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Date: May 27, 2021
Our Ref: 30059266
Subject: Results of First Quarter 2021 System Operation and Monitoring, Bethpage Park Groundwater Containment System (BPGWCS), Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York, NYSDEC Site #1-30-003A.

Dear Jason,

Enclosed is one electronic PDF copy of the First Quarter 2021 Report for the BPGWCS operation and monitoring, performed in accordance with the NYSDEC-approved OU3 Groundwater IRM OM&M Manual (Arcadis 2009) and the NYSDEC-approved Sampling and Analysis Plan (SAP; Arcadis 2009). As we have transitioned to electronic submittals (via PDF) in line with NYSDEC's paper reduction program, hard copies of the report can be provided on request.

If you have any questions, please do not hesitate to contact me.

Sincerely,
Arcadis of New York, Inc.

Christopher D. Engler

Christopher Engler, PE New York PE-069748
Vice President

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Mr. Jason Pelton
NYSDEC RB
May 27th, 2021

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Table 1
Operational Summary
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

MONTH	DAY																													Days Operational [1]
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
2009 Total																																160
2010 Total																																352
2011 Total																																351
2012 Total																																353
2013 Total																																354
2014 Total																																349
2015 Total																																348
2016 Total																																351
2017 Total																																354
2018 Total																																348
2019 Total																																355
2020 Total																																345
Jan 2021																(2)																31
Feb 2021												(2)				(2)																28
Mar 2021				(2)																												31
1Q 2021																																90
2021 Total																																90
TOTAL																																**4110**

Legend:

Indicates system online the majority or all of the day.
Indicates system operated with reduced flow rates.
Indicates system off-line the majority or all of the day.

Notes, Abbreviations, and Units on last page.

Table 1
Operational Summary
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Notes:

1. Days the system was operational for the majority of the day are counted as one day.

First Quarter 2021

2. ISTR Discharge event.

Abbreviations/Units:

1Q First Quarter

Table 2
Summary of Influent Water Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Compound (All Constituent Concentrations in µg/L)	05/14/20	07/08/20	12/2/2020 (3)	02/10/21
Project VOCs				
1,1,1 - Trichloroethane	< 1.0	< 1.0	NS	< 1.0
1,1 - Dichloroethane	< 1.0	< 1.0	NS	< 1.0
1,2 - Dichloroethane	< 1.0	< 1.0	NS	< 1.0
1,1 - Dichloroethene	< 1.0	< 1.0	NS	< 1.0
Tetrachloroethene	< 1.0	< 1.0	NS	< 1.0
Trichloroethene	**4.5**	**3.7**	NS	**3.8**
Vinyl Chloride	**4.1**	**4.5**	NS	**3.6**
cis 1,2-Dichloroethene	**9.8**	**9.2**	NS	**13.2**
trans 1,2-Dichloroethene	< 1.0	< 1.0	NS	< 1.0
Benzene	< 0.50	< 0.50	NS	< 0.50
Toluene	< 1.0	< 1.0	NS	< 1.0
o-Xylene	< 1.0	< 1.0	NS	< 1.0
m,p-Xylene	< 1.0	< 1.0	NS	< 1.0
Subtotal Project VOCs	**18.4**	**17.4**	--	**20.6**
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	NS	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	NS	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	NS	< 1.0
2-Butanone	< 10	< 10	NS	< 10
4-Methyl-2-Pentanone	< 5.0	< 5.0	NS	< 5.0
Acetone	< 10	< 10	NS	< 10
Bromodichloromethane	< 1.0	< 1.0	NS	< 1.0
Bromoform	< 1.0	< 1.0	NS	< 1.0
Bromomethane	< 2.0	< 2.0	NS	< 2.0
Carbon Disulfide	< 2.0	< 2.0	NS	< 2.0
Carbon Tetrachloride	< 1.0	< 1.0	NS	< 1.0
Chlorobenzene	< 1.0	< 1.0	NS	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	NS	< 1.0
Chlorodifluoromethane (Freon 22)	< 5.0	< 5.0	NS	< 5.0
Chloroethane	< 1.0	< 1.0	NS	< 1.0
Chloroform	**0.57**	< 1.0	NS	< 1.0
Chloromethane	< 1.0	< 1.0	NS	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	NS	< 1.0

Notes, Abbreviations, Qualifiers, and Units on last page.

Table 2
Summary of Influent Water Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Compound (All Constituent Concentrations in µg/L)	05/14/20	07/08/20	12/2/2020 [3]	02/10/21
Non-Project VOCs				
Dichlorodifluoromethane (Freon 12)	< 2.0	< 2.0	NS	< 2.0
Dichloromethane	< 2.0	< 2.0	NS	< 2.0
Ethylbenzene	< 1.0	< 1.0	NS	< 1.0
Methyl N-Butyl Ketone	< 5.0	< 5.0	NS	< 5.0
Methyl Tert-Butyl Ether	< 1.0	< 1.0	NS	< 1.0
Styrene (Monomer)	< 1.0	< 1.0	NS	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	NS	< 1.0
Trichlorofluoromethane (Freon 11)	< 2.0	< 2.0	NS	< 2.0
Trichlorotrifluoroethane (Freon 113)	< 5.0	< 5.0	NS	< 5.0
1-Chloro-1,1-difluoroethane (Freon 142b)	< 5.0	< 5.0	NS	< 5.0
Subtotal Non-Project VOCs	**0.6**	**ND**	**--**	**ND**
Total VOCs[1]	**19**	**17**	**--**	**21**
1,4-Dioxane	**1.3**	**1.0**	NS	0.43
pH[2]	5.6	5.6	--	5.2

Notes, Abbreviations, Qualifiers, and Units:

1. "Total VOCs" represents the sum of individual concentrations of the compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

2. Influent pH samples collected and measured in the field by Arcadis personnel on the dates listed using a field calibrated pH/conductivity meter. pH units are standard units.

3. Quarter 4 2020 sampling was conducted during ISTR Baker Tank discharge. The combined Influent sample port (WSP-5) is located upstream of the ISTR connection into the influent line. Due to this setup, the combined influent port (WSP-5) was not sampled as it would not be representative of the true combined influent.

USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
3.0	Bold value indicates a detection.
< 1.0	Compound not detected at or above the laboratory quantification limit.
µg/L	micrograms per liter
ND	Analyte not detected at, or above its laboratory quantification limit.
NS	Not sampled

Table 3
Summary of Effluent Water Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

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Compound (All Constituent Concentrations in µg/L)	Discharge Limit[1]	04/15/20	05/14/20	06/04/20	07/08/20	08/18/20	09/02/20	10/6/2020[7]	11/5/2020[7]	12/2/2020[7]	01/05/21	02/10/21	03/02/21
Project VOCs													
1,1,1-Trichloroethane	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans 1,2-Dichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Subtotal Project VOCs		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Compound (All Constituent Concentrations in µg/L)	**Discharge Limit[1]**	**04/15/20**	**05/14/20**	**06/04/20**	**07/08/20**	**08/18/20**	**09/02/20**	**10/6/2020[7]**	**11/5/2020[7]**	**12/2/2020[7]**	**01/05/21**	**02/10/21**	**03/02/21**
Non-Project VOCs													
Chloroform	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane	5[2]	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	5[2]	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Total VOCs[3]		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Treatment Efficiency[4]		> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%
Compound (All Constituent Concentrations in µg/L)	**Discharge Limit[1]**	**04/15/20**	**05/14/20**	**06/04/20**	**07/08/20**	**08/18/20**	**09/02/20**	**10/6/2020[7]**	**11/5/2020[7]**	**12/2/2020[7]**	**01/05/21**	**02/10/21**	**03/02/21**
Inorganics													
Total Iron	600	< 100	**144**	**113**	< 100	< 100	< 100	< 100	< 100	**189**	< 100	< 100	< 100
Total Manganese	600	**45.3**	**44.2**	**46.5**	**45.0**	**47.8**	**46.0**	**51.1**	**43.9**	**46.1**	**41.3**	**39.2**	**42.5**
Nitrate and Nitrite	10,000	**2,600**	**2,800**	**2,900**	**2,700**	**2,700**	**2,600**	**2,600**	**2,500**	**2,600**	**2,600**	**2,800**	**2,500**
Toal Kjeldahl Nitrogen	10,000	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	**210**	**230**
Total Nitrogen	10,000	**2,600**	**2,800**	**2,900**	**2,700**	**2,700**	**2,600**	**2,600**	**2,500**	**2,600**	**2,300**	**3,000**	**2,700**
1,4-Dioxane	NE	**1.2**	**1.4**	**1.3**	**1.3**	**1.1**	**1.2**	**1.1**	**1.6**	**1.3**	**0.24**	**0.64**	**1.4**
pH[5]	5.5-8.5	5.9	6.9	6.5	6.5	6.7	6.6	6.9 [(6)]	6.8	6.8	6.5	5.9	6.4

Notes, Abbreviations, Qualifers, and Units on last page.

Table 3
Summary of Effluent Water Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Notes, Abbreviations, Qualifiers, and Units:

1. Discharge limits per the interim SPDES equivalency program or Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Quality Standards and Guidance Values and Groundwater Effluent Limitations, if the compound is not part of the SPDES Permit Equivalency.

2. As of September 2017, the 10 SPDES VOCs discharge limits are per Site Number 1-30-003A Operable Unit 3 SPDES Permit Equivalency.

3. "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

4. Treatment efficiency was calculated by dividing the difference between the influent and effluent total VOC concentrations by the influent total VOC concentration.

5. Effluent pH measured on site using a handheld pH meter. pH units are standard units.

6. Due to pH meter malfunction on 10/6/20, the reported pH was measured on 10/15/20 under similar conditions during the second ISTR tank discharge.

7. Results validated following protocols specified in Sampling and Analysis Plan in the Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous annual reports for historical analytical results.

NYSDEC	New York State Department of Environmental Conservation
SPDES	State Pollutant Discharge Elimination System
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
NE	Not Established
102	Bold value indicates a detection.
< 0.50	Compound not detected above the laboratory quantification limit.
µg/L	micrograms per liter
ND	Analyte not detected at, or above its laboratory quantification limit.

Table 4
Influent Vapor Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Compound[1] (All Constituent Concentrations in µg/m^3)	05/14/20	07/08/20	10/6/2020[3]	2/10/2021[3]
Project VOCs				
1,1,1 - Trichloroethane	**1.0**	**1.3**	**1.3**	< 0.44
1,1 - Dichloroethane	**5.7**	**6.5**	**5.7**	< 0.65
1,2 - Dichloroethane	< 0.81	< 0.81	**0.34 J**	< 0.65
1,1 - Dichloroethene	**0.91**	**1.3**	**0.99**	< 0.13
Tetrachloroethene	**1.9**	**4.6**	**3.1**	< 0.22
Trichloroethene	**69.9**	**94.6**	**76.3**	**0.36**
Vinyl Chloride	**56.2**	**94.3**	**54.4**	**0.33**
cis 1,2-Dichloroethene	**170**	**206**	**195**	**1.2**
trans 1,2-Dichloroethene	**0.48 J**	**0.48 J**	**0.67**	< 0.63
Benzene	**0.35 J**	**0.58 J**	**0.73**	**0.30 J**
Toluene	**0.57 J**	**1.1**	**0.53 J**	< 0.6
o-Xylene	**0.83 J**	**1.5**	**1.1**	< 0.69
m,p-Xylene	< 0.87	**0.56 J**	**0.65 J**	< 0.69
Subtotal Project VOCs	**308**	**413**	**341**	**2**
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69	< 0.69	< 0.55	< 0.55
1,1,2-Trichloroethane	< 0.55	< 0.55	< 0.44	< 0.44
1,2-Dichloropropane	**0.51 J**	**0.65 J**	**0.55 J**	< 0.74
1,3-Butadiene	< 0.44	< 0.44	<0.35	< 0.35
2-Butanone	< 0.59	< 0.59	**0.68**	< 0.47
4-Methyl-2-Pentanone	< 0.82	< 0.82	< 0.66	< 0.66
Acetone	**6.9**	**5.2**	**5.5**	**2.6**
Bromodichloromethane	< 0.67	< 0.67	< 0.54	< 0.54
Bromoform	< 0.41	< 0.41	< 0.33	< 0.33
Bromomethane	< 0.78	< 0.78	< 0.62	< 0.62
Carbon Disulfide	< 0.62	< 0.62	< 0.50	< 0.5
Carbon Tetrachloride	< 0.25	< 0.25	**0.62**	**0.49**
Chlorobenzene	< 0.92	< 0.92	< 0.74	< 0.74
Chlorodibromomethane	< 0.85	< 0.85	< 0.68	< 0.68
Chlorodifluoromethane (Freon 22)	**5.6**	< 0.70	**6.3**	**0.77**
Chloroethane	< 0.53	< 0.53	< 0.42	< 0.42
Chloroform	**9.3**	**11**	**10**	< 0.78
Chloromethane	**1.3**	**1.5**	**1.6**	**0.89**
cis-1,3-Dichloropropene	< 0.91	< 0.91	< 0.73	< 0.73
Dichlorodifluoromethane (Freon 12)	**1.8**	**2.2**	**2.8**	**1.6**
Dichloromethane	**0.73**	< 0.69	**1.6**	**3.8**
Ethylbenzene	< 0.87	< 0.87	< 0.69	< 0.69
Methyl N-Butyl Ketone	< 0.82	< 0.82	< 0.65	< 0.65
Methyl Tert-Butyl Ether	< 0.72	< 0.72	**0.50 J**	< 0.58
Styrene (Monomer)	< 0.85	< 0.85	< 0.68	< 0.68
trans-1,3-Dichloropropene	< 0.91	< 0.91	< 0.73	< 0.73
Trichlorofluoromethane (Freon 11)	**1.2**	**1.3**	**1.7**	**2.4**
Trichlorotrifluoroethane (Freon 113)	**1.5**	**1.8**	**1.8**	< 0.61
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82	< 0.82	< 0.66	< 0.66
Subtotal Non-Project VOCs	**29**	**24**	**34**	**13**
Total VOCs[2]	**337**	**436**	**374**	**15**

Notes, Abbreviations, Qualifiers, and Units on last page.

Table 4
Influent Vapor Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Notes, Abbreviations, Qualifiers, and Units:

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. A VOC analyte list is provided in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). Influent samples were collected at Vapor Sampling Port-1 (VSP-1); refer to Figure 3 of this OM&M Report for the location of VSP-1.
2. "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.
3. Results validated following protocols specified in Sampling and Analysis Plan in the Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous annual reports for historical analytical results.

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
0.93	Bold value indicates a detection.
< 0.81	Compound not detected above the laboratory quantification limit.
J	Result is estimated.
µg/m^3	micrograms per cubic meter

Table 5
Summary of Effluent Vapor Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

ARCADIS

Compound[1] (All Constituent Concentrations in µg/m^3)	05/14/20	07/08/20	10/6/2020[3]	02/10/21
Project VOCs				
1,1,1 - Trichloroethane	**0.76**	**1.0**	**1.1**	**0.65**
1,1 - Dichloroethane	**4.9**	**6.1**	**5.7**	**3.70**
1,2 - Dichloroethane	< 0.81	< 0.81	**0.36 J**	**0.23 J**
1,1 - Dichloroethene	**0.71**	**1.1**	**0.87**	**0.91**
Tetrachloroethene	**1.2**	**3.3**	**4.0**	**1.6**
Trichloroethene	**30**	**50**	**37**	**29**
Vinyl Chloride	**26.1**	**44.2**	**28.1**	**27.6**
cis 1,2-Dichloroethene	**99.5**	**111**	**107**	**104**
trans 1,2-Dichloroethene	< 0.79	< 0.79	< 0.63	< 0.63
Benzene	< 0.64	< 0.64	**0.35 J**	**0.58**
Toluene	**1.4**	**1.3**	**1.2**	**1.3**
o-Xylene	**0.48 J**	**0.74 J**	**0.96**	< 0.69
m,p-Xylene	**0.56 J**	**0.48 J**	**1.5**	**0.52 J**
Subtotal Project VOCs	**166**	**219**	**188**	**170**
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	< 0.69	< 0.69	< 0.55	< 0.55
1,1,2-Trichloroethane	< 0.55	< 0.55	< 0.44	< 0.44
1,2-Dichloropropane	< 0.92	< 0.92	**0.38 J**	< 0.74
1,3-Butadiene	< 0.44	< 0.44	< 0.35	< 0.35
2-Butanone	< 0.59	< 0.59	**5.0**	**2.3**
4-Methyl-2-Pentanone	< 0.82	< 0.82	< 0.66	< 0.66
Acetone	**24.9**	**43.9**	**36.8**	**16**
Bromodichloromethane	< 0.67	< 0.67	< 0.54	< 0.54
Bromoform	< 0.41	< 0.41	< 0.33	< 0.33
Bromomethane	< 0.78	< 0.78	< 0.62	< 0.62
Carbon Disulfide	< 0.62	< 0.62	< 0.50	< 0.50
Carbon Tetrachloride	< 0.25	< 0.25	**0.50**	**0.75**
Chlorobenzene	< 0.92	< 0.92	< 0.74	< 0.74
Chlorodibromomethane	< 0.85	< 0.85	< 0.68	< 0.68
Chlorodifluoromethane (Freon 22)	**5.6**	< 0.70	**6.7**	**4.9**
Chloroethane	< 0.53	< 0.53	< 0.42	< 0.42
Chloroform	**9.3**	**12.0**	**10**	**8.3**
Chloromethane	**1.1**	**1.4**	**1.5**	**1.2**
cis-1,3-Dichloropropene	< 0.91	< 0.91	< 0.73	< 0.73
Dichlorodifluoromethane (Freon 12)	**1.8**	**2.3**	**2.9**	**1.6**
Dichloromethane	**0.76**	< 0.69	**2.6**	< 0.56
Ethylbenzene	< 0.87	< 0.87	< 0.69	**0.52 J**
Methyl N-Butyl Ketone	< 0.82	< 0.82	< 0.65	< 0.65
Methyl Tert-Butyl Ether	< 0.72	< 0.72	< 0.58	< 0.58
Styrene (Monomer)	< 0.85	< 0.85	< 0.68	< 0.68
trans-1,3-Dichloropropene	< 0.91	< 0.91	< 0.73	< 0.73
Trichlorofluoromethane (Freon 11)	**1.2**	**1.5**	**2.0**	**1.2**
Trichlorotrifluoroethane (Freon 113)	**1.6**	**2.2**	**2.1**	**1.8**
1-Chloro-1,1-difluoroethane (Freon 142b)	< 0.82	< 0.82	< 0.66	< 0.66
Subtotal Non-Project VOCs	**46**	**63**	**70**	**39**
Total VOCs[2]	**212**	**283**	**259**	**209**

Notes, Abbreviations, Qualifiers, and Units on last page.

Table 5
Summary of Effluent Vapor Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Notes, Abbreviations, Qualifiers, and Units:

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. A VOC analyte list is provided in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.

2. "Total VOCs" represents the sum of individual concentrations of all compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

3. Results validated following protocols specified in Sampling and Analysis Plan in the Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous annual reports for historical analytical results.

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
0.76	Bold value indicates a detection.
< 0.81	Compound not detected above the laboratory quantification limit.
J	Result is estimated.
µg/m^3	micrograms per cubic meter

Table 6
Summary of Effluent Vapor Tentatively Identified Compounds
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Compound[1] (All Constituent Concentrations in ppbv)	05/14/20	07/08/20	10/6/2020[3]	02/10/21
Tentatively Identified Compounds				
Acetone	ND	ND	ND	ND
Carbon Dioxide	**170 JB**	**170 JNB**	**65 JNB**	**230 JNB**
Difluorochloromethane	ND	ND	ND	ND
Ethanol	ND	ND	**1.3 JN**	**1.2 JN**
Cumene	ND	**1.8 JN**	**1.6 JN**	ND
2-Phenyl-2-Propanol	ND	**1.2 JN**	ND	ND
Acetaldehyde	ND	ND	**4.2 JN**	ND
Unknown (A)	ND	ND	ND	ND
Unknown (B)	ND	**5.7 J**	ND	ND
Total VOC TICs[2]	ND	**8.7 J**	**7.1 J**	**1.2 J**

Notes, Abbreviations, Qualifiers, and Units:

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. A VOC analyte list is provided in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.

2. Compounds found in associated method blank are not included in Total VOC TICs.

3. Results validated following protocols specified in Sampling and Analysis Plan in the Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous annual reports for historical analytical results.

ECU	Emission Control Unit
ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance, and Monitoring
TIC	Tentatively Identified Compound
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
3.3	Bold value indicates a detection.
ND	TIC were not detected.
B	TIC was detected in the associated method blank.
J	Result is estimated.
N	Indicates presumptive evidence of a compound.
ppbv	parts per billion by volume

Table 7
Summary of System Parameters
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

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Date [1]	Water Flow Rates (All Flows in gpm)						Water Pressures (All Pressures in psi)					Air Flow Rate (scfm) [2]	Air Pressures (All Pressures in iwc) [5,6]					Air Temp. (^{o}R)[5]
	Remedial Well [2]				Combined Influent [3]	Effluent [2]	Remedial Well Effluent [2,4]				Effluent [5]	Effluent	ECU Influents				Effluent	Effluent
	RW-1	RW-2	RW-3	RW-4			RW-1	RW-2	RW-3	RW-4			GAC-501	GAC-502	PPZ-601	PPZ-602		
01/16/20	30.3	75.8	75.6	30.6	212	231	57	44	42	56	14	1,526	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	531
02/06/20	31.5	75.5	76.3	30.1	213	225	56	42	38	56	14	1,575	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	530
03/03/20	30.7	75.8	75.5	30.6	213	227	56	33	40	56	15	1,600	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	538
04/15/20	31.2	70.1	75.4	30.8	208	213	56	6	36	56	16	1,570	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	538
05/14/20	30.2	75.8	75.2	30.2	211	226	57	50	36	57	25	1,572	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	548
06/04/20	30.8	75.0	75.0	31.3	212	219	56	46	33	55	14	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	544
07/08/20	30.6	75.3	75.4	30.2	211	225	57	42	36	56	17	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	550
08/18/20	30.4	75.0	75.0	30.0	210	227	57	46	35	55	13	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	544
09/02/20	30.8	74.5	74.9	30.3	211	220	56	41	36	56	16	1,500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	544
10/19/2020[7]	30.2	75.0	75.4	30.1	211	226	56	66	39	56	14	1,515	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	540
11/05/20	30.7	75.0	74.8	30.4	211	227	56	60	38	55	16	1,475	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	540
12/02/20	30.1	77.2	75.4	30.1	213	221	57	37	36	56	12	1,493	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	531
01/05/21	30.3	66.8	75.5	30.4	203	218	56	6	31	56	14	1,474	< 1.0	< 1.0	< 1.0	< 1.0	5.0	521
02/10/21	30.1	45.0	75.0	30.2	180	195	56	4	33	56	9	1,533	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	520
03/02/21	29.9	73.9	76.0	29.4	209	232	57	59	31	57	25	1,460	< 1.0	< 1.0	< 1.0	< 1.0	1.0	519

Notes, Abbreviations, and Units on last page.

Table 7
Summary of System Parameters
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Notes, Abbreviations, and Units:

1. Operational data collected by Arcadis on days noted. Parameters listed were typically recorded during compliance monitoring events. Data in this table correspond to approximately the past year of system operation.
2. Instantaneous parameters obtained from the SCADA HMI: Water Flow Rate, Water Pressure, Air Flow Rate.
3. Combined influent water-flow rate is the sum of individual well flow rates via the SCADA System.
4. Remedial Well effluent pressure readings measured at the influent manifold within the treatment system building.
5. Instantaneous values recorded from field-mounted instruments during weekly site visits. On 5/14/2020 effluent air temperature was recorded using SCADA daily average temperature due to gauge calibration.
6. Pressure readings recorded as < 1.0 iwc due to pressure being too low for gauge sensitivity.
7. Data recorded by Northrop Grumman Operator due to compliance monitoring event taking place during ISTR discharge event which required RW-1 to be turned off.

ECU	Emission Control Unit
GAC	Granular Activated Carbon
HMI	Human-Machine Interface
RW	Remedial Well
SCADA	Supervisory Control and Data Acquisition
Temp	Temperature
gpm	gallons per minute
iwc	inches of water column
psi	pounds per square inch
^{o}R	degrees Rankine
scfm	standard cubic feet per minute

Table 8
Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

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Operating Period [1]	Volume of Groundwater Recovered (x1,000 gal) [2]					VOC Mass Recovered (lbs) [3]															VOC Mass Recovery Rate (lbs/day) [4]													
						Total VOCs [5]					Project VOCs [6]					Non-Project VOCs [7]					Total VOCs [5]					Project VOCs [6]					Non-Project VOCs [7]				
	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total
System Pilot Test, Shakedown and Startup Totals[8]	137	270	251	150	808	NA	NA	NA	NA	1.1	NA	NA	NA	NA	1.0	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2010 Totals	15,726	35,127	38,160	15,689	104,702	0.56	172	412	89	672	0.56	171	28	0.10	200	< 0.01	0.17	383	89	469	< 0.01	0.46	1.1	0.24	1.8	< 0.01	0.46	0.075	< 0.01	0.54	< 0.01	< 0.01	1.0	0.24	1.3
2011 Totals	15,218	36,570	37,682	15,196	104,666	0.36	167	271	78	516	0.36	167	35	0.090	203	< 0.01	1.1	236	78	314	< 0.01	0.45	0.73	0.21	1.4	< 0.01	0.45	0.095	< 0.01	0.55	< 0.01	< 0.01	0.64	0.21	0.85
2012 Totals	15,260	35,178	36,111	15,336	101,885	0.28	114	113	40	267	0.25	113	12	0.39	126	< 0.01	1.5	101	40	141	< 0.01	0.31	0.31	0.11	0.73	< 0.01	0.31	0.032	< 0.01	0.35	< 0.01	< 0.01	0.28	0.11	0.39
2013 Totals	15,968	37,514	36,622	16,036	106,140	0.14	111	41	18	171	0.14	110	4.3	0.36	113	< 0.01	1.6	37	18	57	< 0.01	0.30	0.11	0.050	0.47	< 0.01	0.30	0.012	< 0.01	0.31	< 0.01	< 0.01	0.10	0.049	0.16
2014 Totals	15,690	33,222	31,199	15,691	95,802	0.063	67	9.9	8.1	85	0.063	65	2.0	0.20	67	< 0.01	1.5	8.1	7.9	17	< 0.01	0.19	0.028	0.023	0.24	< 0.01	0.18	< 0.01	< 0.01	0.19	< 0.01	< 0.01	0.023	0.022	0.047
2015 Totals	15,859	38,082	34,961	14,755	103,657	0.028	47	7.1	4.5	57	0.021	45	1.5	0.20	45	<0.01	1.7	5.6	4.2	12	<0.01	0.13	0.019	0.012	0.16	<0.01	0.12	<0.01	<0.01	0.12	<0.01	<0.01	0.015	0.012	0.032
2016 Totals	15,826	34,539	39,349	15,826	105,540	<0.01	38	3.2	2.2	44	<0.01	37	1.4	0.20	39	<0.01	1.5	1.7	2.0	5.2	<0.01	0.10	<0.01	<0.01	0.12	<0.01	0.10	<0.01	<0.01	0.11	<0.01	<0.01	<0.01	<0.01	0.014
2017 Totals	16,005	31,600	37,614	15,965	101,184	< 0.01	13	2.2	1.2	17	< 0.01	13	1.1	0.16	14	< 0.01	0.56	1.1	1.1	2.7	< 0.01	0.037	< 0.01	< 0.01	0.046	< 0.01	0.035	< 0.01	< 0.01	0.038	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2018 Totals	15,145	37,712	32,473	14,917	100,247	< 0.01	13.71	0.90	0.56	15.2	< 0.01	13.5	0.70	< 0.01	14.2	< 0.01	0.27	0.19	0.52	0.97	< 0.01	0.038	< 0.01	< 0.01	0.042	< 0.01	0.037	< 0.01	< 0.01	0.039	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2019 Totals	15,456	32,470	38,416	15,343	101,685	< 0.01	11.51	1.36	0.22	13.10	< 0.01	11.51	1.07	< 0.01	12.59	< 0.01	< 0.01	0.29	0.18	0.63	< 0.01	0.032	< 0.01	< 0.01	0.036	< 0.01	0.032	< 0.01	< 0.01	0.034	< 0.01	< 0.01	< 0.01	0.001	< 0.01
2020 Totals	14,475	35,814	37,537	15,113	102,939	< 0.01	19.3	1.3	< 0.01	20.6	< 0.01	19.3	0.91	< 0.01	20.2	< 0.01	< 0.01	0.36	< 0.01	0.36	< 0.01	0.053	< 0.01	< 0.01	0.056	< 0.01	0.053	< 0.01	< 0.01	0.055	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
January 2021 through March 2021																																			
01/01/21 - 02/01/21	1,325	2,694	3,340	1,345	8,704	< 0.01	1.93	0.15	< 0.01	2.08	< 0.01	1.9	0.11	< 0.01	2.0	< 0.01	< 0.01	0.03	< 0.01	0.033	< 0.01	0.062	< 0.01	< 0.01	0.067	< 0.01	0.062	< 0.01	< 0.01	0.066	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
02/01/21 - 03/01/21	1,186	2,579	3,043	1,210	8,018	< 0.01	1.85	0.13	< 0.01	1.98	< 0.01	1.9	0.10	< 0.01	2.0	< 0.01	< 0.01	0.03	< 0.01	0.030	< 0.01	0.066	< 0.01	< 0.01	0.071	< 0.01	0.066	< 0.01	< 0.01	0.070	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
03/01/21 - 04/01/21	1,308	3,281	3,298	1,314	9,201	< 0.01	2.35	0.15	< 0.01	2.50	< 0.01	2.4	0.11	< 0.01	2.5	< 0.01	< 0.01	0.03	< 0.01	0.033	< 0.01	0.076	< 0.01	< 0.01	0.081	< 0.01	0.076	< 0.01	< 0.01	0.080	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Subtotal Jan - Mar 2021[9]	3,820	8,554	9,681	3,869	25,923	< 0.01	6.14	0.43	< 0.01	6.56	< 0.01	6.1	0.33	< 0.01	6.5	< 0.01	< 0.01	0.10	< 0.01	0.10	< 0.01	0.068	< 0.01	< 0.01	0.073	< 0.01	0.068	< 0.01	< 0.01	0.072	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2021 Totals	3,820	8,554	9,681	3,869	25,923	< 0.01	6.1	0.4	< 0.01	6.6	< 0.01	6.1	0.33	< 0.01	6.5	< 0.01	< 0.01	0.10	< 0.01	0.10	< 0.01	0.068	< 0.01	< 0.01	0.073	< 0.01	0.068	< 0.01	< 0.01	0.019	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Since System Start Up	181,177	410,489	426,501	180,460	1,198,627	2	1,055	917	256	2,227	2	1,044	107	2	1,155	< 0.01	10	810	254	1,067	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes, Abbreviations, Qualifiers, and Units:

1. Represents operating period between consecutive monitoring events.

2. Volume of groundwater recovered is based on individual local well totalized flow readings. Listed value is the difference between totalized flow values recorded between consecutive monitoring events. The total groundwater recovered during a given operating period is the sum of the individual well flow totals. Values shown are rounded to the nearest gallon, but should only be considered accurate to two significant figures to account for error associated with field measurements.

3. Mass recovered per well was calculated by multiplying the Total VOC concentration from the most recent sampling event by the number of gallons extracted during the reporting period. The total amount recovered during a given operating period is the sum of masses recovered from each of the individual wells. Values less than ten pounds are presented using two significant figures and values greater than ten pounds have been rounded to the nearest whole number; however, these values should only be considered accurate to two significant figures to account for error associated with field measurements and analytical data.

4. Mass recovery rates were calculated by dividing the total mass recovered for each well and for the system by the number of days in the respective operating period. Values are presented using two significant figures.

5. "Total VOCs" represents the sum of individual concentrations of the VOCs detected.

6. "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethelyene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m, p.

7. "Non-Project VOCs" represents the difference between Total VOCs and Project VOCs.

8. Values based on operational data recorded prior to system startup on July 21, 2009.

9. The volume of groundwater recovered and mass recovered calculations represent the operational period between January 1st, 2021 and April 1st 2021.

NA	Not Applicable
VOC	Volatile Organic Compound.
<	Less than
gal	Gallons
lbs	Pounds
lbs/day	Pounds per day

Table 9
Summary of Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

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Toxic Air Contaminant[4]	CAS#	VSP-05 Vapor Effluent (µg/m^3)	Emission Rate[1]			Scaled Impact - Hourly[2] (µg/m^3)	Scaled Impact - Annual[2] (µg/m^3)	SGC[3] (µg/m^3)	AGC[3] (µg/m^3)	% of SGC	% of AGC
		2/10/2021	lb/yr	lb/hr	g/s						
Project VOCs											
1,1,1-Trichloroethane	71-55-6	0.7	0.03	3.72E-06	4.7E-07	4.6E-03	8.9E-05	9,000	5,000	0.0%	0.0%
1,1-Dichloroethane	75-34-3	3.7	0.19	2.12E-05	2.7E-06	2.6E-02	5.1E-04	--	0.63	--	0.1%
1,1-Dichloroethene	75-35-4	0.23 J	0.01	1.32E-06	1.7E-07	1.6E-03	3.1E-05	--	200	--	0.0%
1,2-Dichloroethane	107-06-2	0.91	0.05	5.21E-06	6.6E-07	6.4E-03	1.2E-04	--	0.04	--	0.3%
Benzene	71-43-2	1.60	0.08	9.17E-06	1.2E-06	1.1E-02	2.2E-04	1,300	0.13	0.0%	0.2%
cis-1,2-Dichloroethene	156-59-2	29	1.46	1.66E-04	2.1E-05	2.0E-01	4.0E-03	--	63	--	0.0%
Tetrachloroethene	127-18-4	27.6	1.39	1.58E-04	2.0E-05	1.9E-01	3.8E-03	300	4	0.1%	0.1%
Toluene	108-88-3	104	5.22	5.96E-04	7.5E-05	7.3E-01	1.4E-02	37,000	5,000	0.0%	0.0%
Trichloroethene	79-01-6	0.58	0.03	3.32E-06	4.2E-07	4.1E-03	7.9E-05	20	0.2	0.0%	0.0%
Vinyl Chloride	75-01-4	1.3	0.07	7.45E-06	9.4E-07	9.2E-03	1.8E-04	180,000	0.11	0.0%	0.2%
Xylenes - M,P	1330-20-7	0.52 J	0.03	2.98E-06	3.8E-07	3.7E-03	7.1E-05	22,000	100	0.0%	0.0%
Non-Project VOCs											
2-Butanone	78-93-3	2.3	0.12	1.32E-05	1.7E-06	1.6E-02	3.1E-04	13,000	5000	0.0%	0.0%
Acetone	67-64-1	16	0.80	9.17E-05	1.2E-05	1.1E-01	2.2E-03	180,000	30,000	0.0%	0.0%
Carbon Tetrachloride	56-23-5	0.75	0.04	4.30E-06	5.4E-07	5.3E-03	1.0E-04	1,900	0	0.0%	0.1%
Chlorodifluoromethane (Freon 22)	75-45-6	4.9	0.25	2.81E-05	3.5E-06	3.5E-02	6.7E-04	--	50,000	--	0.0%
Chloroform	67-66-3	8.3	0.42	4.76E-05	6.0E-06	5.9E-02	1.1E-03	150	14.7	0.0%	0.0%
Chloromethane	74-87-3	1.2	0.06	6.88E-06	8.7E-07	8.5E-03	1.6E-04	22,000	90	0.0%	0.0%
Dichlorodifluoromethane (Freon 12)	75-71-8	1.6	0.08	9.17E-06	1.2E-06	1.1E-02	2.2E-04	--	12000	--	0.0%
Ethylbenzene	100-41-4	0.52 J	0.03	2.98E-06	3.8E-07	3.7E-03	7.1E-05	--	1,000	--	0.0%
Trichlorofluoromethane (Freon 11)	75-69-4	1.2	0.06	6.88E-06	8.7E-07	8.5E-03	1.6E-04	9,000	5,000	0.0%	0.0%
Trichlorotrifluoroethane (Freon 113)	76-13-1	1.8	0.09	1.03E-05	1.3E-06	1.3E-02	2.5E-04	960,000	180,000	0.0%	0.0%

Notes, Abbreviations, and Units on last page.

Table 9
Summary of Air Quality Impact Analysis
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

ARCADIS

Notes, Abbreviations, and Units:

1. Emission rate calculated based on VSP-05 effluent concentration and air flow rate of 1,533 ft^3/min recorded during compliance monitoring event on 2/10/2021. Emission rate standardized at 70 ^oF and 1 atm.

   1,1,1-Trichloroethane (lb/hr) = TCE [µg/m^3] x Air Flow Rate [ft^3/min] x (1 m^3/35.3147 ft^3) x (60 min/hr) x (0.000001 g/1 µg) x (0.0022 lb/g)

   lb/yr = lb/hr x 8,760 hrs/yr

   g/s = lb/hr x hr/3,600 sec x 453.59 g/lb

2. Ambient impact based on AERMOD modeling using normalized 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 (Brookhaven/Farmingdale) for the years 2015 through 2019. The maximum impact from all the years was used for the calculations.

   Scaled hourly impact (µg/m^3) = AERMOD predicted hourly ambient impact at 1 g/s ([µg/m^3]/[g/s]) x Actual emission rate (g/s)

   Scaled annual impact (µg/m^3) = AERMOD predicted annual ambient impact at 1 g/s ([µg/m^3]/[g/s]) x Actual emission rate (g/s)

AERMOD Normalized Ambient Impact at 1 g/s	
Hourly ([µg/m^3]/[g/s])	Annual ([µg/m^3]/[g/s])
9,778.35	189.33

3. Short-term and annual guideline concentrations specified in the NYSDEC DAR-1 AGC/SGC tables revised August 10, 2016.
4. Compounds not detected above the laboratory reporting limit are excluded from the air quality impact analysis summary.

AGC	Annual Guideline Concentration
DAR-1	Division of Air Resources-1
--	None Specified
NYSDEC	New York State Department of Environmental Conservation
SGC	Short-term Guideline Concentration
VSP	Vapor Sampling Point
cfm	cubic feet per minute
g/s	grams per second
lb/hr	pounds per hour
lb/yr	pounds per year
µg/m^3	micrograms per cubic meter

Table 10
Summary of Remedial Well Groundwater Sample Analytical Results - VOCs
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Compound[1] (All Constituent Concentrations in µg/L)	Sample Location: Sample Date: NYSDEC SCGs	RW-1 5/14/2020	RW-1 7/8/2020	RW-1 10/20/2020	RW-1 2/10/2021	RW-2 5/14/2020	RW-2 7/8/2020	RW-2 10/6/2020	RW-2 2/10/2021	RW-3 5/14/2020	RW-3 7/8/2020	RW-3 10/6/2020	RW-3 2/10/2021	RW-4 5/14/2020	RW-4 7/8/2020	RW-4 10/6/2020	RW-4 2/10/2021
Project VOCs																	
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	**0.98 J**	**0.91 J**	**1.0**	**1.1**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene	5	< 1.0	< 1.0	< 1.0	< 1.0	**13.0**	**12.0**	**14.7**	**14.0**	**0.63 J**	**1.7**	**1.7**	**2.1**	**0.63 J**	< 1.0	**0.58 J**	**0.56 J**
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	< 1.0	**13.6**	**17**	**17.1**	**12.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	**32.4**	**33.9**	**48.6**	**59.0**	**1.5**	**1.1**	**1.3**	**2.0**	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene-o	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes-m,p	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Subtotal Project VOCs		**ND**	**ND**	**ND**	**ND**	**60.0**	**63.8**	**80.4**	**86.1**	**2.1**	**2.8**	**3.0**	**4.1**	**0.63**	**ND**	**0.58**	**0.56**
Non-Project VOCs																	
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Butadiene	0.5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Butanone	NE	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-methyl-2-pentanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**1.4**	**1.3**	**1.3**	**1.2**	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichloromethane	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl tert-Butyl Ether	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane (Freon 11)	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1-Chloro-1,1-difluoroethane (Freon 142b)	NE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs		**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**1.4**	**1.3**	**1.3**	**1.2**	**ND**	**ND**	**ND**	**ND**
Total VOCs[2]		**ND**	**ND**	**ND**	**ND**	**60.0**	**63.8**	**80.4**	**86.1**	**3.5**	**4.1**	**4.3**	**5.3**	**0.63**	**ND**	**0.58**	**0.56**
1,4-Dioxane		**0.32**	**0.32**	**0.31**	**0.26**	**3.0**	**3.0**	**1.9**	**2.7**	**0.59**	**0.45**	**0.46**	**0.65**	**0.18 J**	**0.13 J**	**0.25 U**	**0.12 J**

Notes, Abbreviations, Qualifiers, and Units on last page.

Table 10
Summary of Remedial Well Groundwater Sample Analytical Results - VOCs
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

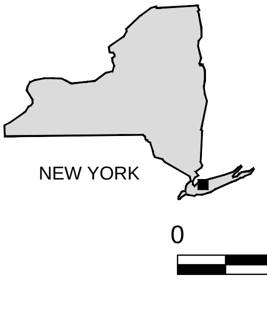
Notes, Abbreviations, Qualifiers, and Units:

1. Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3 (prior to September 1, 2014) and per EPA Method 8260C (after September 1, 2014). Results validated following protocols specified in Sampling and Analysis Plan in the DRAFT Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous quarterly reports for historical analytical results.

2. "Total VOCs" represents the sum of individual concentrations of the VOCs detected.

ASP	Analytical Services Protocol
ELAP	Environmental Laboratory Approval Program
NE	Not Established
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OLM	Ozone Limited Method
OM&M	Operation, Maintenance, and Monitoring
SCGs	Standards, Criteria, and Guidance values
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
	Bold cell outline indicates an exceedance of an SCG
1.1	Bold data indicates a detection
< 1.0	Compound not detected above its laboratory quantification limit
J	Compound detected below its reporting limit; value is estimated
U	Indicates the compound was analyzed for but not detected above the specified level
ND	Analyte not detected at, or above its laboratory quantification limit.
µg/L	micrograms per liter

SOURCE:
USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, N.Y., 1994, FREEPORT QUADRANGLE, FREEPORT, N.Y., 1994,
HICKSVILLE QUADRANGLE, HICKSVILLE, N.Y., 1967, PHOTOREVISED 1979, HUNTINGTON, N.Y., 1967, PHOTOREVISED 1979



BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

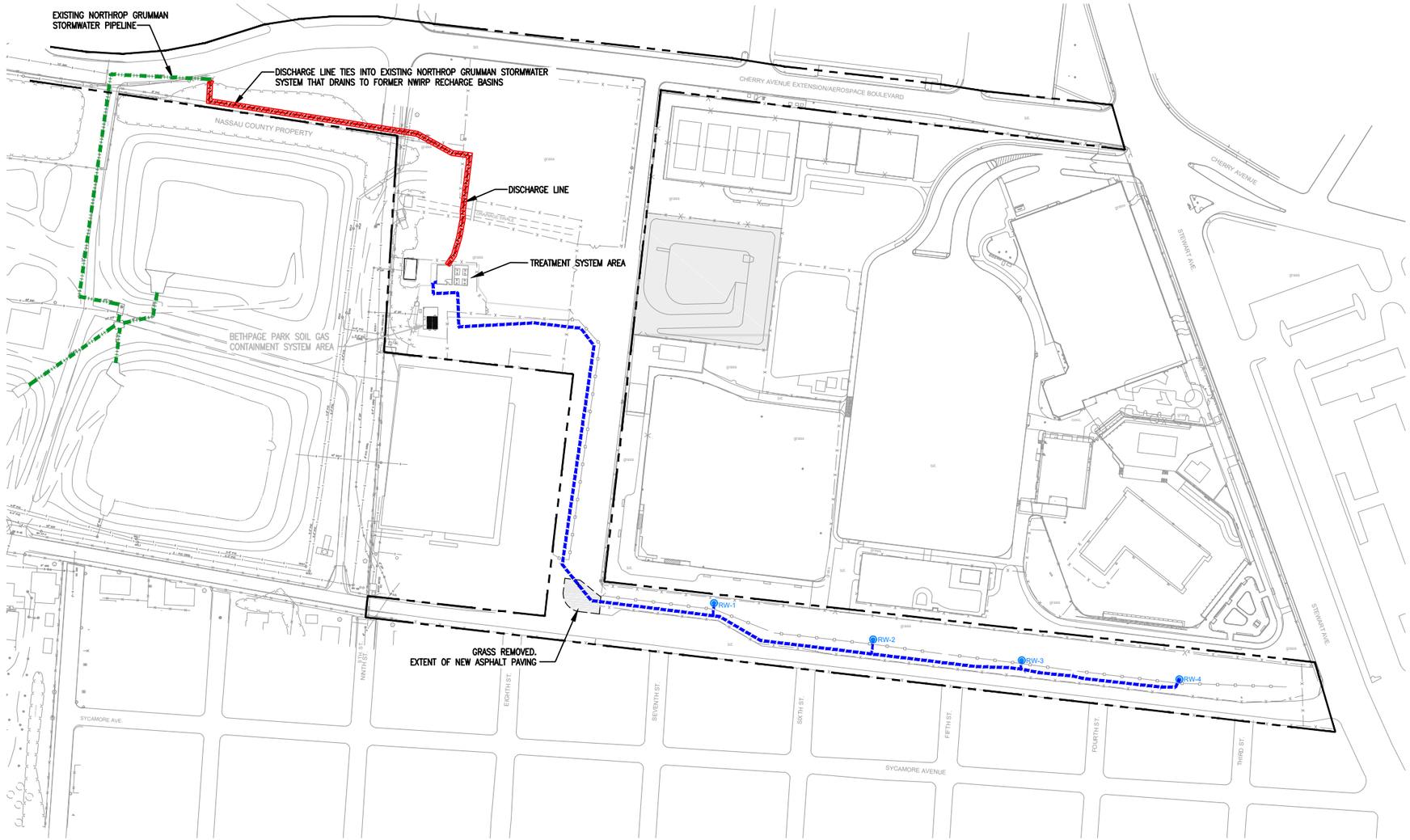
SITE LOCATION

ARCADIS

FIGURE
1

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD: PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\NY001496\1114\OMM\4\NY1496_B01.dwg LAYOUT: BETHPAGE PARK SAVED: 11/11/2015 4:51 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY

XREFS: IMAGES: PROJECTNAME: ----
AMITYVILLE.TIF
FREEPORT.TIF
HICKSVILLE.TIF
HUNTINGTON.TIF



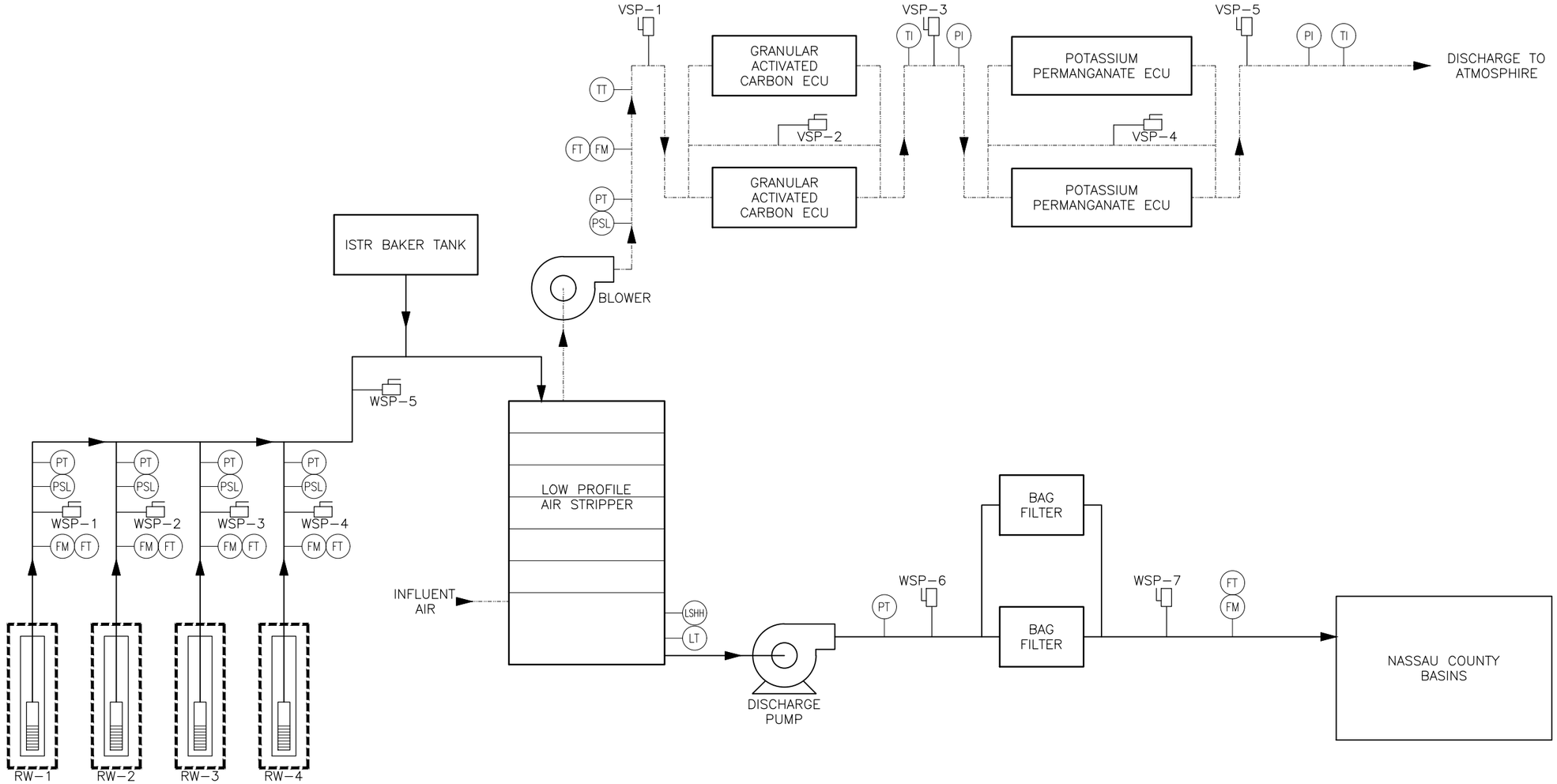
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AND GROUNDWATER CONTAINMENT SYSTEM

ARCADIS

FIGURE 2

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD:AS PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\alsanchez\OneDrive - ARCADIS\BIM 360 Docs\NORTHROP GRUMMAN\OMM4\NY1496B01.DWG LAYOUT:2 SAVED: 8/16/2018 1:24 PM ACADVER: 21.0S (LMS TECH) PAGESETUP:---- PLOTSTYLETABLE:---- PLOTTED: 8/16/2018 1:24 PM BY: SANCHEZ, ADRIAN
XREFS:
X-r1496X00
X-ONSITE-BASE SITE
IMAGES:
PROJECTNAME: ----



LEGEND:

- PROCESS WATER
- PROCESS AIR
- FM — INSTRUMENT
- SAMPLE PORT
- FLOW DIRECTION
- FM FLOW METER
- FT FLOW RATE TRANSMITTER
- PSL PRESSURE VACUUM LOW
- PT PRESSURE TRANSMITTER
- PI PRESSURE INDICATOR
- LSHH LEVEL SWITCH HIGH HIGH
- LT LEVEL TRANSMITTER
- TT TEMPERATURE TRANSMITTER
- TI TEMPERATURE INDICATOR
- WSP WATER SAMPLE PORT
- VSP VAPOR SAMPLE PORT
- ECU EMISSION CONTROL UNIT

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

GROUNDWATER TREATMENT SYSTEM PROCESS SCHEMATIC, PROCESS FLOW DIAGRAM, AND MONITORING LOCATIONS

ARCADIS

FIGURE 3

CHERRY AVENUE EXTENSION/AEROSPACE BOULEVARD
FORMER NURSERY AREAS
BALL FIELDS
grass
OU3 BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM (BPGWCS) BUILDINGS
DRAINAGE SWALE
OU3 BETHPAGE PARK SOIL GAS CONTAINMENT SYSTEM (BPSGCS) BUILDINGS
McKAY FIELD
ACCESS ROAD
FORMER TRANSFORMER AREA
ARUMDAUN PRESBYTERIAN CHURCH VISION CENTER (FORMER GRUMMAN PLANT 24)
PARKING LOT
TENNIS COURTS
PADDLEBALL COURTS
BASKETBALL COURTS
B30MW-1
B24MW-2
RECHARGE BASIN
SKATE PARK
TOWN STORAGE AREA
STORAGE BUILDING
BCPMW-1
PZ-9A
BLDG
GATE
PZ-10A
BASEBALL FIELD
BCPMW-5-1
BCPMW-3
BCPMW-2
PARKING LOT
bit.
PLAYGROUND
POOL HOUSE
POOL AREA
INGROUND SWIMMING POOL
1 STORY MASONRY
conc.
CHERRY AVENUE
STEWART AVE.
BETHPAGE HIGH SCHOOL PROPERTY
PZ-5A
PZ-5B
PZ-5C
RW-1
B24MW-3
GRASS REMOVED
EXTENT OF NEW ASPHALT PAVING
BCPMW-4-1
BCPMW-4-2
BCPMW-4-3
PZ-1A
PZ-1B
PZ-1C
RW-2
PZ-2A
PZ-2B
PZ-2C
FORMER GRUMMAN PLANT 24 ACCESS ROAD PROPERTY
PZ-8A
PZ-8B
PZ-8C
RW-3
PZ-6A
PZ-6B
BCPMW-6-1
BCPMW-6-2
RW-4
PZ-7A
PZ-7B
BCPMW-7-1
PZ-4
PZ-3
EIGHTH ST.
SEVENTH ST.
SIXTH ST.
FIFTH ST.
FOURTH ST.
THIRD ST.
MW-204-1
MW-205-1
MW-206-1
MW-200-1
MW-201-1
MW-202-1
MW-203-1
SYCAMORE AVENUE
MW-207-1a
MW-207-1b
MW-208-1

EXPLANATION:

- NORTHROP GRUMMAN PROPERTY LINE
- x — x FENCE
- BASIN
- bit. BITUMINOUS PAVEMENT
- MW-200-1 MONITORING WELL
- RW-2 REMEDIAL WELL
- PZ-2C PIEZOMETER

NOTES:

1. MONITORING WELLS, REMEDIAL WELLS, AND PIEZOMETERS SURVEYED TO NORTH AMERICAN DATUM (NAD) 83.
2. PARK FEATURES SHOWN WERE PRESENT PRIOR TO TOWN OF OYSTER BAY REDEVELOPMENT IN 2005.

0 100' 200'

APPROXIMATE SCALE IN FEET

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

GROUNDWATER MONITORING NETWORK SITE PLAN

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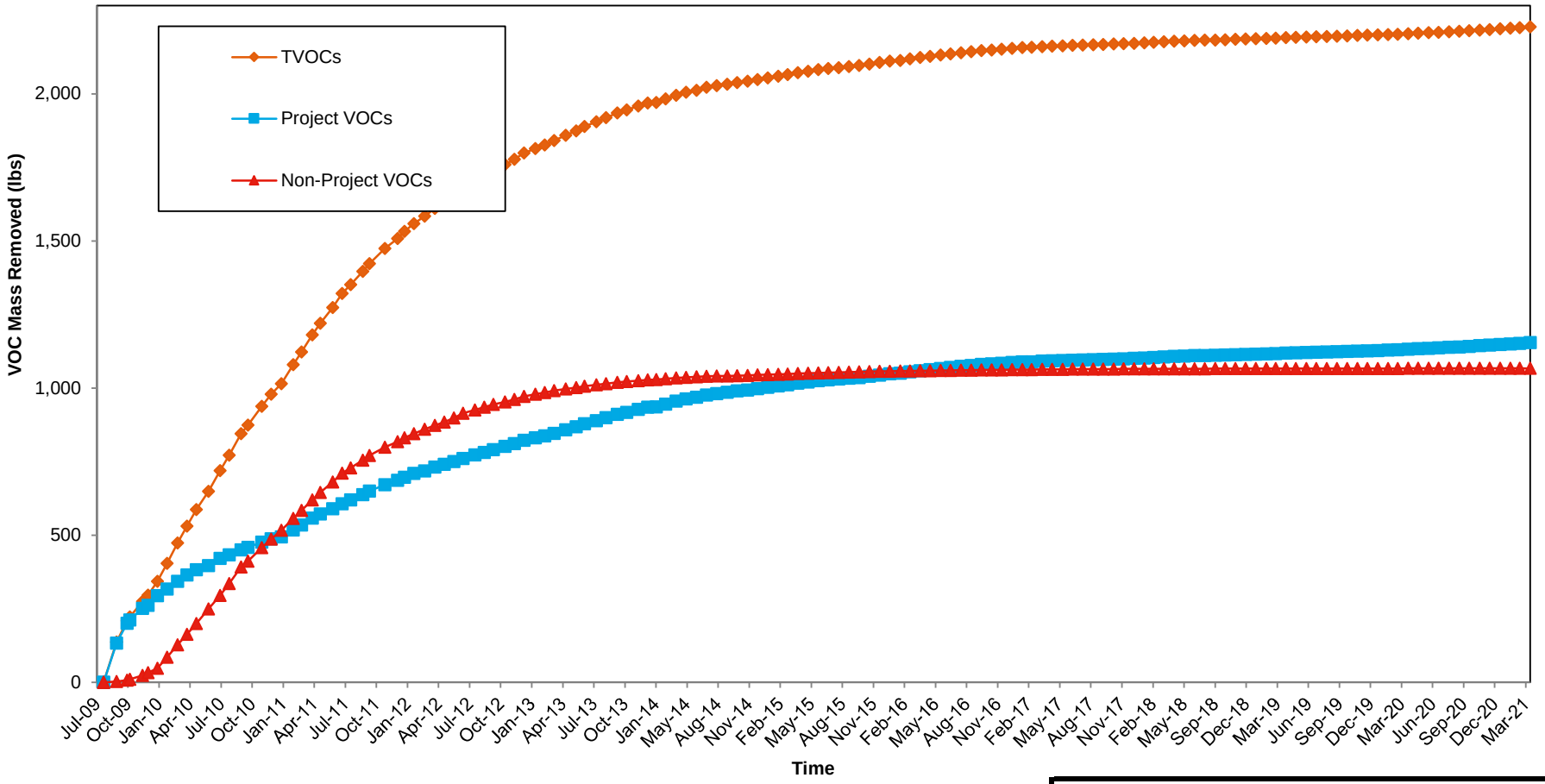
FIGURE 4



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected

Project VOCs = sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.
Non-Project VOCs = sum of VOCs that are not Project VOCs.

lbs = pounds

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
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CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT VOC MASS REMOVED

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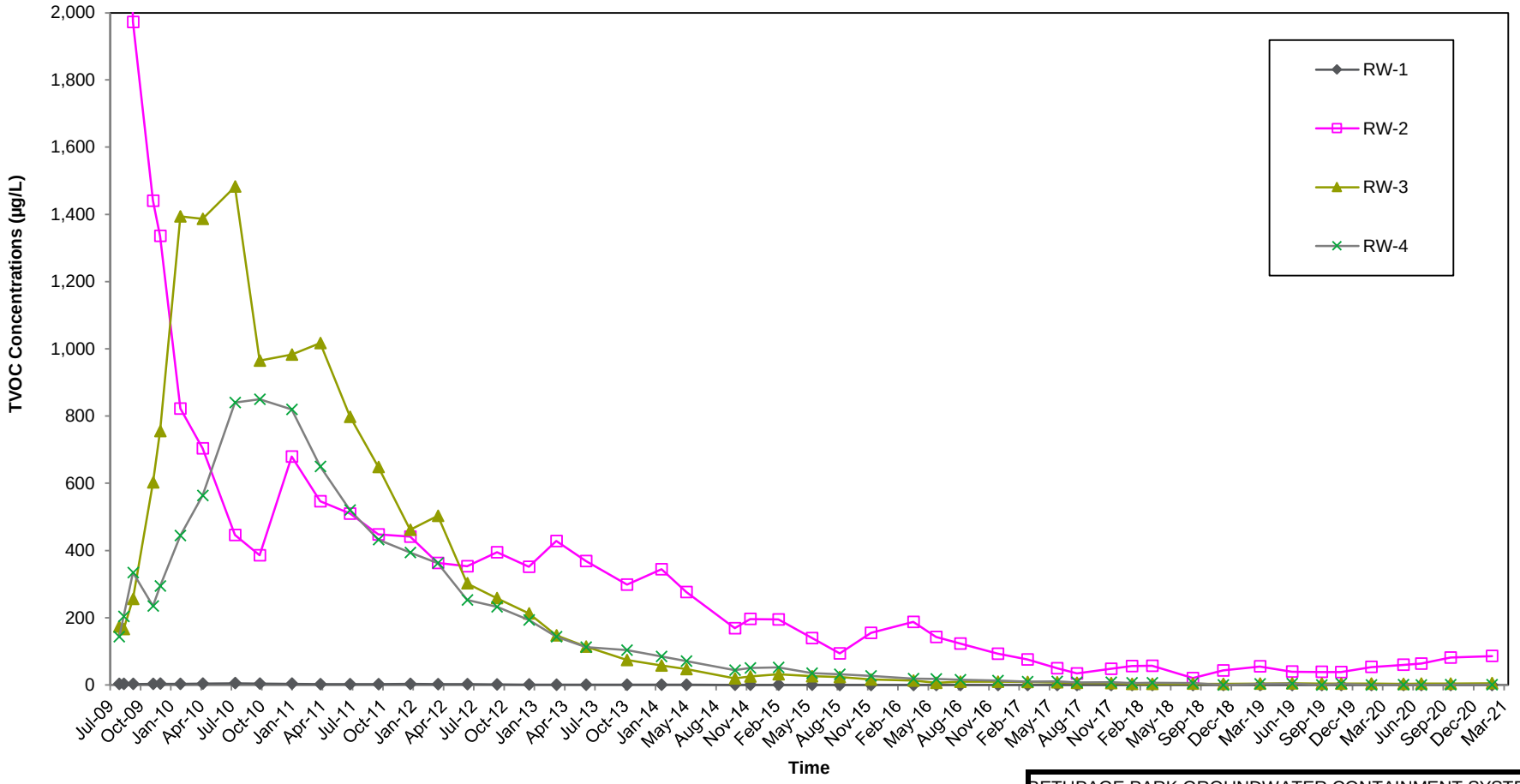
FIGURE
5

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\10 Final Reports-Presentations\OM&M Reports\2021 Q1\Raw Files\Q1_Table 2-8Figure 5 TVOC Mass Graph



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected

1. Results prior to September 10, 2009 are not shown to improve figure clarity. The TVOC concentrations are greater than 2,000 µg/L. See previous reports for full data set.

µg/L = micrograms per liter

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
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BETHPAGE, NEW YORK

REMEDIAL WELL TOTAL VOC CONCENTRATIONS

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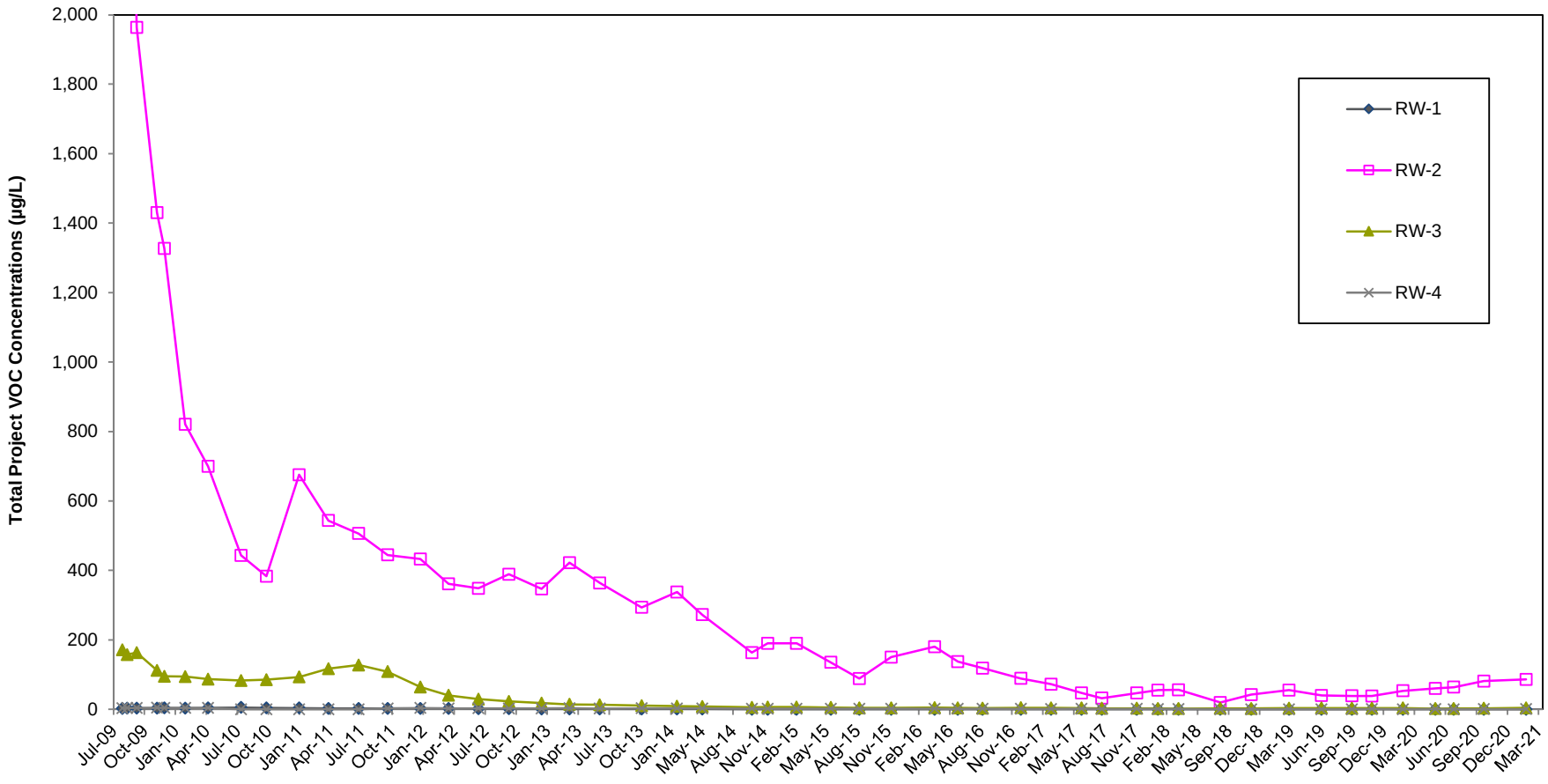
FIGURE
6A



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1. Results prior to September 10, 2009 are not shown to improve figure clarity. Total Project VOC concentrations are greater than 2,000 µg/L. See previous reports for full data set.

µg/L = micrograms per liter

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REMEDIAL WELL PROJECT VOC CONCENTRATIONS

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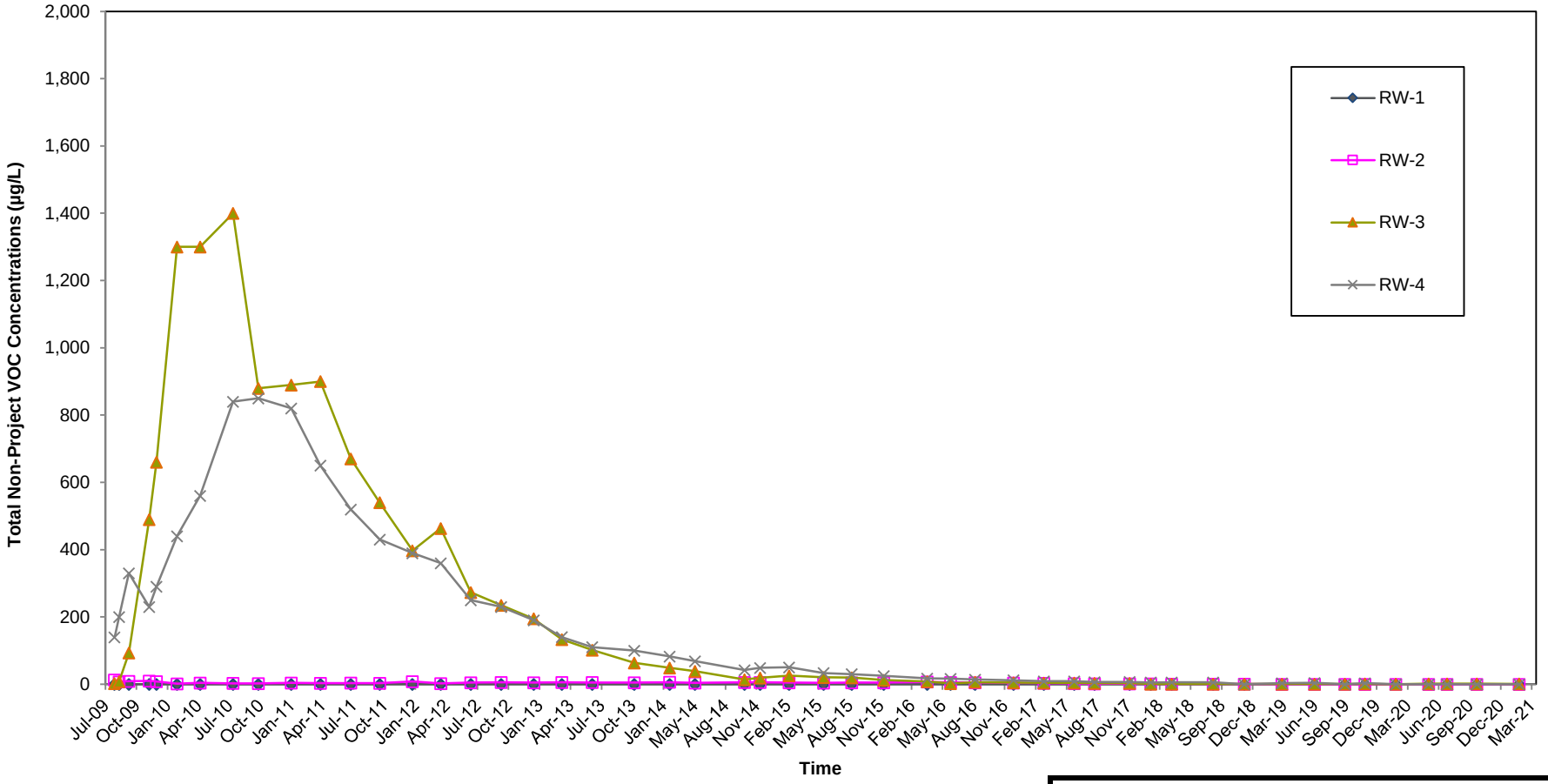
FIGURE
6B

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\10 Final Reports-Presentations\OM&M Reports\2021 Q1\Raw Files\Q1_Table 2-8Figure 6B RW Project VOC



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected.

Non-Project VOCs = sum of TVOCs that are not Project VOCs.

µg/L = micrograms per liter

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
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REMEDIAL WELL NON-PROJECT VOC CONCENTRATIONS

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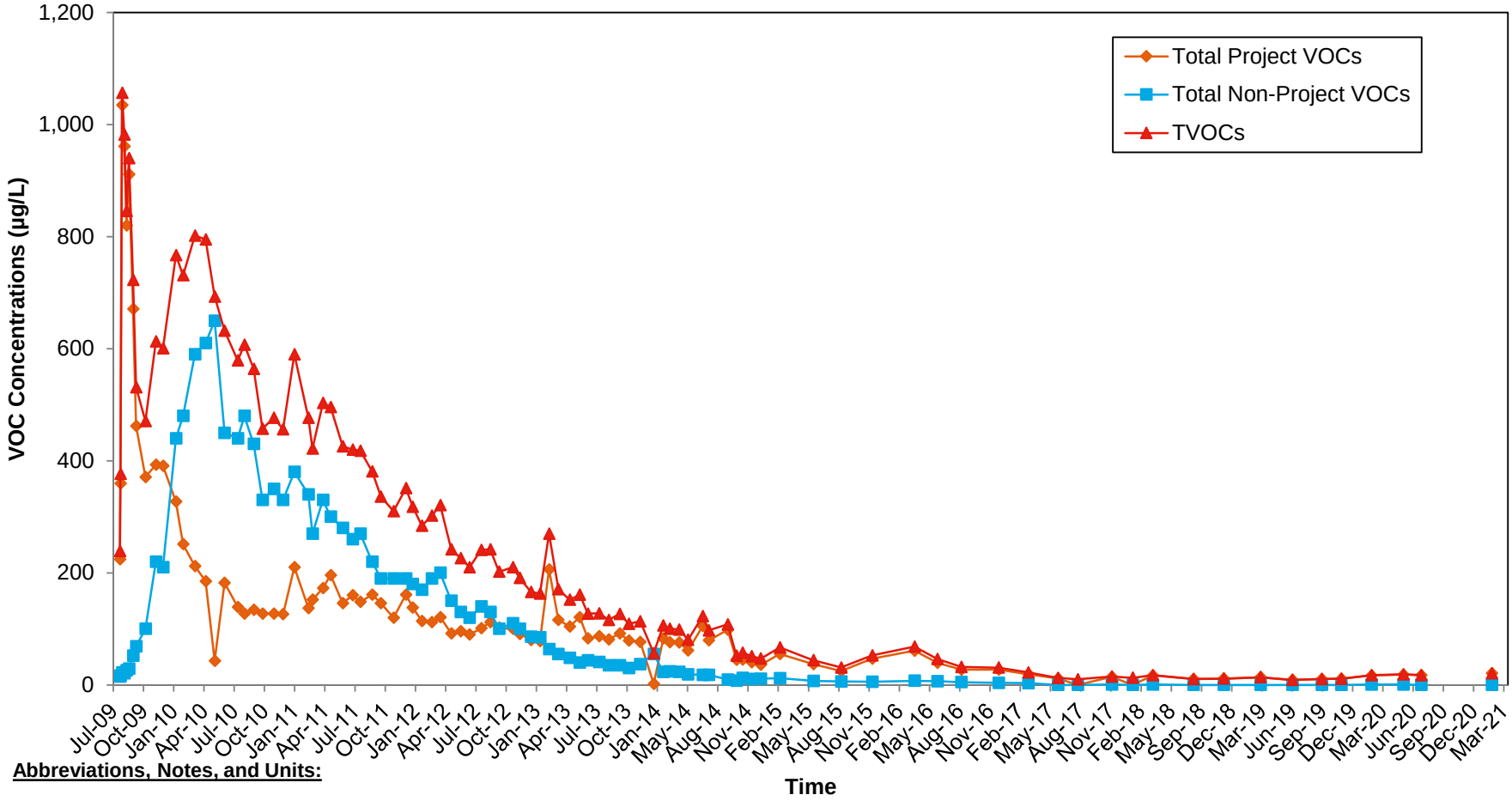
FIGURE
6C



Abbreviations, Notes, and Units:

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Non-Project VOCs = sum of VOCs that are not Project VOCs.
1. Quarter 4 sampling was conducted during ISTR Baker Tank discharge. The combined Influent sample port (WSP-5) is located upstream of the ISTR connection into the influent line. Due to this setup, the combined influent port (WSP-5) was not sampled as it would not be representative of the true combined influent.

µg/L = micrograms per liter

(FORMER GRUMMAN SETTLING PONDS)
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INFLUENT TOTAL, PROJECT AND NON-PROJECT VOC CONCENTRATIONS

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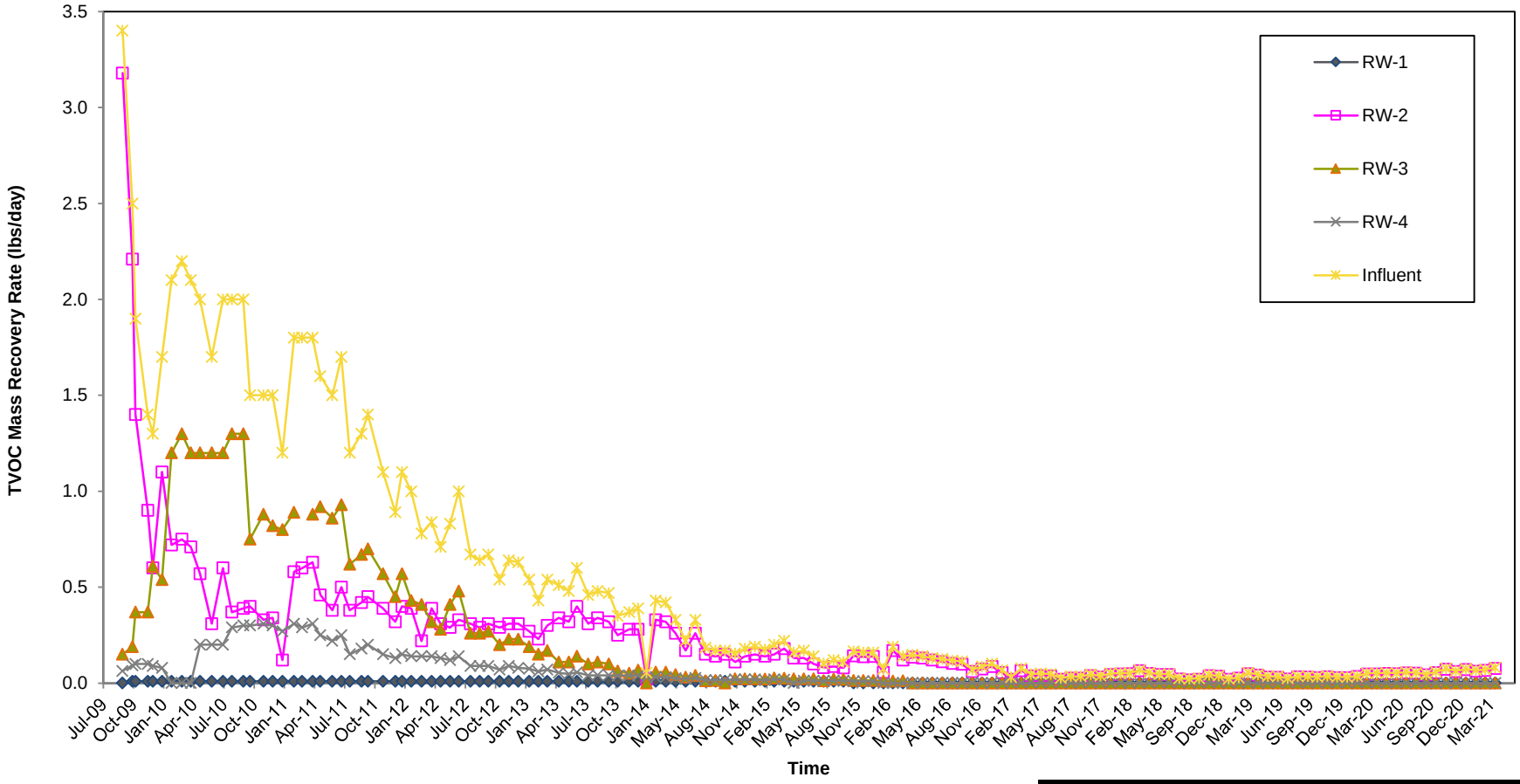
FIGURE 7

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\10 Final Reports-Presentations\OM&M Reports\2021 Q1\Raw Files\Q1_Table 2-8Figure 7 Comb. Inf. VOC Conc.



Abbreviation, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected

lbs/day = pounds per day

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
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TOTAL VOC MASS RECOVERY RATES

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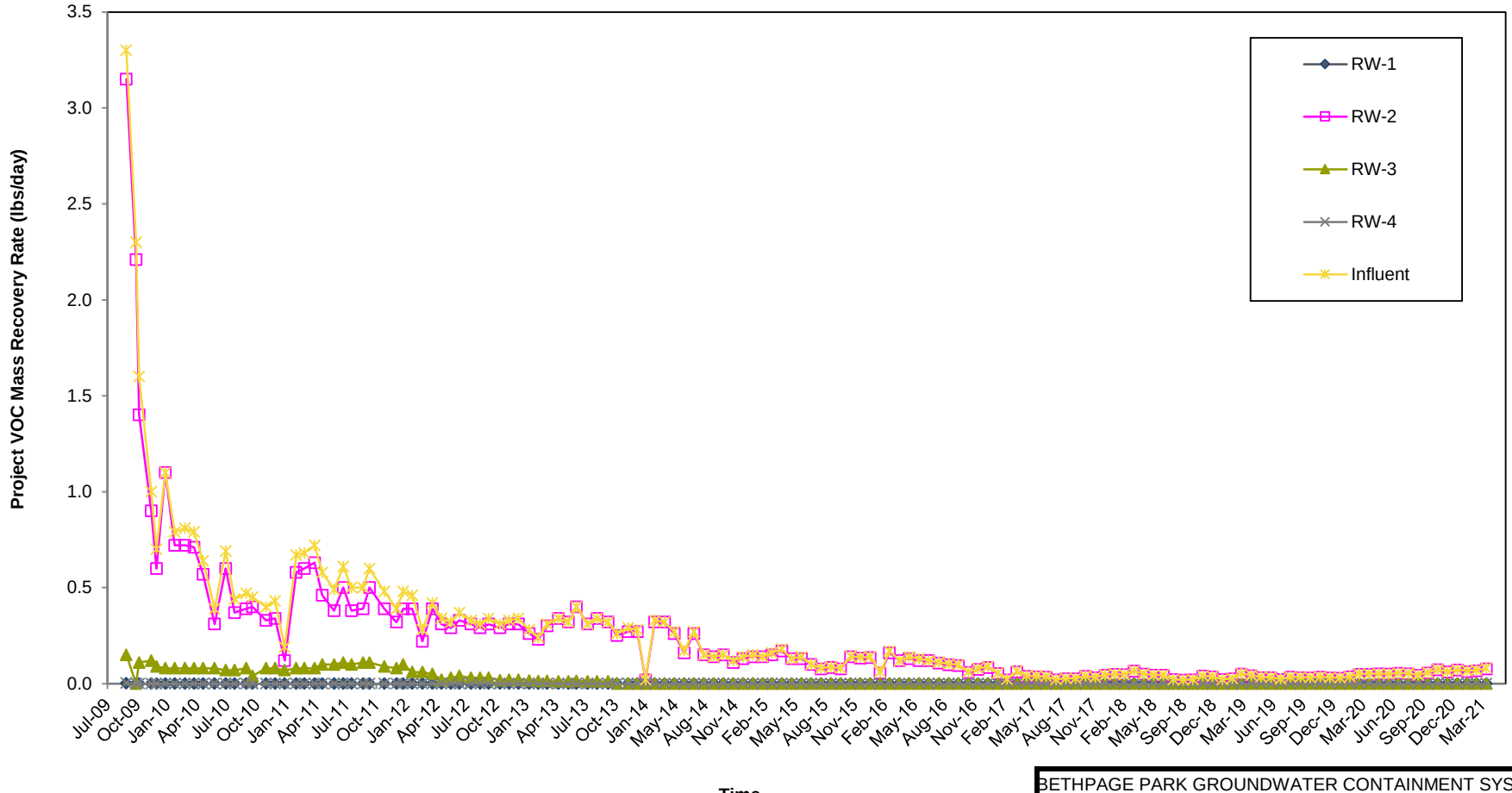
FIGURE
8A

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\10 Final Reports-Presentations\OM&M Reports\2021 Q1\Raw Files\Q1_Table 2-8Figure 8A VOC Recovery Rates



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Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes

lbs/day = pounds per day

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PROJECT VOC MASS RECOVERY RATES

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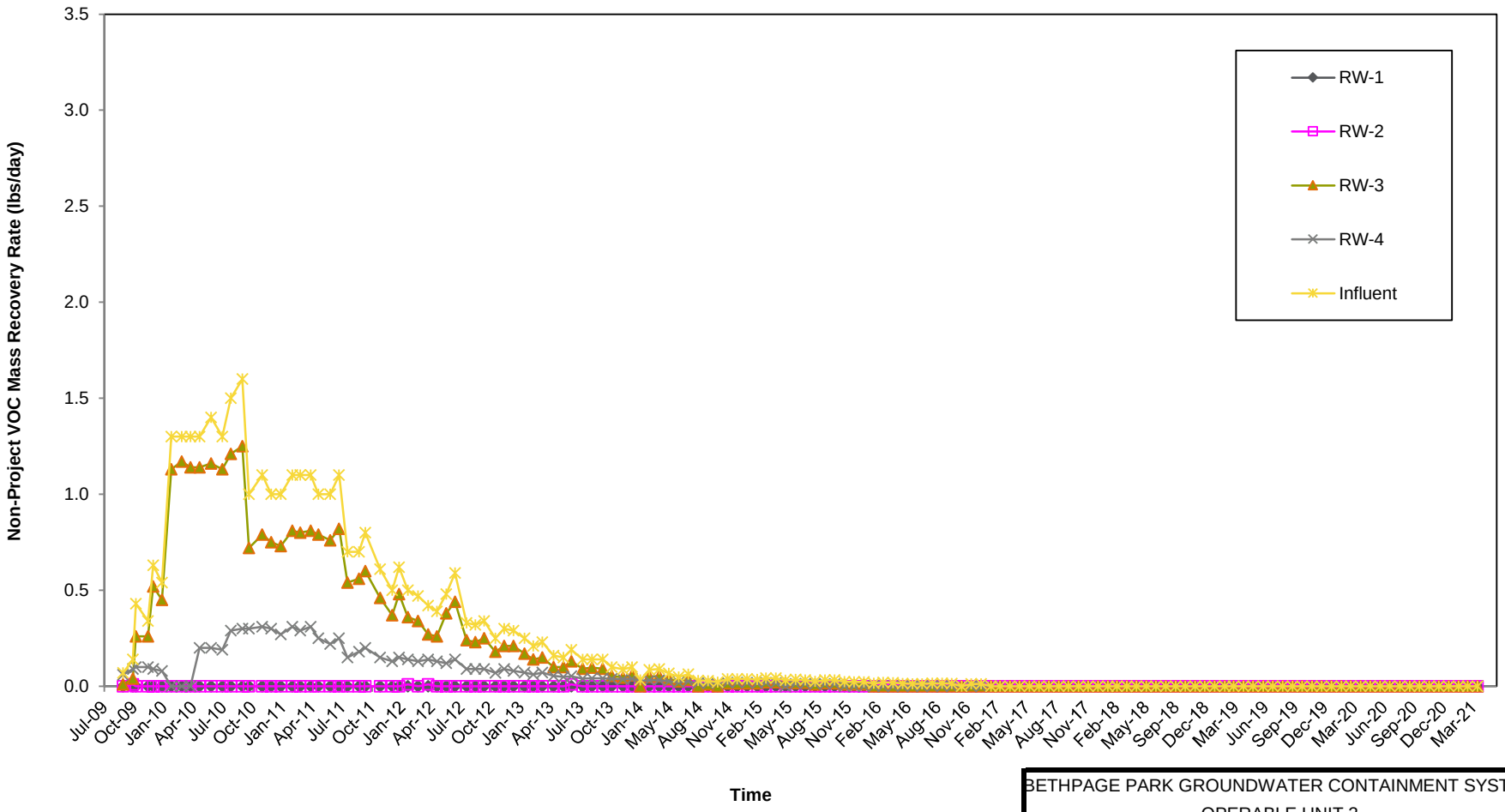
FIGURE
8B

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\10 Final Reports-Presentations\OM&M Reports\2021 Q1\Raw Files\Q1_Table 2-8Figure 8B VOC Recovery Rates



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound

Non-Project VOCs = sum of VOCs that are not Project VOCs.

lbs/day = pounds per day

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NON-PROJECT VOC MASS RECOVERY RATES

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FIGURE
8C

G:\APROJECT\Northrop Grumman Bethpage\OU3.2 Groundwater Containment System\10 Final Reports-Presentations\OM&M Reports\2021 Q1\Raw Files\Q1_Table 2-8Figure 8C VOC Recovery Rates