC volatile organic compound
USEPA United Stated Environmental Protection Agency

Table 3
Vapor Sample Analytical Results for Treatment Systems, Second Quarter 2017, Northrop Grumman Systems Corporation, Operable Unit 2, Bethpage, New York[3]

Location ID: / Sample ID: / Date: / Constituents (Units in µg/m^3)	96 INFLUENT T96 INFLUENT 4/14/2017	96 EFFLUENT T96 EFFLUENT 4/14/2017	96 INFLUENT T96 INFLUENT 5/11/2017	96 MIDTRAIN T96 MIDTRAIN 5/11/2017
Volatile Organic Compounds (VOCs)				
1,1,1-Trichloroethane	<71	<71	<76	<22
1,1,2,2-Tetrachloroethane	<89	<89	<96	<27
1,1,2-Trichloroethane	<71	<71	<76	<22
1,1-Dichloroethane	<110	**73.3 J**	<110	**51.4**
1,1-Dichloroethylene	**105 J**	**133**	**120**	**174**
1,2-Dichloroethane	<110	<100	<110	<32
1,2-Dichloropropane	**75.8 J**	<120	**87.8 J**	**37**
Benzene	<86	<80	<89	<26
Bromodichloromethane	<87	<87	<94	<27
Bromoform	<55	<52	<57	<17
Bromomethane	<100	<97	<110	<31
Carbon disulfide	<84	<78	<87	<25
Carbon tetrachloride	<33	<31	<35	<10
Chlorobenzene	<120	<120	<130	<37
Chloroethane	<71	<66	<74	<21
Chloroform	<130	<120	<140	<39
Chloromethane	<56	<52	<58	<17
cis-1,3-Dichloropropene	<120	<110	<130	<36
Dibromochloromethane	<110	<110	<120	<34
Ethylbenzene	<120	<110	<120	<35
Methylene chloride	<94	<87	<97	<28
Styrene	<110	<110	<120	<34
Tetrachloroethylene	**936**	**<34**	**1,410**	**155**
Toluene	<100	<94	<110	<30
trans-1,3-Dichloropropene	<120	<110	<130	<36
Trichloroethylene	**18,200**	**16,600**	**21,600**	**4,800**
Trichlorotrifluoroethane (Freon 113)	**117**	**284**	**130**	**139**
Vinyl chloride	**49.1**	**49.6**	**50.6**	**85.4**
Xylene-o	<120	<110	<120	<35
Xylenes - m,p	<120	**61.2 J**	<120	<35
Total VOCs[2]	**19,483**	**17,201**	**23,398**	**5,442**

Notes and abbreviations on last page.

Table 3
Vapor Sample Analytical Results for Treatment Systems, Second Quarter 2017, Northrop Grumman Systems Corporation, Operable Unit 2, Bethpage, New York[3]

Location ID: / Sample ID: / Date: / Constituents (Units in µg/m^3)	96 INFLUENT / T96 INFLUENT / 6/30/2017	96 MIDTRAIN / T96 MIDTRAIN / 6/27/2017	96 EFFLUENT / T96 EFFLUENT / 6/27/2017	102 INFLUENT / T102 INFLUENT / 6/30/2017	102 EFFLUENT / T102 EFFLUENT / 6/30/2017
Volatile Organic Compounds (VOCs)					
1,1,1-Trichloroethane	<76	<11	**3.2**	**39**	<5.5
1,1,2,2-Tetrachloroethane	<96	<14	<0.69	<27	<6.9
1,1,2-Trichloroethane	<76	<11	<0.55	<22	<5.5
1,1-Dichloroethane	<110	**30**	**36**	**78.9**	<8.1
1,1-Dichloroethylene	**86.4 J**	**103**	**111**	**164**	**48.4**
1,2-Dichloroethane	<110	<16	**1.5**	<32	**9.7**
1,2-Dichloropropane	**73.0 J**	**18 J**	<0.92	<37	<9.2
Benzene	<86	<13	**16**	**23 J**	**83.1**
Bromodichloromethane	<94	<13	<0.67	<27	<6.7
Bromoform	<56	<8.3	<0.41	<17	<4.1
Bromomethane	<100	<16	<0.78	<31	<7.8
Carbon disulfide	<84	<12	<0.62	<25	<6.2
Carbon tetrachloride	<34	<5.0	**0.75**	<10	<2.5
Chlorobenzene	<120	<18	<0.92	<37	<9.2
Chloroethane	<71	<11	**4.0**	<21	<5.3
Chloroform	<130	<20	**10**	**26 J**	<9.8
Chloromethane	<56	<8.3	**3.1**	<17	<4.1
cis-1,3-Dichloropropene	<120	<18	<0.91	<36	<9.1
Dibromochloromethane	<120	<17	<0.85	<34	<8.5
Ethylbenzene	<120	<17	<0.87	<35	**11**
Methylene chloride	<94	<14	**1.1**	<28	<6.9
Styrene	<110	<17	<0.85	<34	<8.5
Tetrachloroethylene	**909**	**63**	**2.2**	**584**	**6.2**
Toluene	**31 J**	<15	**39.2**	<30	**6.8 J**
trans-1,3-Dichloropropene	<120	<18	<0.91	<36	<9.1
Trichloroethylene	**19,700**	**4,030**	**591**	**5,480**	**15**
Trichlorotrifluoroethane (Freon 113)	**124**	**71**	**87.4**	**168**	**7.4 J**
Vinyl chloride	**50.4**	**51.6**	**55.5**	<4.1	<1.0
Xylene-o	<120	<17	<0.87	<35	<8.7
Xylenes - m,p	<120	<17	<0.87	<35	<8.7
Total VOCs[2]	**20,974**	**4,367**	**962**	**6,563**	**188**

Notes and abbreviations on last page.

Table 3
Vapor Sample Analytical Results for Treatment Systems, Second Quarter 2017, Northrop Grumman Systems Corporation, Operable Unit 2, Bethpage, New York[3]

ARCADIS Design & Consultancy for natural and built assets

Notes and Abbreviations:

(1)	Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15.
(2)	"Total VOCs" represents the sum of individual concentrations of compounds detected rounded to the nearest whole number.
(3)	T96 Effluent Sample (96 Effluent) resuts for May 11, 2017 were validated and results were rejected based on the use of non-dedicated sample collection fittings.
µg/m^3	micrograms per cubic meter
120	Bold data indicates that the analyte was detected at or above its reporting limit.
ELAP	Environmental Laboratory Approval Program
J	Compound detected below its reporting limit; value is estimated.
NYSDOH	New York State Department of Health
SUP	Supplemental
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound

Table 4A
Summary of AERMOD Air Quality Impact Analysis
Tower 96 Treatment System, Operable Unit 2,
Northrop Grumman Systems Corporation,
Bethpage, New York

Constituent	CAS#	T96 Effluent (ug/m^3)	Emission Rate[1]			Scaled Impact - Hourly [2] (ug/m^3)	Scaled Impact - Annual [2] (ug/m^3)	SGC [3] (ug/m^3)	AGC[3] (ug/m^3)	%SGC	% AGC
		6/27/2017	lb/yr	lb/hr	g/s						
1,1,1 - Trichloroethane	00071-55-6	**3.2**	0.53	6.0E-05	7.6E-06	1.1E-03	3.3E-05	9000	5000	0.0%	0.0%
1,1 - Dichloroethane	00075-34-3	**36**	5.9	6.8E-04	8.5E-05	1.3E-02	3.7E-04	NS	0.63	--	0.1%
1,2 - Dichloroethane	00107-06-2	**1.5**	0.25	2.8E-05	3.6E-06	5.3E-04	1.5E-05	NS	0.038	--	0.0%
1,1 - Dichloroethylene	00075-35-4	**111**	18.3	2.1E-03	2.6E-04	3.9E-02	1.1E-03	NS	0.63	--	0.2%
Tetrachloroethylene	00127-18-4	**2.2**	0.36	4.1E-05	5.2E-06	7.7E-04	2.3E-05	300	4.0	0.0%	0.0%
Trichloroethylene	00079-01-6	**591**	97	1.1E-02	1.4E-03	2.1E-01	6.1E-03	20	0.20	1.0%	3.0%
Vinyl Chloride	00075-01-4	**55.5**	9.1	1.0E-03	1.3E-04	1.9E-02	5.7E-04	180000	0.11	0.0%	0.5%
Benzene	00071-43-2	**16**	2.6	3.0E-04	3.8E-05	5.6E-03	1.6E-04	1300	0.13	0.0%	0.1%
Toluene	00108-88-3	**39.2**	6.5	7.4E-04	9.3E-05	1.4E-02	4.0E-04	37000	5000	0.0%	0.0%
Carbon Tetrachloride	00056-23-5	**0.75**	0.12	1.4E-05	1.8E-06	2.6E-04	7.7E-06	1900	0.17	0.0%	0.0%
Chloroethane	00075-00-3	**4.0**	0.66	7.5E-05	9.5E-06	1.4E-03	4.1E-05	NS	10000	--	0.0%
Chloroform	00067-66-3	**10**	1.6	1.9E-04	2.4E-05	3.5E-03	1.0E-04	150	14.7	0.0%	0.0%
Chloromethane	00074-87-3	**3.1**	0.51	5.8E-05	7.4E-06	1.1E-03	3.2E-05	22000	90	0.0%	0.0%
Methylene Chloride	00075-09-2	**1.1**	0.18	2.1E-05	2.6E-06	3.9E-04	1.1E-05	14000	60	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	00076-13-1	**87.4**	14	1.6E-03	2.1E-04	3.1E-02	9.0E-04	960000	180000	0.0%	0.0%

Notes and abbreviations on last page.

Table 4A
Summary of AERMOD Air Quality Impact Analysis
Tower 96 Treatment System, Operable Unit 2,
Northrop Grumman Systems Corporation,
Bethpage, New York

Notes and Abbreviations:

(1) Emission rate calculated based on effluent concentration and a stack air flow rate of 4,990 cfm. The stack air flow rate (in acfm) is taken from the actual stack air flow rate on the day of sampling. Effluent temperature used in the model was 96°F from direct read in-line gauge.
Trichloroethene (lb/hr) = TCE [ug/m^{3}] x Air Flow Rate [ft^3/min] x (1 m^3/35 ft^3) x (60 min/hr) x (0.000001 g/1 ug) x (0.0022 lb/g)
lb/yr = lb/hr x 8,760 hrs/yr
g/s = lb/hr x 1 hr/3,600 sec x 453.59 g/1 lb

(2) Ambient impact based on AERMOD modeling using noramalized rate of 1 g/s is scaled to the actual emission rate of the pollutant. Modeling was performed using the representative meteorological data from the nearest station (Farmingdale, NY) for the years 2011 through 2015, and a stack which is 55 feet high and 20 inches in diameter. The maximum impact from all the years was used for the calculations.
Scaled hourly impact (ug/m^3) = AERMOD predicted hourly ambient impact at 1 g/s ([ug/m^3]/[g/s]) x Actual emission rate (g/s)
Scaled annual impact (ug/m^3) = AERMOD predicted annual ambient impact at 1 g/s ([ug/m^3]/[g/s]) x Actual emission rate (g/s)

AERMOD Normalized Ambient Impact at 1 g/s	
Hourly ([ug/m^3]/[g/s])	Annual ([ug/m^3]/[g/s])
148.05	4.35

(3) Short-term and annual guideline concentrations for air toxic pollutants specified in the NYSDEC DAR-1 AGC/SGC tables revised August 10, 2016.
(4) The receptor height corresponds to the average inhalation level.

µg/m^3	micrograms per cubic meter
lb/yr	pounds per year
lb/hr	pounds per hour
g/s	grams per second
26	bold value indicates a detection
AGC	annual guideline concentration
SGC	short-term guideline concentration
acfm	actual cubic feet per minute
CAS #	Chemical Abstracts Service Registry Number
DAR-1	Division of Air Resources-1
NS	none specified
NYSDEC	New York State Department of Environmental Conservation

Table 4B
Summary of AERMOD Air Quality Impact Analysis
Tower 102 Treatment System, Operable Unit 2,
Northrop Grumman Systems Corporation,
Bethpage, New York

Constituent	CAS#	T102 Effluent (ug/m^3)	Emission Rate[1]			Scaled Impact -Hourly[2] (ug/m^3)	Scaled Impact -Annual[2] (ug/m^3)	SGC[3] (ug/m^3)	AGC[3] (ug/m^3)	%SGC	% AGC
		6/30/2017	lb/yr	lb/hr	g/s						
1,2 - Dichloroethane	00107-06-2	**9.7**	2.58	2.9E-04	3.7E-05	1.3E-02	8.5E-05	NS	0.038	--	0.2%
1,1 - Dichloroethene	00075-35-4	**48.4**	12.87	1.5E-03	1.9E-04	6.5E-02	4.2E-04	NS	200	--	0.0%
Tetrachloroethene	00127-18-4	**6.2**	1.65	1.9E-04	2.4E-05	8.3E-03	5.4E-05	300	4.0	0.0%	0.0%
Trichloroethene	00079-01-6	**15**	3.99	4.6E-04	5.7E-05	2.0E-02	1.3E-04	20	0.20	0.1%	0.1%
Benzene	00071-43-2	**83**	22.10	2.5E-03	3.2E-04	1.1E-01	7.3E-04	1300	0.13	0.0%	0.6%
Toluene	00108-88-3	**6.8**	1.81	2.1E-04	2.6E-05	9.1E-03	5.9E-05	37000	5000	0.0%	0.0%
Ethylbenzene	00100-41-4	**11**	2.93	3.3E-04	4.2E-05	1.5E-02	9.6E-05	--	1000	--	0.0%
Trichlorotrifluoroethane (Freon 113)	00076-13-1	**7.4**	1.97	2.2E-04	2.8E-05	9.9E-03	6.5E-05	960000	180000	0.0%	0.0%

Notes and abbreviations on last page.

Table 4B
Summary of AERMOD Air Quality Impact Analysis
Tower 102 Treatment System, Operable Unit 2,
Northrop Grumman Systems Corporation,
Bethpage, New York

Notes and Abbreviations:

(1) Emission rate calculated based on effluent concentration and a stack air flow rate of 8,050 cfm. The stack air flow rate (in acfm) is taken from the actual stack air flow rate on the day of sampling. Effluent temperature used in the model was 71°F from direct read in-line gauge.
Trichloroethene (lb/hr) = TCE [ug/m^{3}] x Air Flow Rate [ft^3/min] x (1 m^3/35 ft^3) x (60 min/hr) x (0.000001 g/1 ug) x (0.0022 lb/g)
lb/yr = lb/hr x 8,760 hrs/yr
g/s = lb/hr x 1 hr/3,600 sec x 453.59 g/1 lb

(2) Ambient impact based on AERMOD modeling using noramalized rate of 1 g/s is scaled to the actual emission rate of the pollutant. Modeling was performed using the representative meteorological data from the nearest station (Farmingdale, NY) for the years 2011 through 2015, and a stack which is 69.52 feet high and 24 inches in diameter. The maximum impact from all the years was used for the calculations.
Scaled hourly impact (ug/m^3) = AERMOD predicted hourly ambient impact at 1 g/s ([ug/m^3]/[g/s]) x Actual emission rate (g/s)
Scaled annual impact (ug/m^3) = AERMOD predicted annual ambient impact at 1 g/s ([ug/m^3]/[g/s]) x Actual emission rate (g/s)

AERMOD Normalized Ambient Impact at 1 g/s	
Hourly ([ug/m^3]/[g/s])	Annual ([ug/m^3]/[g/s])
348.85	2.29

(3) Short-term and annual guideline concentrations for air toxic pollutants specified in the NYSDEC DAR-1 AGC/SGC tables revised August 10, 2016.
(4) The receptor height corresponds to the average inhalation level.

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
acfm	actual cubic feet per minute
ft^3 /min of cfm	cubic feet per minute
g/s	grams per second
lb/hr	pounds per hour
lb/yr	pounds per year
9.7	bold value indicates a detection
AGC	annual guideline concentration
CAS #	Chemical Abstracts Service Registry Number
DAR-1	Division of Air Resources-1
NS	none specified
NYSDEC	New York State Department of Environmental Conservation
SGC	short-term guideline concentration

Table 5
Summary of TCE Mass Removal, Tower 96 Treatment System,
Second Quarter 2017, Northrop Grumman Systems Corporation,
Operable Unit 2, Bethpage, New York[1,2,3]

Date	TCE Concentration (µg/m^3)				TCE Mass Emission[5] (lbs)	Percent of Allowable TCE Emissions[6]		Percent Mass Removal		
	T96 INFLUENT	T96 MIDTRAIN	T96 SUP MIDTRAIN	T96 EFFLUENT[7]		Period	Rolling	T96 MIDTRAIN	T96 SUP MIDTRAIN	T96 EFFLUENT
1/1/2015										
3/16/2015	36,420	7,450	NS	675	22	21.3%	--	79.5%	NA	98.1%
5/11/2015	25,154	7,308	NS	56	1.4	1.8%	--	70.9%	NA	99.8%
9/9/2015	32,252	8,807	NS	149	7.8	4.7%	--	72.7%	NA	99.5%
12/15/2015	22,963	6,087	NS	129	5.4	4.1%	--	73.5%	NA	99.4%
3/14/2016	24,892	4,311	NS	50	1.9	1.6%	3.3%	82.7%	NA	99.8%
5/12/2016	25,539	7,455	NS	49	1.2	1.5%	3.3%	70.8%	NA	99.8%
8/17/2016	24,787	4,232	NS	34	1.4	1.1%	2.1%	82.9%	NA	99.9%
12/22/2016	29,031	4,018	NS	161	8.4	4.8%	2.5%	86.2%	NA	99.4%
2/14/2017 (2)	24,300	NS	142	42	1.0	1.4%	2.6%	NA	99.4%	99.8%
3/21/2017	23,800	NS	2,580	1,280	20	42%	6.3%	NA	89.2%	94.6%
4/14/2017 (3)	18,200	NS	NS	16,600	184	561%	39.9%	NA	NA	8.8%
5/11/2017 (7)	21,600	4,800	NS	4,800	55	148%	54.2%	77.8%	NA	77.8%
6/27/2017 (4,8)	19,700	4,030	NS	591	13	20%	65.4%	79.5%	NA	97.0%

Notes and Abbreviations:

(1) Vapor samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15.

(2) System transitioned from a regenerative VPGAC to once-through VPGAC (Supplemental Bed 1) system with PPZ polishing bed (Supplemental Bed 2) on 1/26/2017. Northrop Grumman performed pilot testing on this operational modification as discussed with NYSDEC on January 26, 2017.

(3) PPZ media was removed from the Supplemental Bed 2 on 3/23/2017 by OXY and was left empty.

(4) A carbon change out was performed in Supplemental Bed 1 and new carbon was placed in the previously empty Supplemental Bed 2 on May 18, 2017.

(5) TCE Mass Emission calculated based on the exhaust air flow rate on the day of sampling and the period of time since the preceding day of sampling.
TCE (lb) = TCE Concentration [µg/m^3] x Days x Flow Rate [ft^3/min] x (1 m^3/35 ft^3) x (60 min/hr) x (24 hr/day) x (0.000001 g/1 ug) x (0.0022 lb/g)

(6) Percent of allowable TCE emissions to date is a time-weighted annual rolling average based on the 500 lb/year emission limit specified in the CRR-NY 212-2.2 Table 2. High Toxicity Air Contaminant List, revised April 1, 2017.

(7) For calculation purposes, the T96 MIDTRAIN concentration was used for the T96 Effluent result for May 11, 2017 as the T96 Effluent sample results were validated and rejected based on the use of non-dedicated sample collection fittings.

(8) T96 Influent sample collected on 6/30/2017.

italics dates of pilot test using once through carbon treatment operation.
µg/m^3 micrograms per cubic meter
lbs pounds
CRR-NY Codes, Rules and Regulations of the State of New York
ELAP Environmental Laboratory Approval Program
NA not applicable
NS not sampled
NYSDOH New York State Department of Health
PPZ potassium permanganate coated zeolite
SUP supplemental
TCE trichloroethylene
USEPA United States Environmental Protection Agency
VOC volatile organic compound
VPGAC vapor phase granulated activated carbon

Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	FW-03 / FW-03 / 4/20/2017	GM-13D / GM-13D / 4/17/2017	GM-15SR / GM-15SR / 6/28/2017	GM-15I / GM-15I / 6/28/2017	GM-15D / GM-15D / 6/28/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	**0.74 J**	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	**4.4**	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		< 1.0	**3.5**	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	**5.5**	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		**1.6**	**45.6**	< 1.0	< 1.0	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**0.71 J**	**23.0**	**11.1**	**2.1**	< 1.0
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**2.3**	**83**	**11**	**2.1**	0
1,4 Dioxane [1,2]		**1.04**	**4.85**	< 0.200	**0.415**	**4.14**

See notes on last page

Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-15D2 / GM-15D2 / 6/28/2017	GM-17I / GM-17I / 5/2/2017	GM-17D / GM-17D / 5/2/2017	GM-18I / GM-18I / 7/11/2017	GM-18D / GM-18D / 4/21/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		**0.37 J**	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		**0.95 J**	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		**6.2**	< 1.0	< 1.0	< 1.0	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**10**	< 1.0	**0.83 J**	**0.96 J**	**0.52 J**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**18**	0	**0.8**	**1.0**	**0.5**
1,4 Dioxane [1,2]		< 0.200	**9.18**	**11.5**	**13.7**	**15.2**

See notes on last page

Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-20I / GM-20I / 4/25/2017	GM-20D / GM-20D / 4/25/2017	GM-21S / GM-21S / 6/21/2017	GM-21I / GM-21I / 4/26/2017	GM-21D / GM-21D / 5/3/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**0.68 J**	**1.0**	**0.42 J**	**0.67 J**	**1.5**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**0.7**	**1.0**	**0.4**	**0.7**	**1.5**
1,4 Dioxane [1,2]		**6.51**	**6.24**	**4.55**	**6.73**	**5.66**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-21D2 / GM-21D2 / 5/19/2017	GM-33D2 / GM-33D2 / 6/12/2017	GM-34D / GM-34D / 6/26/2017	GM-34D2 / GM-34D2 / 6/26/2017	GM-35D2 / GM-35D2 / 4/24/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		**0.22 J**	< 1.0	**0.51 J**	< 1.0	< 1.0
1,1-Dichloroethene		**0.58 J**	< 1.0	**2.2**	**0.73 J**	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	**0.42 J**	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		**0.62 J**	< 1.0	**8.8**	**1.8**	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		**4.0**	**3.8**	**7.7**	**6.6**	**6.0**
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**21.0**	**16.3**	**299**	**110**	**38.4**
Trichlorotrifluoroethane (Freon 113)		< 5.0	**6.4**	**2.1 J**	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**26**	**27**	**320**	**120**	**44**
1,4 Dioxane [1,2]		**5.47 J**	**14.3**	**24.4**	**15.3**	**9.61**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-36D / GM-36D / 6/19/2017	GM-36D2 / GM-36D2 / 6/19/2017	GM-37D / GM-37D / 7/11/2017	GM-37D / REP071117AD1 / 7/11/2017	GM-37D2 / GM-37D2 / 7/5/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	**0.45 J**	< 1.0	< 1.0	**0.45 J**
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	**0.92 J**	**0.29 J**	**0.30 J**	**1.5**
1,1-Dichloroethene		< 1.0	**0.89 J**	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		< 1.0	**3.0**	**8.0**	**7.8**	**1.6**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		0	**5.3**	**8.3**	**8.1**	**3.6**
1,4 Dioxane [1,2]		**2.07**	**3.97**	**0.693**	**0.651**	**1.26**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-38D / GM-38D / 5/1/2017	GM-38D / REP-050117AD1 / 5/1/2017	GM-38D2 / GM-38D2 / 5/2/2017	GM-39DA / GM-39DA / 5/3/2017	GM-39DB / GM-39DB / 5/3/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		**0.36 J**	**0.32 J**	**0.96 J**	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	**0.38 J**	< 1.0	< 1.0
1,1-Dichloroethane		**0.64 J**	**0.63 J**	**1.8**	< 1.0	< 1.0
1,1-Dichloroethene		**0.69 J**	**0.64 J**	**1.8**	< 1.0	< 1.0
1,2-Dichloroethane		**0.44 J**	**0.45 J**	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	**0.35 J**	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		**0.54 J**	**0.52 J**	**2.4**	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		**5.8**	**5.7**	< 1.0	< 1.0	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**85.7**	**86.2**	**306 D**	**1.6**	**34.0**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	**1.4 J**	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**94**	**94**	**315**	**1.6**	**34**
1,4 Dioxane [1,2]		**3.64**	**4.52**	**4.24**	**5.42**	**5.88**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-70D2 / GM-70D2 / 4/24/2017	GM-71D2 / GM-71D2 / 4/26/2017	GM-73D / GM-73D / 6/15/2017	GM-73D2 / GM-73D2 / 4/14/2017	GM-73D3 / GM-73D3 / 6/29/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	**1.7**	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	**5.3**	< 1.0	**0.32 J**	< 1.0
1,1-Dichloroethene		< 1.0	**2.9**	< 1.0	**0.57 J**	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	**0.49 J**	< 1.0	**0.69 J**	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	**0.61 J**	< 1.0	**0.54 J**	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		**2.4**	< 1.0	< 1.0	**2.7**	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**7.8**	**12.1**	**4.4**	**35.7**	**1.5**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**10**	**23**	**4.4**	**41**	**1.5**
1,4 Dioxane [1,2]		**8.49**	**3.12**	**5.38**	**3.20**	**0.976**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-74I / GM-74I / 5/2/2017	GM-74D / GM-74D / 5/2/2017	GM-74D / GM-74D / 5/2/2017	GM-74D2 / GM-74D2 / 4/14/2017	GM-74D3 / GM-74D3 / 7/10/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	< 1.0	< 1.0	**0.42 J**	< 1.0
1,1-Dichloroethene		< 1.0	< 1.0	< 1.0	**0.64 J**	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 1.0	< 1.0	**3.5**	**3.0**
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**0.60 J**	**1.3**	**1.3**	**7.8**	**5.8**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**0.6**	**1.3**	**1.3**	**12**	**8.8**
1,4 Dioxane [1,2]		**4.95**	**6.77**	**6.77**	**4.13**	**3.29**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-74I / GM-74I / 5/2/2017	GM-75D2 / GM-75D2 / 6/12/2017	GM-78S / GM-78S / 6/22/2017	GM-78I / GM-78I / 5/5/2017	GM-78D / GM-78D / 5/4/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10 U	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0 U	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10 U	< 10	< 10	< 10	< 10
Benzene		< 0.50 U	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0 U	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0 U	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0 U	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0 U	**1.0**	< 1.0	**0.24 J**	< 1.0
Toluene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**0.60 J**	**26.4**	**0.43 J**	**0.44 J**	**3.5**
Trichlorotrifluoroethane (Freon 113)		< 5.0 U	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0 U	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**0.6**	**27**	**0.4**	**0.7**	**3.5**
1,4 Dioxane [1,2]		**4.95**	**8.81**	**4.65**	**5.17**	**10.8**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	GM-78D2 / GM-78D2 / 5/4/2017	GM-79I / GM-79I / 6/28/2017	GM-79D / GM-79D / 6/28/2017	HN-24I / HN-24I / 4/20/2017	HN-40S / HN-40S / 4/19/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	**0.45 J**	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	< 1.0	< 1.0	**1.1**	< 1.0
1,1-Dichloroethene		< 1.0	< 1.0	< 1.0	**3.7**	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	**0.60 J**	**0.63 J**
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0	**0.96 J**	**0.53 J**	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 1.0	< 1.0	**15.0**	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		**1.6**	**0.45 J**	**46.9**	**11.2**	< 1.0
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		**1.6**	**0.5**	**48**	**33**	**0.6**
1,4 Dioxane [1,2]		**14.4**	**5.79**	**5.85**	**4.48**	**0.122 J**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Constituent (units in µg/L)	Well ID / Sample ID / Date:	HN-40I / HN-40I / 4/19/2017	HN-42S / HN-42S / 6/22/2017	HN-42I / HN-42I / 4/19/2017	MW-3-1 / MW-3-1 / 7/7/2017	N-10624 / N-10624 / 6/21/2017
Volatile Organic Compounds (VOCs)[1, 2]						
1,1,1-Trichloroethane		< 1.0	< 1.0	< 1.0	**0.63 J**	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	< 1.0	< 1.0	**2.8**	< 1.0
1,1-Dichloroethene		< 1.0	< 1.0	< 1.0	**2.5**	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0	< 1.0	**0.28 J**	< 1.0
2-Butanone		< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	**0.69 J**	< 1.0
Chloroform		< 1.0	< 1.0	< 1.0	**0.52 J**	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	**18.8**	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 1.0	< 1.0	**11.3**	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene		< 1.0	< 1.0	**0.42 J**	**119**	**0.33 J**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0	< 1.0	**29.7**	< 1.0
Xylene-o		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs [3]		0	0	**0.4**	**180**	**0.3**
1,4 Dioxane [1,2]		**0.101 J**	< 0.200	**0.690**	**15.1**	**4.04**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

Constituent (units in µg/L)	Well ID / Sample ID / Date:	N-10627 / N-10627 / 6/21/2017	N-10631 / N-10631 / 6/23/2017
Volatile Organic Compounds (VOCs)[1, 2]			
1,1,1-Trichloroethane		< 1.0	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0
1,1,2-Trichloroethane		< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	< 1.0
1,1-Dichloroethene		< 1.0	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	< 1.0
2-Butanone		< 10	< 10
4-methyl-2-pentanone		< 5.0	< 5.0
Acetone		< 10	< 10
Benzene		< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0
Bromoform		< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0
Carbon tetrachloride		< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0
Chloroform		< 1.0	< 1.0
Chloromethane		< 1.0	< 1.0
cis-1,2-dichloroethene		< 1.0	< 1.0
cis-1,3-dichloropropene		< 1.0	< 1.0
Dibromochloromethane		< 1.0	< 1.0
Ethylbenzene		< 1.0	< 1.0
Methylene Chloride		< 2.0	< 2.0
Styrene		< 1.0	< 1.0
Tetrachloroethene		< 1.0	< 1.0
Toluene		< 1.0	< 1.0
trans-1,2-dichloroethene		< 1.0	< 1.0
trans-1,3-dichloropropene		< 1.0	< 1.0
Trichloroethylene		**0.31 J**	**1.3**
Trichlorotrifluoroethane (Freon 113)		< 5.0	< 5.0
Vinyl Chloride		< 1.0	< 1.0
Xylene-o		< 1.0	< 1.0
Xylenes - m,p		< 1.0	< 1.0
Total VOCs [3]		**0.3**	**1.3**
1,4 Dioxane [1,2]		**5.65**	**6.37 J**

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Table 6
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Monitoring Wells, Second Quarter 2017, Operable Unit 2, Northrop Grumman Systems Corporation, Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Notes and Abbreviations:

(1)	Samples were analyzed for VOCs using USEPA Method 8260 C; samples were analyzed for 1,4-Dioxane using USEPA Method 522.
(2)	Results for the program are validated at 20% frequency, per protocols specified in OU2 Groundwater Monitoring Plan (Arcadis 2016).
(3)	Total VOCs rounded to two significant figures.
Bold	Constituent detected
J	Constituent value is estimated
D	Concentration is based on a diluted sample analysis
REP	Replicate Sample
µg/L	Micrograms per liter
VOCs	Volatile Organic Compounds
<1.0	Compound not detected above its laboratory quanitfication limit.

Table 7
Concentrations of Metals and 1,4-Dioxane in Monitoring Wells[1]
Second Quarter 2017, Operable Unit 2
Northrop Grumman Systems Corporation
Bethpage, New York.

Constituent (units in µg/L)	Well: Sample ID: Date:	GM-15SR GM-15SR 6/28/2017	GM-78S GM-78S 6/22/2017	GM-78I GM-78I 5/5/2017	MW-02GF MW-02GF 6/29/2017	N-10631 N-10631 6/23/2017	PLT1 MW-04 PLT1 MW-04 6/27/2017	PLT1 MW-05 PLT1 MW-05 6/27/2017	PLT1 MW-06 PLT1 MW-06 6/21/2017	PLT1 MW-06 REP062117AD1 6/21/2017
Metals [2]										
Cadmium		--	<3.0	<3.0	<3.0	**6.2**	**--**	--	--	--
Cadmium (Dissolved)		--	<3.0	<3.0	<3.0	**5.2**	**--**	--	--	--
Chromium		**701**	<10	<10	**27.9**	**29.1**	<10	**586**	**189**	**187**
Chromium (Dissolved)		**679**	<10	<10	**27.4**	**18.8**	<10	**583**	**188**	**191**
1,4-dioxane [2,3]		< 0.200	**4.65**	**5.17**	**5.13**	**6.37 J**	**0.104 J**	**0.241**	< 0.200	< 0.200

Notes and Abbreviations:

(1) Monitoring Well MW-1GF could not be sampled during Second Quarter 2017 due to access issues.

(2) Results for the program are validated at 20% frequency, per protocols specified in OU2 Groundwater Monitoring Plan (Arcadis 2016).

(3) Samples were analyzed for 1,4-Dioxane using USEPA Method 522.

Bold Constituent detected

J Constituent value is estimated

REP Blind duplicate sample

µg/L Micrograms per liter

-- Not analyzed

<3.0 Compound not detected above its laboratory quanitfication limit.

Table 8
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Outpost Wells [1]
Second Quarter 2017, Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

Constituents units in (ug/L)	Well ID: Sample ID: Sample Date:	BPOW 1-1 BPOW 1-1 6/19/2017	BPOW 1-2 BPOW 1-2 6/13/2017	BPOW 1-3 BPOW 1-3 6/13/2017	BPOW 1-4 BPOW 1-4 6/12/2017	BPOW 1-5 BPOW 1-5 6/12/2017	BPOW 1-6 BPOW 1-6 6/27/2017	BPOW 2-1 BPOW 2-1 5/10/2017	BPOW 2-2 BPOW 2-2 5/10/2017	BPOW 2-3 BPOW 2-3 5/9/2017
Volatile Organic Constituents [2, 4]										
1,1,1-Trichloroethane		**0.20 J**	**0.23 J**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloropropane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Butanone (MEK)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl N-Butyl Ketone (2-Hexanone)		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-Pentanone		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acetone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromomethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Disulfide		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Tetrachloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorobenzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,3-Dichloropropene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methylene Chloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Styrene (Monomer)		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Tetrachloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,3-Dichloropropene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene		**1.0**	**0.88**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichlorotrifluoroethane (Freon)		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
o-Xylene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
m,p-Xylene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TVOCs [5]		**1.2**	**1.1**	0	0	0	0	0	0	0
1,4 Dioxane [2,4]		**0.100 J**	**0.204**	**0.312**	< 0.200	< 0.200	< 0.200	**1.33**	**0.326**	**3.77**

Table 8
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Outpost Wells [1]
Second Quarter 2017, Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

Constituents units in (ug/L)	BPOW 3-1 BPOW 3-1 7/6/2017	BPOW 3-1 REP070617PP1 7/6/2017	BPOW 3-2 BPOW 3-2 7/6/2017	BPOW 3-3 BPOW 3-3 6/14/2017	BPOW 3-4 BPOW 3-4 6/14/2017	BPOW 4-1R BPOW 4-1R 5/26/2017	BPOW 4-2R BPOW 4-2R 6/20/2017
Volatile Organic Constituents [2, 4]							
1,1,1-Trichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	**0.13 J**	**0.18 J**	< 0.50
1,1,2,2-Tetrachloroethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	**0.79**	< 0.50	< 0.50
1,1-Dichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	**0.21 J**	< 0.50	< 0.50
1,1-Dichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	**1.6**	**1.0**	< 0.50
1,2-Dichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloropropane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Butanone (MEK)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl N-Butyl Ketone (2-Hexanone)	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-Pentanone	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acetone	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromomethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Disulfide	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Tetrachloride	< 0.50	< 0.50	< 0.50	< 0.50	**0.87**	**0.33 J**	< 0.50
Chlorobenzene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform	< 0.50	< 0.50	< 0.50	< 0.50	**1.4**	**0.81**	< 0.50
Chloromethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	**1.2**	< 0.50	< 0.50
cis-1,3-Dichloropropene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methylene Chloride	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Styrene (Monomer)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Tetrachloroethene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,3-Dichloropropene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	**77.3**	**0.84**	**0.60**
Trichlorotrifluoroethane (Freon)	< 1.0	< 1.0	< 1.0	< 1.0	**1.2**	**26.6**	**2.5**
Vinyl chloride	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
o-Xylene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
m,p-Xylene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TVOCs [5]	0	0	0	0	**85**	**30**	**3.1**
1,4 Dioxane [2,4]	**0.811**	**0.794**	**3.49**	**5.63 J**	**4.43**	**2.64**	**0.425**

Table 8
Concentrations of Volatile Organic Compounds and 1,4 Dioxane in Outpost Wells [1]
Second Quarter 2017, Operable Unit 2,
Northrop Grumman Systems Corporation
Bethpage, New York

Notes and Abbreviations:

(1) These outpost wells have been recently repurposed for use as plume monitoring wells per the June 2015 Groundwater Monitoring Plan Addendum (ARCADIS of New York, Inc., 2015) as conditionally approved by the NYSDEC (August 25, 2015). Therefore, TVOC trigger levels that may have been previously established are no longer shown

(2) Samples were analyzed for VOCs using USEPA Method 524.2; samples were analyzed for 1,4-Dioxane using USEPA Method 522

(3) The NAVY abandoned original Wells BPOW4-1 and BPOW4-2 and installed replacement Wells BPOW4-1R and BPOW4-2R between August, 2014 and October, 2014

(4) Results for the program are validated at 20% frequency, per protocols specified in OU2 Groundwater Monitoring Plan (Arcadis 2016)

(5) TVOCs are rounded to two significant figures

Bold value indicates constituent detected.

REP	Blind Duplicate Sample
TVOCs	Total Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
µg/L	micrograms per liter
<0.5	Compound not detected above its laboratory quantification limit.
J	Value is estimated concentration

FIGURES

HWD 10208
HWD 8779
FORMER OXY/RUCO POLYMER SITE
(107)
PLANT 111
PLANT 110
PLANT 115
PLANT 21
PLANT 37
PLANT 35
PLANT 15
PLANT 14
PLANT 26
PLANT 30
BETHPAGE COMMUNITY PARK
NWIRP SITE (FORMER NAVY SITE)
PLANT 12
PLANT 12A
PLANT 3
HN-24I
HN-24S
FW-03
PLANT 10
WT
HN-42S
HN-42I
FARMERS AVENUE
BWD 8768
BWD 8767
HAYPATH ROAD
(PLAINVIEW ROAD)
BETHPAGE COMMUNITY PARK
BETHPAGE HIGH SCHOOL
BWD 9591
GM-13D
GM-16I
GM-16SR
HN-40S
HN-40I
BROADWAY
MW-3-1
WELL 3R
WELL 3
10597
GM-17SR
GM-17I
GM-17D
PLANT 5 BASINS
PLANT 5
OU2 MAIN FACILITY REMEDIAL SYSTEM (TOWER 96)
OU2 MAIN FACILITY REMEDIAL SYSTEM (TOWER 102)
EXISTING OU2 TREATMENT SYSTEMS
MW-1GF
GM-32S
PLANT 2
PLANT 1 FUEL DEPOT AREA
GRUMMAN ROAD
PLANT 1
OU-2 ON-SITE GROUNDWATER REMEDY TREATMENT SYSTEMS
WELL 1
GM-18S
GM-18I
GM-18D
MW-2GF
GM-39DA
GM-39DB
GM-19S
GM-19I
MW-5
MW-4
MW-6
GM-15SR
GM-15I
GM-15D
GM-15D2
GM-73D3
GM-73D2
GM-73D
GM-74I
GM-74D
GM-74D2
GM-74D3
WELL 19
GM-33D2
10631
WELL 18
SOUTH BASINS
WELL 17
10600
GM-78S
GM-78I
GM-78D
GM-78D2
GM-20I
GM-20D
GM-21D2
10633
BLOOMINGDALE ROAD
CENTRAL AVENUE
9921
GM-21S
GM-21I
GM-21D
GM-75D2
10624
10627
GM-79I
GM-79D
10628
LONG ISLAND RAILROAD
GM-37D
GM-37D2
10634
GM-71D2
GM-70D2
GM-35D2
GM-36D
GM-36D2
N-10821
BWD 6915
6916
NORTH WANTAGH AVE.
HICKSVILLE ROAD
STEWART AVENUE
BETHPAGE STATE PARKWAY
SEAFORD - OYSTER BAY EXPRESSWAY
MALLARD ROAD
(GARDINER'S AVENUE)
LOWLAND ROAD
GM-34D
GM-34D2
BWD 8941
3876
GM-38D
GM-38D2
BWD 8004
TOH(LWD) 7076
PIKE
BPOW 1-4
BPOW 1-5
BPOW 1-6
BPOW 1-3
BPOW 1-1
BPOW 1-2
SFWD 7377
SFWD 5148
SFWD 4043
BOUNDARY AVENUE
BPOW 4-2R
BPOW 4-1R
TOH(LWD) 5303
BPOW 2-2
BPOW 2-3
BPOW 2-1
SFWD 6150
BPOW 3-3
BPOW 3-4
BPOW 3-2
BPOW 3-1
NYAW 9338
NYAW 8480
HICKSVILLE

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.

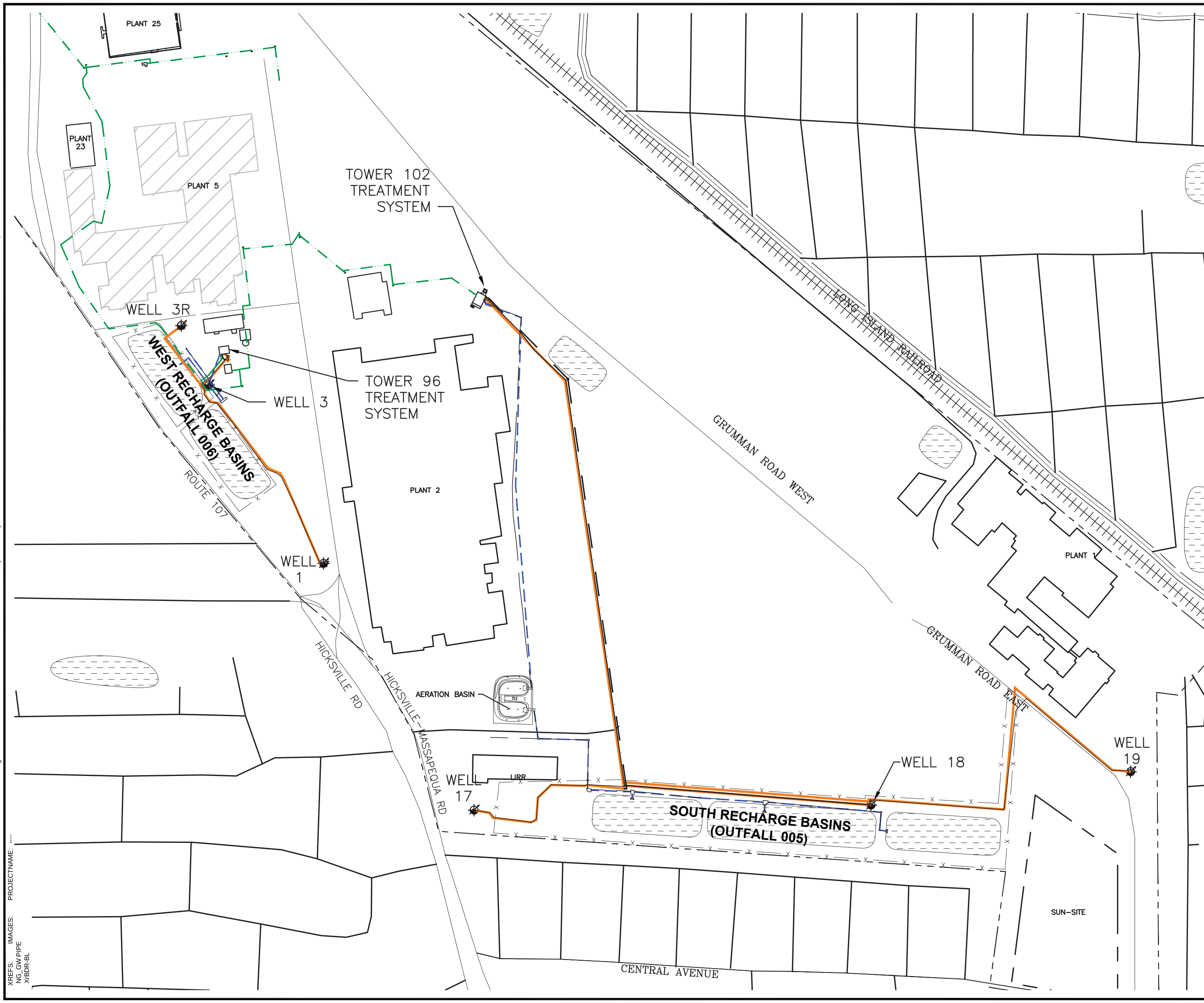
0 1000' 2000'
APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 2

LOCATIONS OF WELLS AND ON-SITE GROUNDWATER REMEDY

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

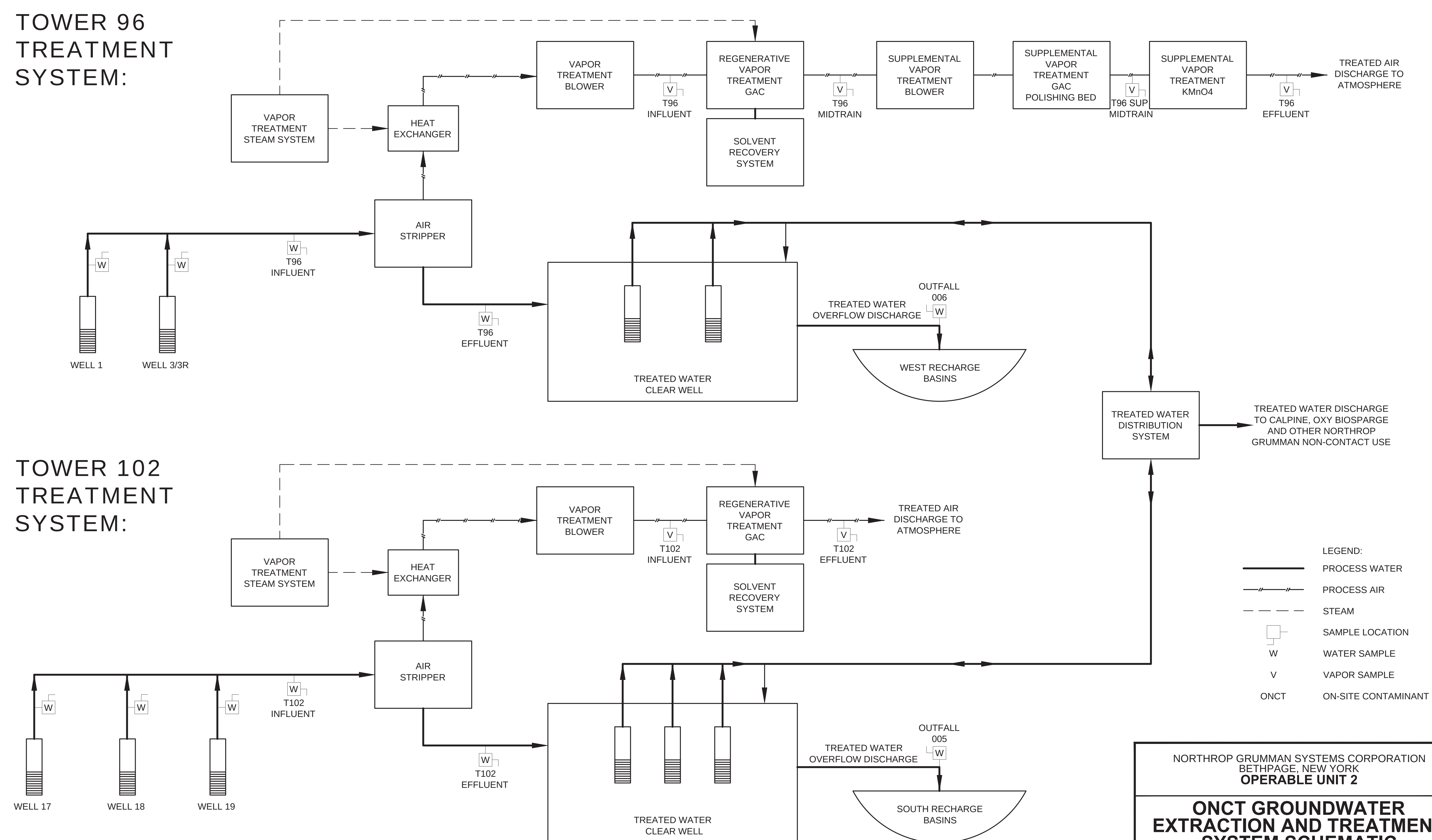


NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 2

ONCT GROUNDWATER EXTRACTION AND TREATMENT SYSTEM SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2


TOWER 96 TREATMENT SYSTEM:
VAPOR TREATMENT STEAM SYSTEM
HEAT EXCHANGER
VAPOR TREATMENT BLOWER
REGENERATIVE VAPOR TREATMENT GAC
SOLVENT RECOVERY SYSTEM
SUPPLEMENTAL VAPOR TREATMENT BLOWER
SUPPLEMENTAL VAPOR TREATMENT GAC POLISHING BED
SUPPLEMENTAL VAPOR TREATMENT KMnO4
TREATED AIR DISCHARGE TO ATMOSPHERE
T96 INFLUENT
T96 MIDTRAIN
T96 SUP MIDTRAIN
T96 EFFLUENT
AIR STRIPPER
WELL 1
WELL 3/3R
TREATED WATER CLEAR WELL
TREATED WATER OVERFLOW DISCHARGE
OUTFALL 006
WEST RECHARGE BASINS
TREATED WATER DISTRIBUTION SYSTEM
TREATED WATER DISCHARGE TO CALPINE, OXY BIOSPARGE AND OTHER NORTHROP GRUMMAN NON-CONTACT USE
TOWER 102 TREATMENT SYSTEM:
T102 INFLUENT
T102 EFFLUENT
WELL 17
WELL 18
WELL 19
OUTFALL 005
SOUTH RECHARGE BASINS
W
V
LEGEND:
PROCESS WATER
PROCESS AIR
STEAM
SAMPLE LOCATION
W WATER SAMPLE
V VAPOR SAMPLE
ONCT ON-SITE CONTAMINANT

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 2

ONCT GROUNDWATER EXTRACTION AND TREATMENT SYSTEM SCHEMATIC

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FIGURE 3