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Date: August 20, 2025

Our Ref: 30227172.RPTI4

Subject: Results of First Quarter 2025 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 Sarah,

Enclosed is one electronic PDF copy of the First Quarter 2025 Report for the BPGWCS Operation and Monitoring Program, prepared in accordance with the 2013 NYSDEC ROD, 2014 NYSDEC Order on Consent, OM&M Manual (Arcadis 2016) 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.

VOCs have not been detected in the BPGWCS Q1 2025 effluent water samples (Table 3). In addition, the air quality impact analysis (Table 9) shows that none of the detected compounds exceed the 6 NYCRR Part 212-2.2 Table 2 High Toxicity Air Contaminant List annual mass emission limits.

Ms. Sarah A. Johnston
NYSDEC RB

August 20, 2025

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

Sincerely,
Arcadis of New York, Inc.



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Vice President

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Tables

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



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Legend:

	Indicates system online for greater than 18 hours.
	Indicates system operated with reduced flows for 6 hours or greater.
	Indicates system off-line for 6 hours or greater.

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 greater than 18 hours are counted as one day.

Abbreviations/Units:

1Q First Quarter 2025

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 ³ (All Constituent Concentrations in µg/L)	05/15/24	08/07/24	11/13/24	02/12/25
Project VOCs				
1,1,1 - Trichloroethane	< 1.0	<1.0	<1.0	< 1.0
1,1 - Dichloroethane	< 1.0	<1.0	<1.0	< 1.0
1,2 - Dichloroethane	< 1.0	<1.0	<1.0	< 1.0
1,1 - Dichloroethene	< 1.0	<1.0	<1.0	< 1.0
Tetrachloroethene	< 1.0	<1.0	<1.0	< 1.0
Trichloroethene	9.6	11.5	11.9	8.5
Vinyl Chloride	< 1.0	<1.0	0.74 J	0.59 J
cis 1,2-Dichloroethene	10.2	13.5	17.7	11.4
trans 1,2-Dichloroethene	< 1.1	<1.0	<1.0	< 1.0
Benzene	< 0.51	<0.50	<0.50	< 0.50
Toluene	< 1.0	<1.0	<1.0	< 1.0
o-Xylene	< 1.0	<1.0	<1.0	< 1.0
m,p-Xylene	< 1.0	<1.0	<1.0	< 1.0
Subtotal Project VOCs	19.8	25.0	30.3	20.5
Non-Project VOCs				
1,1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Butadiene	< 5.1	< 5.0	< 5.0	< 5.0
2-Butanone	< 11	< 10	< 10	< 10
4-Methyl-2-Pentanone	< 5.1	< 5.0	< 5.0	< 5.0
Acetone	< 11	< 10	< 10	< 10
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	< 5.1	< 5.0	< 5.0	< 5.0
Chloroethane	< 1.1	< 1.0	< 1.0	< 1.0
Chloroform	< 1.0	< 1.0	0.61 J	0.65 J
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 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 ³ (All Constituent Concentrations in µg/L)	05/15/24	08/07/24	11/13/24	02/12/25
Non-Project VOCs				
Dichlorodifluoromethane (Freon 12)	< 2.0	< 2.0	< 2.0	< 2.0
Dichloromethane	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	< 1.1	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone	< 5.1	< 5.0	< 5.0	< 5.0
Methyl Tert-Butyl Ether	< 1.0	< 1.0	< 1.0	< 1.0
Styrene (Monomer)	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane (Freon 11)	< 2.1	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs	ND	ND	0.61	0.65
Total VOCs^{1,4}	20	25	31	21.1
1,4-Dioxane	0.40	0.64	1.45	1.20
pH ²	6.4	6.2	6.1	5.9

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. 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.
4. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells.

VOC Volatile Organic Compound
11.4 Bold value indicates a detection.
 < 1.0 Compound not detected at or above the laboratory quantification limit.
 µg/L micrograms per liter
 J Result is estimated.

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



Compound ⁶ (All Constituent Concentrations in µg/L)	Discharge Limit ¹	04/16/24	05/15/24	06/12/24	07/18/24	08/07/24	09/05/24	10/09/24	11/13/24	12/10/24	01/28/25	02/12/25	03/05/25
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 ⁶ (All Constituent Concentrations in µg/L)	Discharge Limit ¹	04/16/24	05/15/24	06/12/24	07/18/24	08/07/24	09/05/24	10/09/24	11/13/24	12/10/24	01/28/25	02/12/25	03/05/25
Non-Project VOCs													
Acetone	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
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
Ethylbenzene	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
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 ^{3,7}		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 ⁶ (All Constituent Concentrations in µg/L)	Discharge Limit ¹	04/16/24	05/15/24	06/12/24	07/18/24	08/07/24	09/05/24	10/09/24	11/13/24	12/10/24	01/28/25	02/12/25	03/05/25
Inorganics													
Total Iron	600	191	198	1,800	< 100	255	< 100	365	411	283	202	570	108
Total Manganese	600	48.2	43.3	84.8	42.3	40.8	42.1	41.3	38.2	40.4	53.0	54.2	44.4
Nitrate and Nitrite	10,000	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.3	2.4	1.8	2.3	2.0
Total Kjeldahl Nitrogen	10,000	0.27	<0.20	0.43	0.24	< 0.3	0.37	< 0.2	0.53	< 0.2	0.53	< 0.2	< 0.2
Total Nitrogen	10,000	2.6	2.2	2.7	2.5	2.4	2.7	2.4	2.8	2.6	2.3	2.3	2.2
1,4-Dioxane	0.25	0.48	0.28	< 0.24	0.57	0.49	0.47	0.47	< 0.24	0.74	1.00	1.10	< 0.25
Compound ⁶ (All Constituent Concentrations in µg/L)	Discharge Limit ¹	04/16/24	05/15/24	06/12/24	07/18/24	08/07/24	09/05/24	10/09/24	11/13/24	12/10/24	01/28/25	02/12/25	03/05/25
PCBs													
Aroclor 1016	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Aroclor 1221	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Aroclor 1232	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Aroclor 1242	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Aroclor 1248	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.100	< 0.050	< 0.050	< 0.050	< 0.050
Aroclor 1254	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Aroclor 1260	0.095	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
pH ⁵	5.5-8.5	6.6	6.4	6.5	6.7	6.4	6.8	6.8	7.1	6.9	7.1	6.8	6.7

Notes, Abbreviations, Qualifiers, 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. 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.
- 7. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells.
- 8. As of January 2024, LGAC units were implemented following the bag filters to serve as a PCB treatment method as per the SPDES permit equivalency.

SPDES	State Pollutant Discharge Elimination System
VOC	Volatile Organic Compound
LGAC	Liquid-Phase Granular Activated Carbon
2.3	Bold value indicates a detection.
< 1.0	Compound not detected above the laboratory quantification limit.
µg/L	micrograms per liter
ND	Analyte not detected at, or above its laboratory quantification limit.
	Bold box indicates value is greater than discharge criterion.

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



Compound ^{1,3} (All Constituent Concentrations in µg/m ³)	5/15/2024	8/28/2024	11/13/2024	2/12/2025
Project VOCs				
1,1,1 - Trichloroethane	< 0.44	<0.44	< 0.44	< 0.55
1,1 - Dichloroethane	2.1	2.8	2.2	3.0
1,2 - Dichloroethane	< 0.65	<0.65	< 0.65	< 0.81
1,1 - Dichloroethene	0.91	0.83	1.1	0.95
Tetrachloroethene	3.0	2.8	1.7	6.2
Trichloroethene	249	198	163	160
Vinyl Chloride	4.1	2.5	6.9	8.2
cis 1,2-Dichloroethene	157	229	236	219
trans 1,2-Dichloroethene	1.3	1.8	1.9	2.3
Benzene	0.51	2.3	2.6	0.7
Toluene	3.6	2.5	0.72	0.75
o-Xylene	< 0.69	0.74	0.41	< 0.87
m,p-Xylene	< 0.69	1.3	< 0.69	< 0.87
Subtotal Project VOCs	422	445	417	401
Non-Project VOCs				
1,1,1,2,2-Tetrachloroethane	< 0.55	<0.55	<0.55	< 0.69
1,1,1,2-Trichloroethane	< 0.44	<0.44	<0.44	< 0.55
1,2-Dichloropropane	< 0.74	<0.74	<0.74	< 0.92
1,3-Butadiene	< 0.35	<0.35	<0.35	< 0.44
2-Butanone	2.7	8.0	3.5	5.9
4-Methyl-2-Pentanone	4.1	<0.66	<0.66	0.82
Acetone	6.7	26.8	27.8	21
Bromodichloromethane	< 0.54	1.1	< 0.54	0.67
Bromoform	<0.33	<0.33	<0.33	< 0.41
Bromomethane	<0.62	<0.62	<0.62	< 0.78
Carbon Disulfide	<0.50	<0.50	<0.50	< 0.62
Carbon Tetrachloride	<0.20	<0.20	<0.20	< 0.25
Chlorobenzene	<0.74	<0.74	<0.74	< 0.92
Chlorodibromomethane	0.94	1.0	< 0.68	< 0.85
Chlorodifluoromethane (Freon 22)	3.1	<0.56	1.8	1.3
Chloroethane	<0.42	<0.42	<0.42	< 0.53
Chloroform	13	12	4.6	13
Chloromethane	1.1	1.3	1.5	1.7
cis-1,3-Dichloropropene	<0.73	<0.73	< 0.73	< 0.91
Dichlorodifluoromethane (Freon 12)	2.2	1.7	1.8	2.3
Dichloromethane	1.8	4.2	8.7	1.6
Ethylbenzene	<0.69	0.42 J	< 0.69	0.61 J
Methyl N-Butyl Ketone	<0.65	1.2	< 0.66	< 0.82
Methyl Tert-Butyl Ether	0.28 J	<0.58	< 0.58	< 0.72
Styrene (Monomer)	<0.68	<0.68	< 0.68	1.1
trans-1,3-Dichloropropene	<0.73	<0.73	< 0.73	< 0.91
Trichlorofluoromethane (Freon 11)	1.5	1.1	1.2	1.7
Trichlorotrifluoroethane (Freon 113)	2.2	1.5	1.0	1.1
1-Chloro-1,1-difluoroethane (Freon 142b)	<0.66	<0.66	< 0.66	< 0.82
Subtotal Non-Project VOCs	40	60	52	53
Total VOCs²	461	505	468	454

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

Table 4
Summary of 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 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

2.3	Bold value indicates a detection.
< 0.55	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



Compound ^{1,3}	05/15/24	08/28/24	11/13/24	02/12/25
(All Constituent Concentrations in µg/m ³)				
Project VOCs				
1,1,1 - Trichloroethane	< 0.44	<0.44	<0.44	< 0.55
1,1 - Dichloroethane	2.2	2.4	2.1	2.3
1,2 - Dichloroethane	< 0.65	<0.65	< 0.65	< 0.81
1,1 - Dichloroethene	1.3	1.2	1.1	1.3
Tetrachloroethene	0.50	0.36	0.26	0.33
Trichloroethene	17.0	15.0	15.0	15.0
Vinyl Chloride	2.6	1.3	2.8	3.3
cis 1,2-Dichloroethene	115	138	121	130
trans 1,2-Dichloroethene	0.87	1.1	0.95	0.95
Benzene	0.27 J	0.30 J	< 0.51	< 0.64
Toluene	0.45 J	0.83	< 0.60	< 0.75
o-Xylene	< 0.69	< 0.69	< 0.69	< 0.87
m,p-Xylene	< 0.69	< 0.69	< 0.69	< 0.87
Subtotal Project VOCs	140	160	143	153
Non-Project VOCs				
1,1,2,2-Tetrachloroethane	<0.55	<0.55	<0.55	< 0.69
1,1,2-Trichloroethane	<0.44	<0.44	<0.44	< 0.55
1,2-Dichloropropane	<0.74	<0.74	<0.74	< 0.92
1,3-Butadiene	<0.35	<0.35	<0.35	< 0.44
2-Butanone	1.4	21.0	0.44 J	0.41 J
4-Methyl-2-Pentanone	<0.66	<0.66	<0.66	< 0.82
Acetone	13.0	43.5	5.0	5.0
Bromodichloromethane	<0.54	<0.54	<0.54	< 0.67
Bromoform	<0.33	<0.33	<0.33	< 0.41
Bromomethane	<0.62	<0.62	<0.62	< 0.78
Carbon Disulfide	<0.50	<0.50	<0.50	< 0.62
Carbon Tetrachloride	<0.20	<0.20	<0.20	< 0.25
Chlorobenzene	<0.74	<0.74	<0.74	< 0.92
Chlorodibromomethane	<0.68	<0.68	<0.68	< 0.85
Chlorodifluoromethane (Freon 22)	3.5	< 0.56	1.9	1.1
Chloroethane	<0.42	<0.42	<0.42	< 0.53
Chloroform	8.3	7.8	6.3	7.3
Chloromethane	1.5	1.1	0.78	1.1
cis-1,3-Dichloropropene	<0.73	<0.73	<0.73	< 0.91
Dichlorodifluoromethane (Freon 12)	2.6	1.6	1.6	1.8
Dichloromethane	2.1	1.2	1.5	1.1
Ethylbenzene	<0.69	<0.69	< 0.69	< 0.87
Methyl N-Butyl Ketone	<0.65	0.53 J	<0.65	< 0.82
Methyl Tert-Butyl Ether	<0.58	<0.58	<0.58	< 0.72
Styrene (Monomer)	<0.68	<0.68	<0.68	< 0.85
trans-1,3-Dichloropropene	<0.73	<0.73	<0.73	< 0.91
Trichlorofluoromethane (Freon 11)	1.7	1.2	0.96	1.2
Trichlorotrifluoroethane (Freon 113)	<0.61	<0.61	<0.66	< 0.77
1-Chloro-1,1-difluoroethane (Freon 142b)	<0.66	<0.66	<0.65	< 0.82
Subtotal Non-Project VOCs	34.1	77.9	18.5	19.0
Total VOCs^{2,4}	174	238	162	172

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 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
2.3	Bold value indicates a detection.
< 0.55	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 ^{1,3} (All Constituent Concentrations in ppbv)	05/15/24	08/28/24	11/13/24	02/12/25
<u>Tentatively Identified Compounds</u>				
alkane	0.83 J	ND	ND	ND
Total VOC TICs²	0.83	ND	ND	ND

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 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.

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

0.83 Bold value indicates a detection.

ND TIC were not detected.

J Result is estimated.

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



Date ¹	Water Flow Rates (All Flows in gpm) ⁹						Water Pressures (All Pressures in psi)					Air Flow Rate (scfm) ²	Air Pressures (All Pressures in iwc) ^{5,6}					Air Temp. (°R) ⁵
	Remedial Well ²				Combined Influent ³	Effluent ^{2,9}	Remedial Well Effluent ^{2,4}				Effluent ⁵	Effluent	ECU Influent				Effluent	Effluent
	RW-1 ^{7,8}	RW-2	RW-3	RW-4			RW-1	RW-2	RW-3	RW-4			GAC-501	GAC-502	PPZ-601	PPZ-602		
	(gpm)	(gpm)	(gpm)	(gpm)			(psi)	(psi)	(psi)	(psi)			(iwc)	(iwc)	(iwc)	(iwc)		(°R)
04/16/24	29.0	71.7	76.6	28.8	206	260	8	43	39	59	17	1,012	1.5	< 1.0	< 1.0	< 1.0	< 1.0	538
05/15/24	20.1	71.7	76.9	28.0	197	249	8	42	38	60	11	948	1.0	< 1.0	< 1.0	< 1.0	< 1.0	534
06/12/24	30.2	75.8	77.7	29.9	214	261	8	30	35	58	18	1,044	2.0	< 1.0	< 1.0	< 1.0	< 1.0	546
07/18/24	20.8	76.5	78.1	29.7	205	266	8	28	37	59	26	1,012	1.5	< 1.0	< 1.0	< 1.0	< 1.0	543
08/07/24	19.4	76.3	77.9	29.6	203	258	8	28	37	58	18	1,000	1.5	< 1.0	< 1.0	< 1.0	< 1.0	540
09/05/24	18.4	77.0	75.6	30.7	202	245	8	25	42	57	16	1,205	3.0	< 1.0	< 1.0	< 1.0	< 1.0	543
10/09/24	17.0	74.6	76.6	30.5	199	244	6	28	41	57	6	1,240	3.0	< 1.0	< 1.0	< 1.0	1.0	532
11/13/24	15.9	74.1	73.3	29.8	193	259	5	31	46	57	15	1,258	2.5	< 1.0	< 1.0	< 1.0	< 1.0	524
12/10/24	13.9	72.3	75.7	29.4	191	247	6	33	43	58	11	1,131	2.5	< 1.0	< 1.0	< 1.0	1.0	524
01/28/25	12.9	59.2	76.4	0.0	148	192	5	63	43	0	9	1,135	2.5	< 1.0	< 1.0	< 1.0	< 1.0	520
02/12/25	12.4	59.9	74.4	30.3	177	221	6	59	49	57	10	1,147	2.5	< 1.0	< 1.0	< 1.0	< 1.0	516
03/05/25	11.5	79.4	69.6	30.2	191	232	7	19	64	57	12	1,118	2.0	< 1.0	< 1.0	< 1.0	< 1.0	524

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.
6. Pressure readings recorded as < 1.0 iwc due to pressure being too low for gauge sensitivity.
7. As of August 4, 2022 the RW-1 flow rate presented includes the combined flow rates from wells BCPMW-4-1 and BCPMW-4-2 as additional recovery wells.
8. The reduction in flow in RW-1 from 2024 to 2025 is due to reduced flow from BCPMW-4-1. The pump will be worked on to raise the total flow to the design flow rate.
9. The effluent flow rate is typically greater than the combined influent due to the air stripper level set point. The effluent flow will exceed the influent flow to maintain a set water level in the air stripper.

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
°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



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 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 Totals⁴	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	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	<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	<0.01	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	0.03	<0.01	0.35	<0.01	<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	0.01	<0.01	0.31	<0.01	<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	0.016	47	6.1	3.9	60	0.009	48	1.4	0.20	49	<0.01	1.9	4.7	3.7	10	<0.01	0.13	0.017	0.011	0.16	<0.01	0.13	<0.01	<0.01	0.12	<0.01	<0.01	0.013	0.010	0.028	
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	31,610	37,614	15,965	101,184	<0.01	14	1.9	1.1	17	<0.01	13	1.0	0.13	14	<0.01	0.47	0.9	0.9	2.3	<0.01	0.038	<0.01	<0.01	0.046	<0.01	0.036	<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	36,416	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	0.004	0.034	0.05	<0.01	<0.01	<0.01	<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	0.002	0.055	0.06	<0.01	<0.01	<0.01	<0.01	
2021 Totals	14,490	36,403	36,153	15,324	104,370	<0.01	171.4	1.9	0.05	173.3	<0.01	167.7	1.14	<0.01	168.9	<0.01	3.6	0.75	0.11	4.49	<0.01	1.865	<0.01	<0.01	1.886	<0.01	1.825	<0.01	<0.01	1.899	<0.01	0.04	<0.01	<0.01	0.0470	
2022 Totals	12,224	36,802	38,231	15,238	102,495	45	53	15	<0.01	112.3	43.3	51.2	13.1	<0.01	107.6	1.7	1.3	1.6	0.1	4.8	0.5	0.6	0.2	<0.01	1.2	0.5	0.6	0.1	<0.01	1.2	0.53	0.02	0.01	<0.01	0.04	
2023 Totals	13,740	33,732	37,815	15,084	100,372	4.75	12.97	8.90	<0.01	46.88	24.89	12.97	8.47	<0.01	46.3	0.1	<0.01	0.3	<0.01	0.4	0.1	0.14	0.10	<0.01	0.51	0.27	0.14	0.09	0.01	0.51	0.09	<0.01	<0.01	<0.01	<0.01	<0.01
2024 Totals	10,572	36,206	34,287	24,464	105,530	9	24	20	17	70	9	24	20	17	70	<0.01	<0.01	<0.01	<0.01	<0.01	0.066	0.137	0.142	0.135	0.480	0.066	0.137	0.137	0.135	0.597	<0.01	<0.01	<0.01	<0.01	<0.01	
January through March 2025																																				
01/01/25 - 02/01/25	565	2,702	3,300	937	7,504	0.6	2.7	3.3	0.9	7.43	0.6	2.7	3.3	0.9	7.4	<0.01	<0.01	<0.01	<0.01	0.000	0.018	0.086	0.105	0.030	0.240	0.018	0.086	0.105	0.030	0.240	<0.01	<0.01	<0.01	<0.01	<0.01	
02/01/25 - 03/01/25	446	2,216	2,997	650	5,909	0.4	2.2	2.6	0.6	5.85	0.4	2.2	2.6	0.6	5.9	<0.01	<0.01	<0.01	<0.01	0.000	0.016	0.078	0.092	0.023	0.209	0.016	0.078	0.092	0.023	0.209	<0.01	<0.01	<0.01	<0.01	<0.01	
03/01/25 - 04/01/25	371	2,490	2,182	986	6,029	0.4	2.5	2.2	1.0	5.97	0.4	2.5	2.2	1.0	6.0	<0.01	<0.01	<0.01	<0.01	0.000	0.012	0.080	0.070	0.031	0.193	0.012	0.080	0.070	0.031	0.193	<0.01	<0.01	<0.01	<0.01	<0.01	
Subtotal Jan - Mar 2025	1,382	7,408	8,079	2,573	19,442	1.4	7.34	8.00	2.55	19.25	1.4	7.3	8.00	2.6	19.3	<0.01	<0.01	<0.01	<0.01	<0.01	0.015	0.082	0.089	0.028	0.214	0.015	0.082	0.089	0.028	0.214	<0.01	<0.01	<0.01	<0.01	<0.01	
2025 Totals	1,382	7,408	8,079	2,573	19,442	1.4	7.3	8.0	2.5	19.3	1.4	7.3	8.0	2.6	19.3	<0.01	<0.01	<0.01	<0.01	<0.01	0.015	0.082	0.089	0.028	0.214	0.015	0.082	0.089	0.028	0.214	<0.01	<0.01	<0.01	<0.01	<0.01	
Total Since System Start Up	229,766	552,487	573,385	249,275	1,604,913	61	1,318	969	275	2,645	80	1,305	157	21	1,564	2	16	811	253	1,075	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

Notes, Abbreviations, Qualifiers, and Units:

- Represents operating period between consecutive monitoring events.
- 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.
- 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.
- 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.
- "Total VOCs" represents the sum of individual weight in pounds of the VOCs detected.
- "Project VOCs" represents the sum of individual compound weight in pounds of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethylene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m,p.
- "Non-Project VOCs" represents the difference between Total VOCs and Project VOCs.
- Values based on operational data recorded prior to system startup on July 21, 2009.
- As of August 4, 2022 the RW-1 mass recovered is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells.

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

Table 9
2025 Rule 212 Evaluation
Bethpage Park Soil Gas Containment System, Groundwater Containment System, and ISTR
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman,
Bethpage, New York

Project VOCs	CAS#	HTAC? ¹	2025 BPGWCS Maximum Effluent Conc. (ug/m3) ^{2,8}	2025 BPSGCS Maximum Effluent Conc. (ug/m3) ^{2,5,8}	2025 Phase 2 ISTR Maximum Effluent Conc. (ug/m3) ^{2,8}	2025 BPGWCS Emissions (lb/yr) ⁴	2025 BPSGCS Emissions - not combined with ISTR (lb/yr) ⁴	2025 BPSGCS Emissions - combined with ISTR (lb/yr) ⁴	Facility Wide Emissions (lb/yr) ⁵	Rule 212 Emission Limit (lb/yr) ⁶	Further evaluation Required? ⁷
1,1,1-Trichloroethane	71-55-6	No		1.4		0.000	0.312	0.000	0.312	100	N
1,1 - Dichloroethane	75-34-3	No	2.3	3.5		0.086	0.780	0.000	0.867	100	N
1,1 - Dichloroethene	75-35-4	No	1.3	8.3		0.049	1.850	0.000	1.899	100	N
Benzene	71-43-2	Yes		2.1	1.29	0.000	0.468	0.004	0.473	100	N
cis- 1,2-Dichloroethene	156-59-2	No	130	113	1.01	4.882	25.193	0.003	30.079	100	N
Tetrachloroethene	127-18-4	Yes	0.33	4.3		0.012	0.959	0.000	0.971	1000	N
Toluene	108-88-3	No			9.76	0.000	0.000	0.034	0.034	100	N
trans- 1,2-Dichloroethene	156-60-5	No	0.95	13		0.036	2.898	0.000	2.934	100	N
Trichloroethene	79-01-6	Yes	15.0	704	9.05	0.563	156.956	0.031	157.551	500	N
Vinyl Chloride	75-01-4	Yes	3.3	4.6	110	0.124	1.026	0.379	1.529	100	N
Xylenes ³	1330-20-7	No			6.34	0.000	0.000	0.022	0.022	100	N
Non-Project VOCs											
1,1,2-Trichlorotrifluoroethane	76-13-1	No				0.000	0.000	0.000	0.000	100	N
1,2,4-Trimethylbenzene	95-63-6	No				0.000	0.000	0.000	0.000	100	N
1,3,5-Trimethylbenzene	108-67-8	No				0.000	0.000	0.000	0.000	100	N
2,2,4-Trimethylpentane	540-84-1	No			2.08	0.000	0.000	0.007	0.007	100	N
2-Butanone (MEK)	78-93-3	No			7.11	0.000	0.000	0.025	0.025	100	N
2-Propanol	67-63-0	No			241	0.000	0.000	0.831	0.831	100	N
4-Ethyltoluene	622-96-8	No				0.000	0.000	0.000	0.000	100	N
Cyclohexane	110-82-7	No			0.933	0.000	0.000	0.003	0.003	100	N
Ethanol	64-17-5	No			488.0	0.000	0.000	1.682	1.682	100	N
Heptane	142-82-5	No			1.84	0.000	0.000	0.006	0.006	100	N
Isopropylbenzene	98-82-8	No				0.000	0.000	0.000	0.000	100	N
Methyl methacrylate	80-62-2	No			1.09	0.000	0.000	0.004	0.004	100	N
n-Hexane	110-54-3	No			3.63	0.000	0.000	0.013	0.013	100	N
Propene	115-07-1	No			183	0.000	0.000	0.631	0.631	100	N
Tetrahydrofuran	109-99-9	No				0.000	0.000	0.000	0.000	100	N
1-Chloro-1,1-difluoroethane (Freon 142B)	75-68-3	No		20		0.000	4.459	0.000	4.459	100	N
2-Butanone	78-93-3	No	0.41	1.4		0.015	0.312	0.000	0.328	100	N
Acetone	67-64-1	No	5.0		47.5	0.188	0.000	0.164	0.351	100	N
Carbon Disulfide	75-15-0	No			7	0.000	0.000	0.024	0.024	100	N
Chlorodifluoromethane (Freon 22)	75-45-6	No	1.1	0.70		0.041	0.156	0.000	0.197	100	N
Chloroethane	75-00-3	No				0.000	0.000	0.000	0.000	100	N
Chloromethane	74-87-3	No	1.1		94.6	0.041	0.000	0.326	0.367	100	N
Chloroform	67-66-3	Yes	7.3	8.3		0.274	1.850	0.000	2.125	100	N
Dichlorodifluoromethane (Freon 12)	75-71-8	No	1.8	1.7	4.61	0.068	0.379	0.016	0.463	100	N
Ethylbenzene	100-41-4	No			1.23	0.000	0.000	0.004	0.004	100	N
Methylene Chloride	75-09-2	No	1.1	1.4	30.5	0.041	0.312	0.105	0.459	100	N
Styrene (Monomer)	100-42-5	No				0.000	0.000	0.000	0.000	100	N
Trichlorofluoromethane (Freon 11)	75-69-4	No	1.2	1.1		0.045	0.245	0.000	0.290	100	N
Trichlorotrifluoroethane (Freon 113)	76-13-1	No				0.000	0.000	0.000	0.000	100	N

Footnotes on next page

Table 9
 2025 Rule 212 Evaluation
 Bethpage Park Soil Gas Containment System, Groundwater Containment System, and ISTR
 Operable Unit 3 (Former Grumman Settling Ponds)
 Northrop Grumman,
 Bethpage, New York



Flowrates	
Description	Flow (cfm)
BPGWCS	1,147
BPSGCS	6,809
ISTR Phase 2	340

Notes:

1. High toxicity air contaminant (HTAC) based on 6 CRR-NY Rule 212-2.2, Table 2 – high toxicity air contaminant list.
2. Maximum effluent concentrations for soil gas effluent from VSP-601, GW vapor from VSP-05, and treated vapor from deep vapor extraction wells in ISTR Treatment Area 3 and 4 based on sampling performed in 2025. Compounds not detected above the laboratory reporting limit are excluded from the air quality impact analysis summary.
3. Total for xylenes m, o, and P.
4. Emission rate calculated based on maximum effluent concentration and maximum air flow rates measured during the sampling events. Emission rate standardized at 70 °F and 1 atm.
 e.g., $\text{TCE (lb/yr)} = \text{TCE } [\mu\text{g}/\text{m}^3] \times \text{Air Flow Rate } [\text{ft}^3/\text{min}] \times (1 \text{ m}^3/35.3147 \text{ ft}^3) \times (60 \text{ min/hr}) \times (0.000001 \text{ g}/1 \mu\text{g}) \times (0.0022 \text{ lb/g}) \times 8,760 \text{ hrs/yr}$
5. Combined 2024 emissions from shallow horizontal wells in ISTR Treatment Area 4 and soil gas containment systems. The Phase 2 ISTR system was started up on September 10, 2024.
6. 100 lb/yr for non-HTACs, and mass emission limits based on Rule 212-2.2, Table 2 for HTACs.
7. For HTACs, no further demonstration (i.e., comparison to SGCS, AGCs, or air modeling) is required if the actual facility-wide emissions are less than mass emission limit. For non-HTACs, no further demonstration is required if the actual facility-wide emissions are less than 100 lbs/yr.
8. Blank cell indicates that the compound was not detected above its laboratory quantification limit.

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



Compond1 (All Constitent Concentrations in µg/L)	Sample Location: Sample Date:	RW-1 5/15/2024	RW-1 8/7/2024	RW-1 11/13/2024	RW-1 2/12/2025	RW-2 5/15/2024	RW-2 8/7/2024	RW-2 11/13/2024	RW-2 2/12/2025	RW-3 2/22/2024	RW-3 5/15/2024	RW-3 8/7/2024	RW-3 11/13/2024	RW-3 2/12/2025	RW-4 5/15/2024	RW-4 8/7/2024	RW-4 11/13/2024	RW-4 2/12/2025
Project VOCs	NYSDEC SCGs																	
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	<1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	0.84 J	0.74 J	< 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-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	<1.0
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	<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	<1.0
Trichloroethylene	5	30.0	44.5	57.0	46.6	6.8	12.7	12.9	12.1	6.5	5.6	3.4	0.97 J	2.2	< 1.0	< 1.0	<1.0	<1.0
Vinyl Chloride	2	0.61 J	1.5	4.6	5.9	0.61 J	< 1.0	<1.0	0.56 J	< 1.0	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 1.0	<1.0	<1.0
cis-1,2-dichloroethene	5	24.4	49.5	85.9	65.0	10.5	16.0	19.0	18.3	6.0	6.0	2.9	0.61 J	1.5	< 1.0	< 1.0	<1.0	<1.0
trans-1,2-dichloroethene	5	< 1.0	< 1.0	0.86 J	0.60 J	< 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	<0.50
Tolene	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	<1.0
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	<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	<1.0
Subtotal Project VOCs		55.0	95.5	149.2	119	17.9	28.7	31.9	31.0	12.5	11.6	6.3	1.6	3.7	ND	ND	ND	ND
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	<1.0
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	<1.0
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	<1.0
1,3-Btadiene	0.5	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	<5.0	<5.0	< 1.0	< 1.0	< 1.0	<5.0	<5.0	< 1.0	< 1.0	<5.0	<5.0
2-Btanone	NE	< 10	< 10	<10	<10	< 10	< 10	<10	<10	< 1.0	< 1.0	< 1.0	<10	<10	< 1.0	< 1.0	<10	<10
4-methyl-2-pentanone	50	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	<5.0	<5.0	< 1.0	< 1.0	< 1.0	<5.0	<5.0	< 1.0	< 1.0	<5.0	<5.0
Acetone	NE	< 10	< 10	<10	<10	< 10	< 10	<10	<10	< 1.0	< 1.0	< 1.0	<10	<10	< 1.0	< 1.0	<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	<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	<1.0
Bromomethane	5	< 2.0	< 2.0	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	< 1.0	< 1.0	< 1.0	<2.0	<2.0	< 1.0	< 1.0	<2.0	<2.0
Carbon Dislfide	60	< 2.0	< 2.0	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	< 1.0	< 1.0	< 1.0	<2.0	<2.0	< 1.0	< 1.0	<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	<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	<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	<1.0
Chlorodifloromethane (Freon 22)	NE	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	<5.0	<5.0	< 1.0	< 1.0	< 1.0	<5.0	<5.0	< 1.0	< 1.0	<5.0	0.78 J
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	<1.0
Chloroform	7	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 1.0	0.86 J	1.1	1.0	< 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	<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	<1.0
Dichlorodifloromethane (Freon 12)	5	< 2.0	< 2.0	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	< 1.0	< 1.0	< 1.0	<2.0	<2.0	< 1.0	< 1.0	<2.0	<2.0
Dichloromethane	5	< 2.0	< 2.0	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	< 1.0	< 1.0	< 1.0	<2.0	<2.0	< 1.0	< 1.0	<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	<1.0
Methyl N-Btyl Ketone	50	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	<5.0	<5.0	< 1.0	< 1.0	< 1.0	<5.0	<5.0	< 1.0	< 1.0	<5.0	<5.0
Methyl tert-Btyl 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	<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	<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	<1.0
Trichlorofloromethane (Freon 11)	5	< 2.0	< 2.0	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	< 1.0	< 1.0	< 1.0	<2.0	<2.0	< 1.0	< 1.0	<2.0	<2.0
Trichlorotrifloroethane (Freon 113)	5	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	<5.0	<5.0	< 1.0	< 1.0	< 1.0	<5.0	<5.0	< 1.0	< 1.0	<5.0	<5.0
1-Chloro-1,1-difloroethane (Freon 142b)	NE	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	<5.0	<5.0	< 1.0	< 1.0	< 1.0	<5.0	<5.0	< 1.0	< 1.0	<5.0	<5.0
Subtotal Non-Project VOCs		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.86	1.1	1.0	ND	ND	ND	0.78
Total VOCs ^{2,3,4}		55.0	95.5	149.2	119	17.9	28.7	31.9	31.0	12.5	11.6	7.2	2.7	4.7	ND	ND	ND	0.8
1,4-Dioxane		1.40	2.00	7.30	8.6	0.34	0.29	< 0.24	< 0.25	< 0.24	0.34	0.29	< 0.24	< 0.26	0.26	0.16 J	< 0.24	< 0.25

Notes, Abbreviations, Qalifiers, 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:

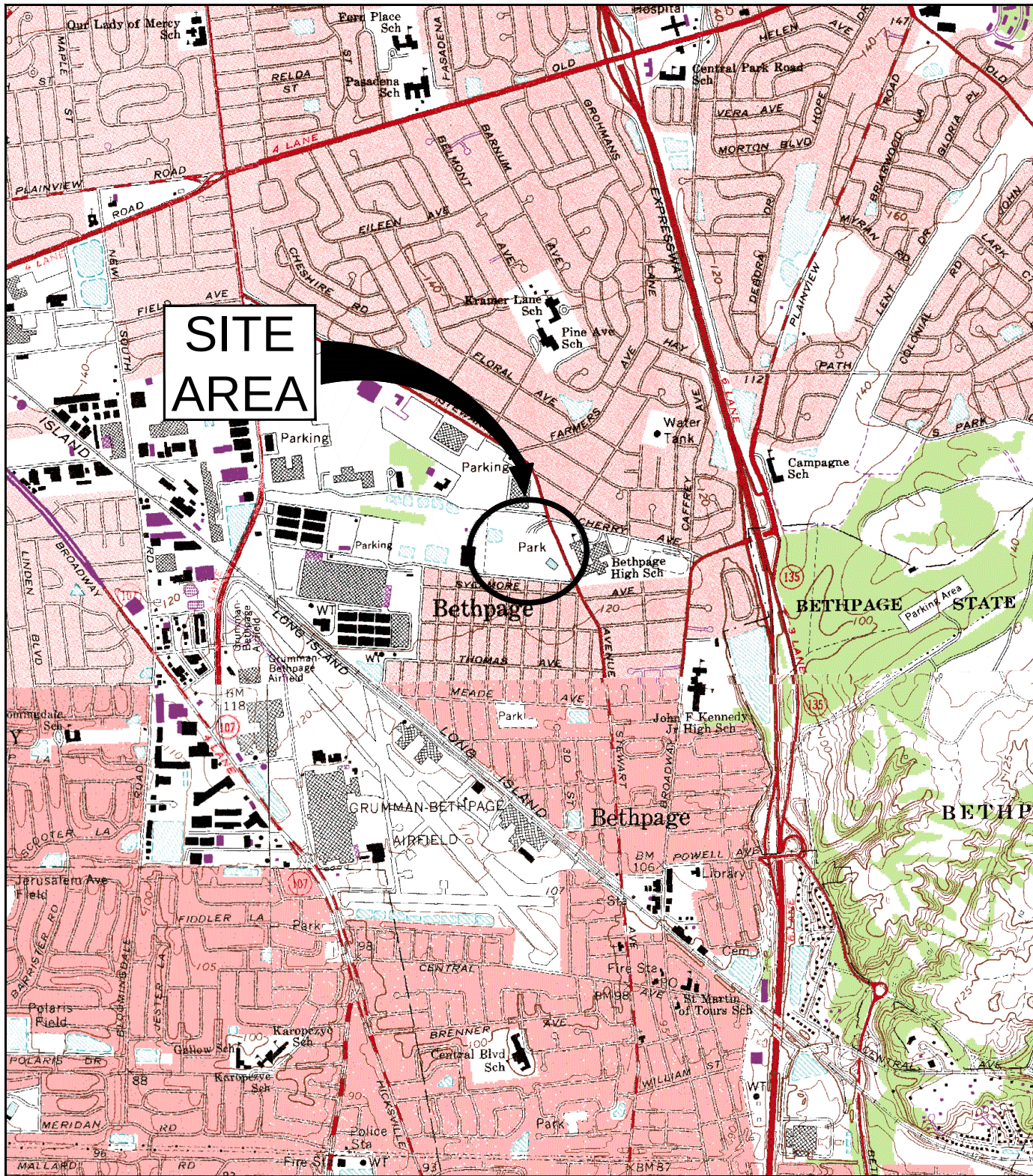
- 1. Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analysis per USEPA Method 8260C (after September 1, 2014). Results validated following protocols specified in Sampling and Analysis Plan in the Bethpage Park Groundwater Containment System OM&M Manual (Arcadis 2016). See previous quarterly reports for historical analytical reslts.
- 2. "Total VOCs" represents the sum of individual concentrations of the VOCs detected.
- 3. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells.

ELAP	Environmental Laboratory Approval Program
NE	Not Established
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
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
5.9	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
ND	Analyte not detected at, or above its laboratory quantification limit.
µg/L	micrograms per liter

Figures

CITY:SYRACUSE,NY DIV:GROUP:PEW DB:A.SANCHEZ LD: PIC:OpM PM:RefM TM:OpM LVR:OpMONE=OFF=REF
 G:\ENV\CAD\STRACUSE\ACT\001496\ILL\HOMM\REF\1496_B01.dwg LAYOUT: BETHPAGE PARK SAVED: 11/11/2015 4:51 PM ACADVER: 19.1S (LMS TECH) PAGES: 19.1S (LMS TECH) PLOTSTYLE: TABLE: PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY



SOURCE:
 USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, N.Y., 1994, FREEPORT QUADRANGLE, FREEPORT, N.Y., 1994,
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NEW YORK



0 2000' 4000'
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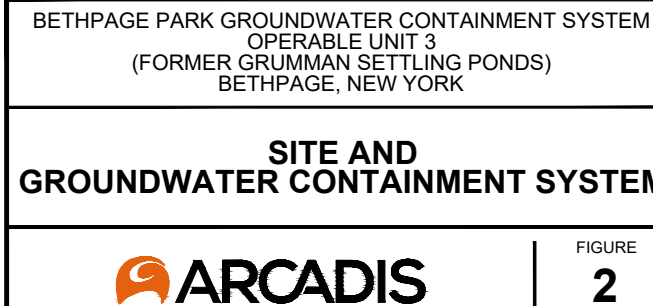
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 OPERABLE UNIT 3
 (FORMER GRUMMAN SETTLING PONDS)
 BETHPAGE, NEW YORK

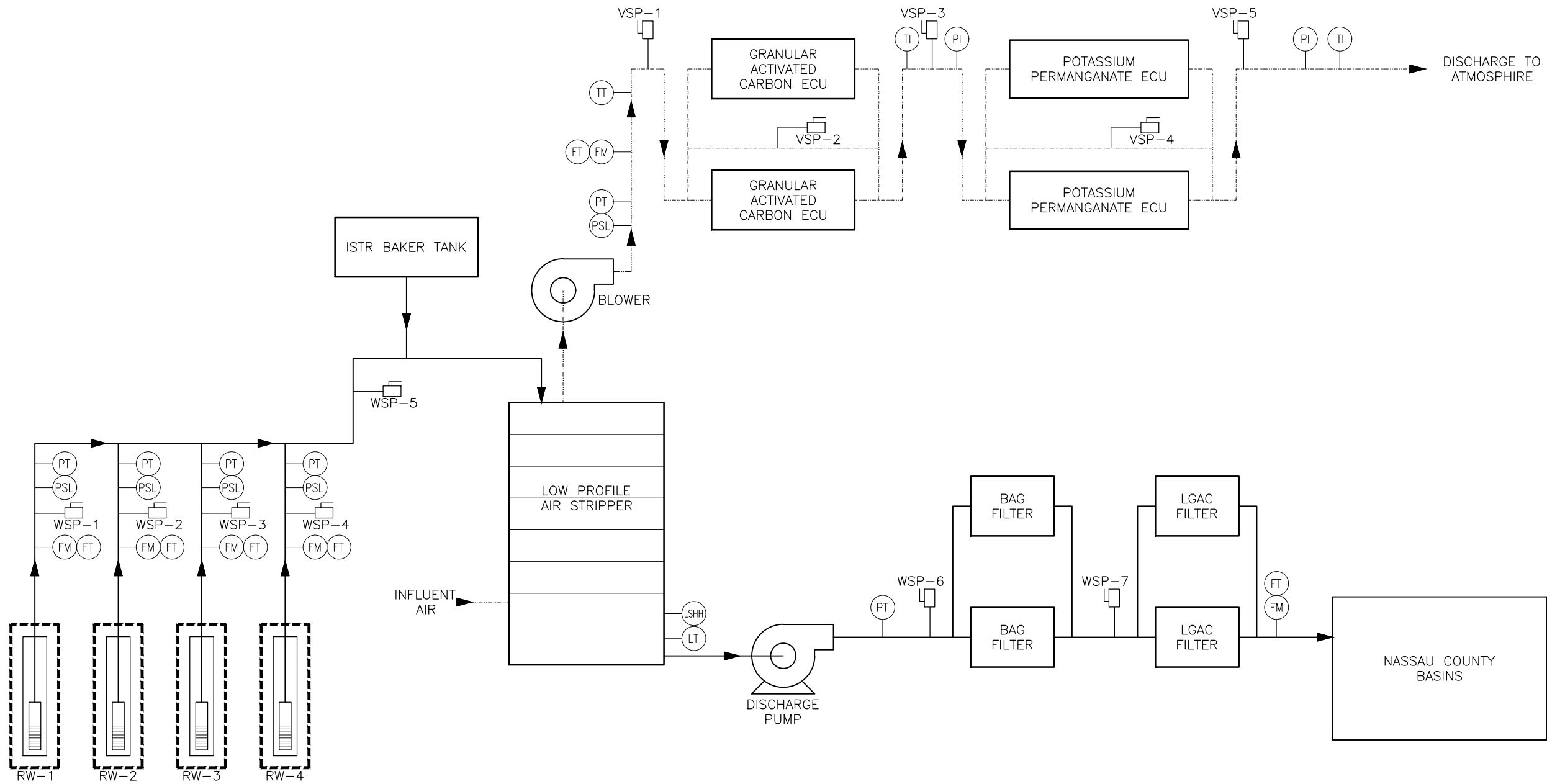
SITE LOCATION

ARCADIS

FIGURE

1



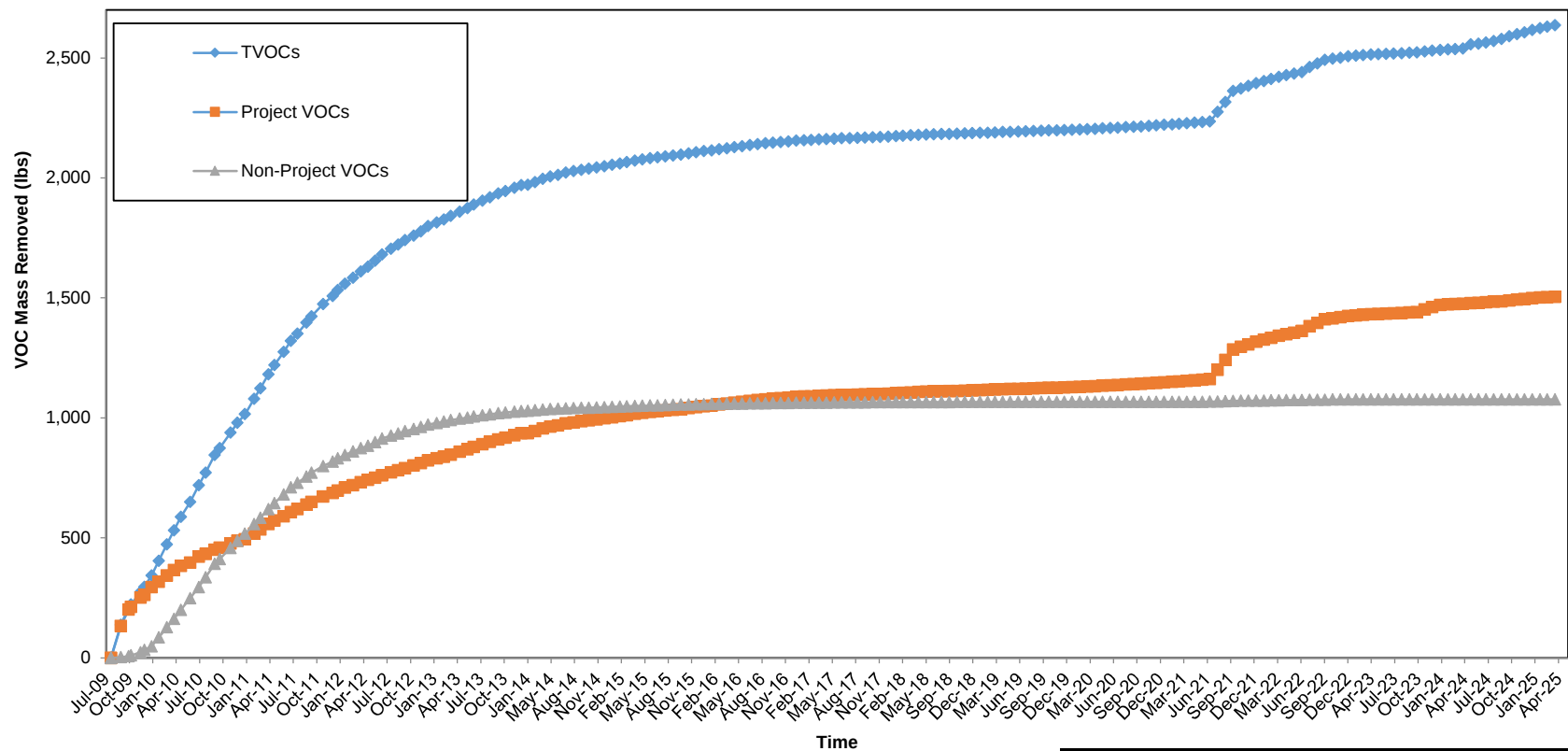


- LEGEND:**
- PROCESS WATER
 - PROCESS AIR
 - INSTRUMENT
 - SAMPLE PORT
 - FLOW DIRECTION
 - FM FLOW METER
 - FT FLOW RATE TRANSMITTER
 - PSL PRESSURE VACUUM LOW
 - PT PRESSURE TRANSMITTER
 - PI PRESSURE INDICATOR
 - LSHH LEVEL SWITCH HIGH HIGH
 - LT LEVEL TRANSMITTER
 - TT TEMPERATURE TRANSMITTER
 - TI TEMPERATURE INDICATOR
 - WSP WATER SAMPLE PORT
 - VSP VAPOR SAMPLE PORT
 - ECU EMISSION CONTROL UNIT
 - LGAC LIQUID PHASE GRANULAR ACTIVATED CARBON

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OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

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





Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound

TVOCs = Total VOCs removed

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.

1. A notable increase in VOC mass removal was observed between Q3 2021 and Q1 2022 due to the increase in TVOCs detected (Figures 6A)

lbs = pounds

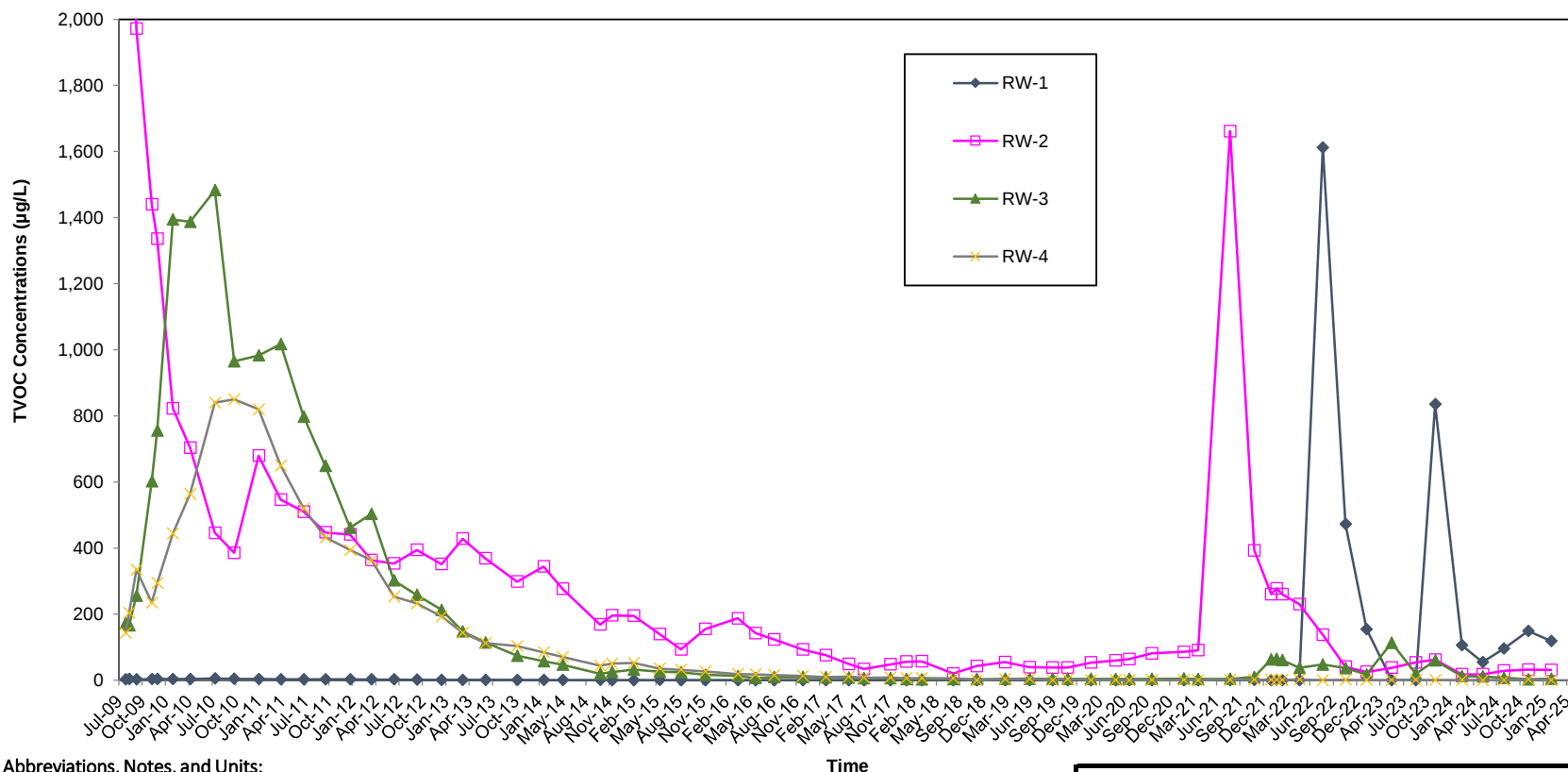
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT VOC MASS REMOVED

 ARCADIS

FIGURE

5



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected

1. Results prior to July 2009 are not shown to improve figure clarity. The TVOC concentrations were greater than 2,000 µg/L. See previous reports for full data set.
2. A notable increase in TVOCs was detected in the August 13, 2021, sample from RW-2. This increase is likely due to the ISTR system activities on the Bethpage Community Park property
3. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells. A notable increase in TVOCs was detected in the August 22, 2022 sample from RW-1, which is likely due to the addition of BCPMW-4-1 and BCPMW-4-2.
4. A notable increase in VOCs was detected in the November 07, 2023, RW-1 sample. At the time the sample was collected, the replacement of pumps and cleaning of the lines of recovery wells 4-1 and 4-2 (completed on November 6, 2023) likely contributed to the high project VOCs concentration reported.

µg/L = micrograms per liter

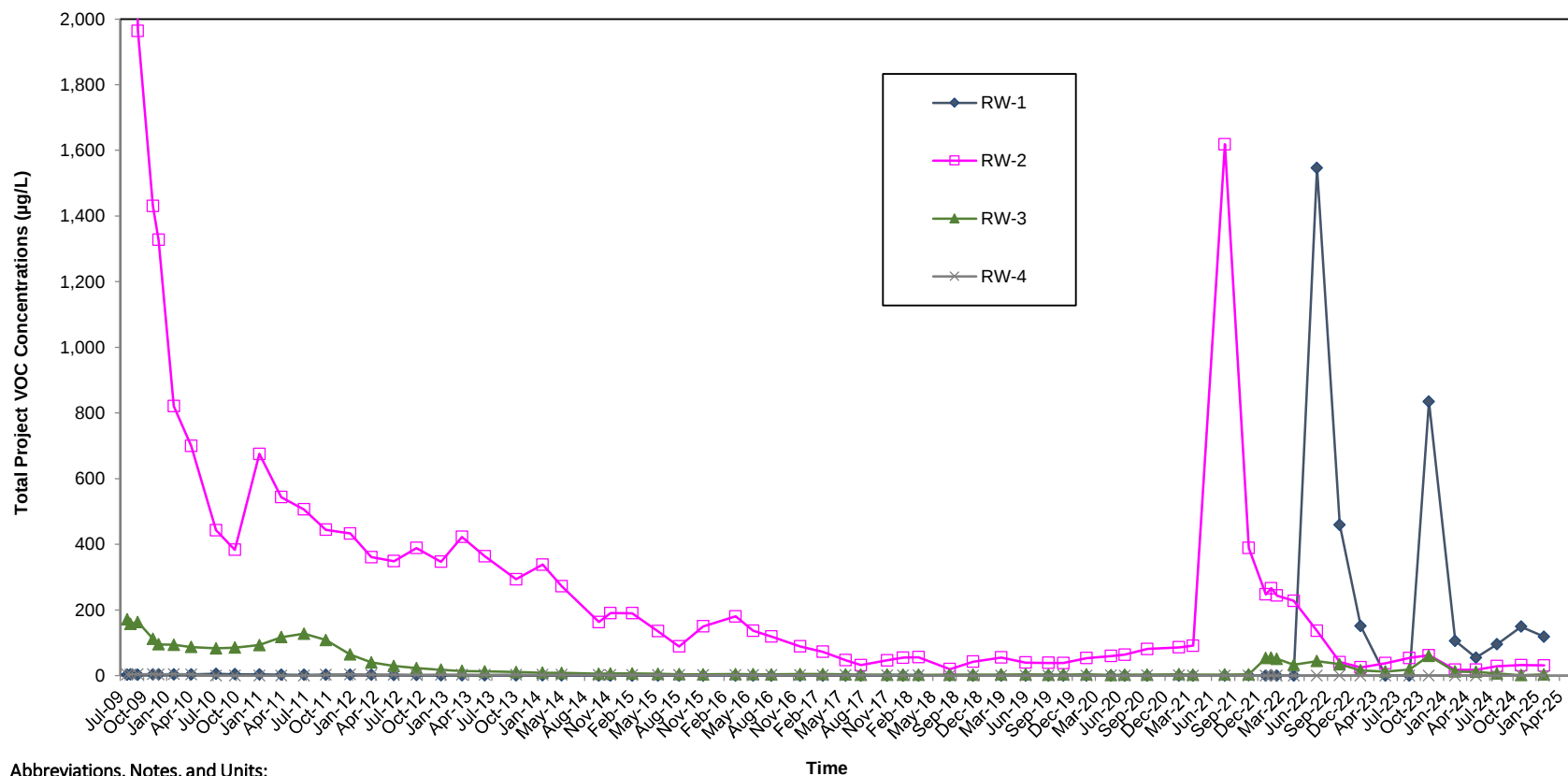
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
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BETHPAGE, NEW YORK

REMEDIAL WELL TOTAL VOC CONCENTRATIONS



FIGURE

6A



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.

1. Results prior to July 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.
2. A notable increase in Project VOCs was detected in the August 13, 2021, sample from RW-2. This increase is likely due to the ISTR system activities on the Bethpage Community Park property
3. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells. A notable increase in TVOCs was detected in the August 22, 2022 sample from RW-1, which is likely due to the addition of BCPMW-4-1 and BCPMW-4-2.
4. A notable increase in VOCs was detected in the November 07, 2023, RW-1 sample. At the time the sample was collected, the replacement of pumps and cleaning of the lines of recovery wells 4-1 and 4-2 (completed on November 6, 2023) likely contributed to the high project VOCs concentration reported.

µg/L = micrograms per liter

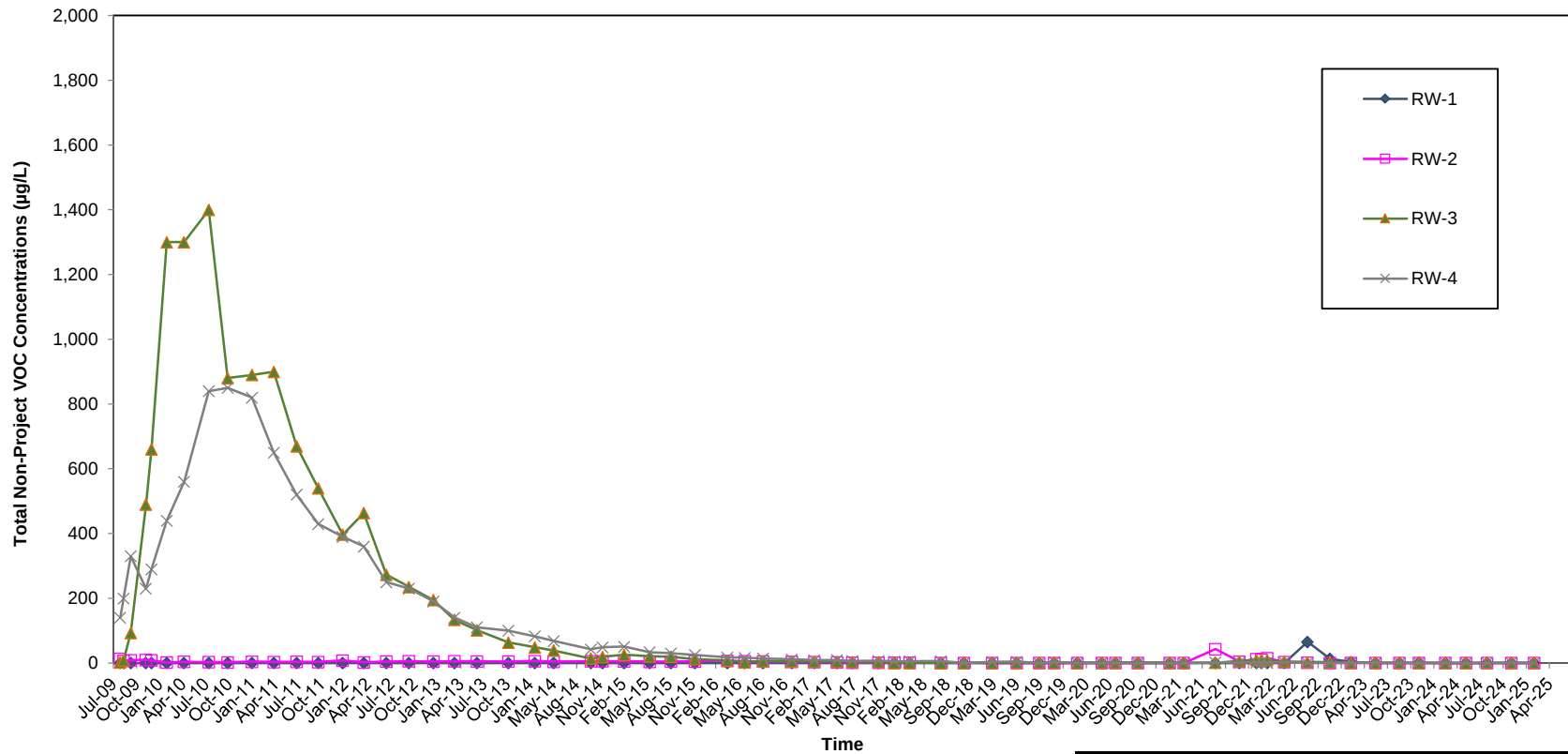
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BETHPAGE, NEW YORK

**REMEDIAL WELL PROJECT VOC
CONCENTRATIONS**

 **ARCADIS**

FIGURE

6B



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs detected.

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

1. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells.

µg/L = micrograms per liter

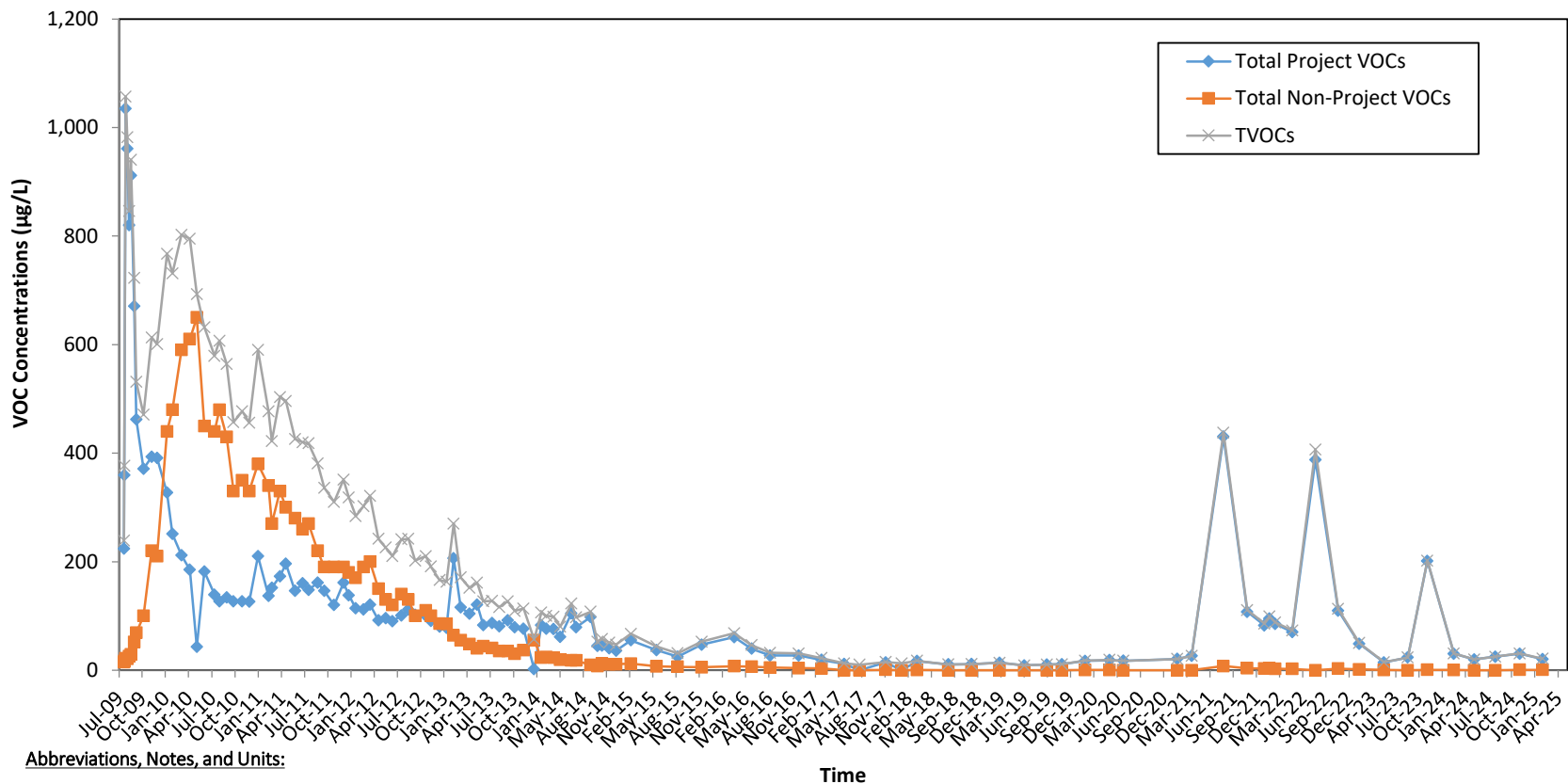
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BETHPAGE, NEW YORK

REMEDIAL WELL NON-PROJECT VOC CONCENTRATIONS



FIGURE

6C



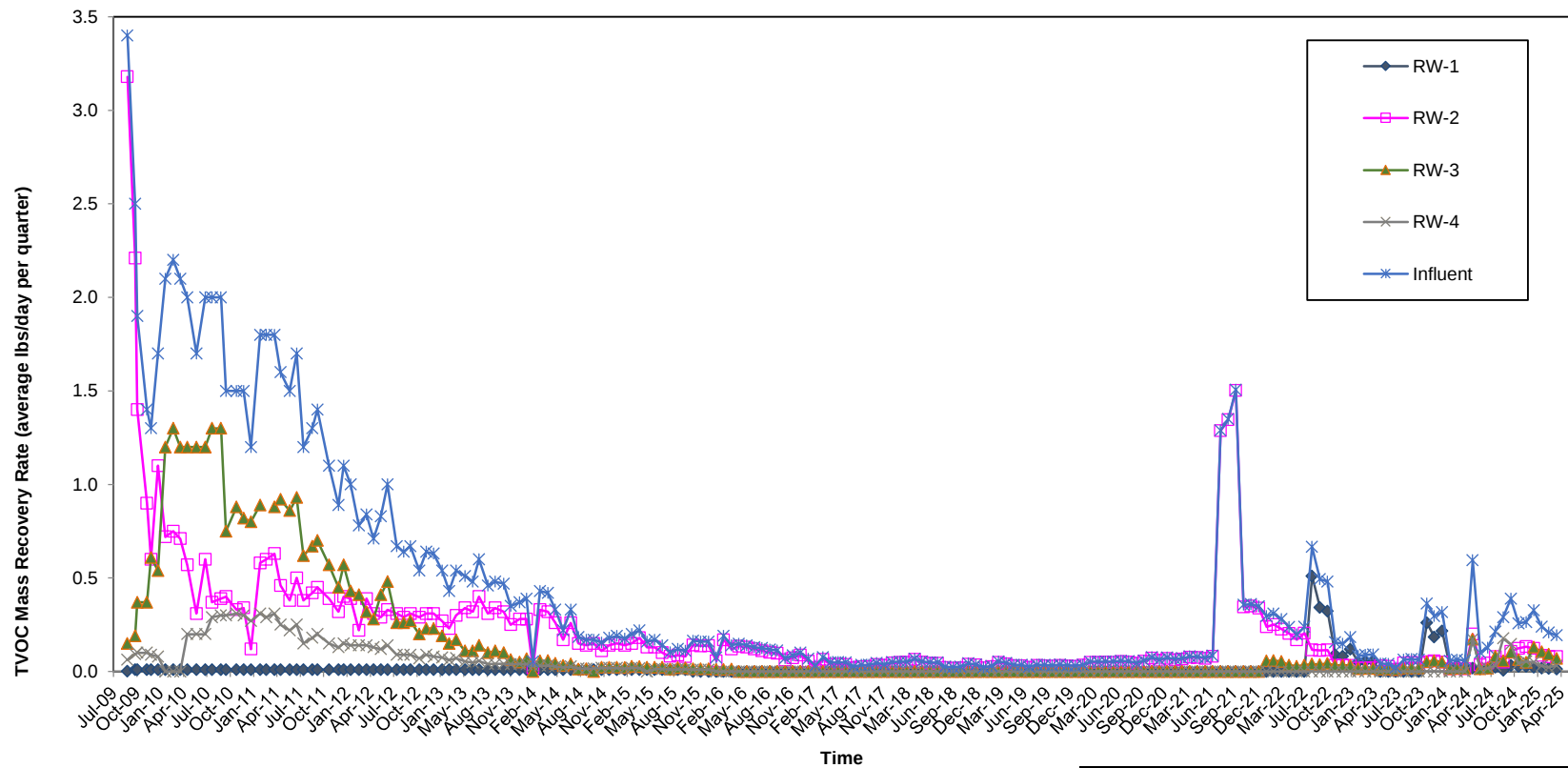
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 BETHPAGE, NEW YORK

INFLUENT TOTAL, PROJECT AND NON-PROJECT VOC CONCENTRATIONS



FIGURE

7



Abbreviation, Notes, and Units:

VOC = Volatile Organic Compound
TVOCs = Total VOCs

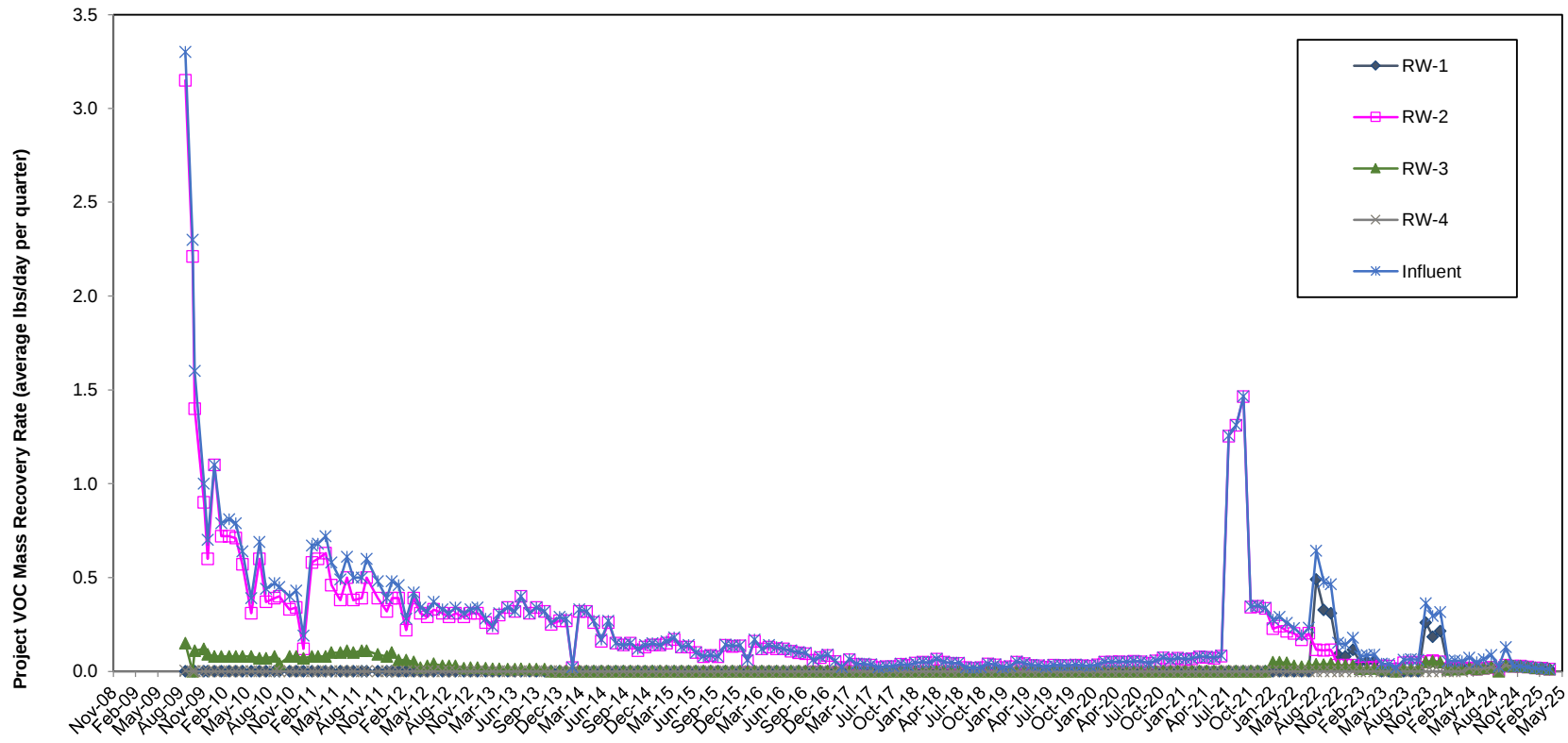
1. A notable increase in TVOC mass recovery rates was observed between Q3 2021 and Q1 2022, and Q3 2023 and Q4 2023 due to the increase in TVOCs detected (Figure 6A)
2. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells. A notable increase in TVOCs was detected in the August 22, 2022 sample from RW-1, which is likely due to the addition of BCPMW-4-1 and BCPMW-4-2.

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TOTAL VOC MASS RECOVERY RATES



FIGURE
8A



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound

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

1. A notable increase in TVOC mass recovery rates was observed between Q3 2021 and Q1 2022, and Q3 2023 and Q4 2023 due to the increase in TVOCs detected (Figure 6B)
2. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells. A notable increase in TVOCs was detected in the August 22, 2022 sample from RW-1, which is likely due to the addition of BCPMW-4-1 and BCPMW-4-2.

lbs/day = pounds per day

Time

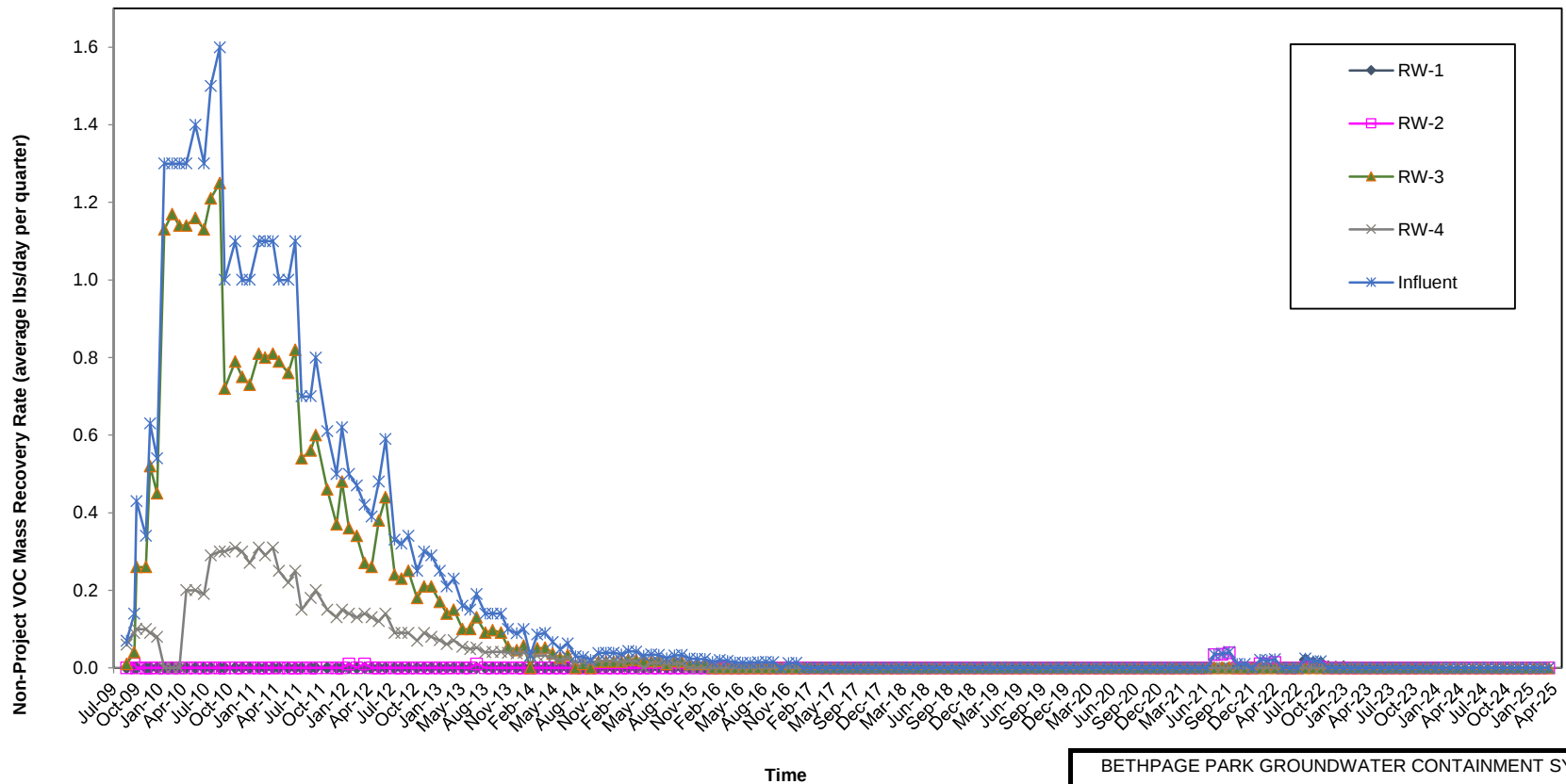
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PROJECT VOC MASS RECOVERY RATES



FIGURE

8B



Abbreviations, Notes, and Units:

VOC = Volatile Organic Compound

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

1. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells.

lbs/day = pounds per day

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NON-PROJECT VOC MASS RECOVERY RATES



FIGURE

8C