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Date: November 30, 2023

Our Ref: 30188750

Subject: Results of Third Quarter 2023 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 Third Quarter 2023 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 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.

The notable total and project VOC concentrations detected between Q3 2021 and Q3 2022 in RW-2, RW-1 (Figures 6A and 6B), and system influent water samples (Figure 7) have decreased significantly by Q3 2023. VOCs have not been detected in the BPGWCS Q3 2023 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. We will continue monitoring this situation during subsequent quarterly monitoring rounds.

Mr. Jason Pelton
NYSDEC RB

November 30, 2023

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

Sincerely,
Arcadis of New York, Inc.



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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



| 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 |
| 2021 Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 346 |
| 2022 Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 344 |
| 1Q 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 84 |
| 2Q 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 78 |
| July 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 29 |
| August 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 31 |
| September 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 28 |
| 3Q 2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 88 |
| 2023 Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 250 |
| TOTAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4960 |

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:

3Q Third Quarter 2023

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) | 11/16/22 | 02/08/23 | 05/18/23 | 08/22/23 |
|---|---------------|---------------|---------------|---------------|
| <u>Project VOCs</u> | | | | |
| 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 | 49.1 | 24.9 | 6.0 | 10.6 |
| Vinyl Chloride | 4.5 | 1.4 | < 1.0 | 0.69 J |
| cis 1,2-Dichloroethene | 49.1 | 22.3 | 8.4 | 12.1 |
| trans 1,2-Dichloroethene | 0.78 J | < 1.0 | < 1.0 | < 1.0 |
| Benzene | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Toluene | 3.3 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | 1.5 | < 1.0 | < 1.0 | < 1.0 |
| m,p-Xylene | 1.6 | < 1.0 | < 1.0 | < 1.0 |
| Subtotal Project VOCs | 109.9 | 48.6 | 14.4 | 23.4 |
| <u>Non-Project VOCs</u> | | | | |
| 1,1,1,2-Tetrachloroethane | <1.0 | < 1.0 | < 1.0 | < 1.0 |
| 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 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 2-Butanone | < 10 | < 10 | < 10 | < 10 |
| 4-Methyl-2-Pentanone | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Acetone | < 10 | < 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) | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Chloroethane | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroform | 1.2 | 0.72 J | 0.57 J | < 1.0 |
| 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) | 11/16/22 | 02/08/23 | 05/18/23 | 08/22/23 |
|---|------------|---------------|-------------|-------------|
| Non-Project VOCs | | | | |
| Dichlorodifluoromethane (Freon 12) | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Dichloromethane | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Ethylbenzene | 1.7 | 0.76 J | < 1.0 | < 1.0 |
| Methyl N-Butyl Ketone | < 5.0 | < 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) | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Trichlorotrifluoroethane (Freon 113) | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Subtotal Non-Project VOCs | 2.9 | 1.5 | 0.57 | ND |
| Total VOCs^{1,4} | 113 | 50 | 15 | 23 |
| 1,4-Dioxane | 2.0 | 1.6 | 0.30 | 0.58 |
| pH ² | 5.1 | 6.2 | 5.7 | 5.8 |

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

12.1 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 | 10/13/22 | 11/16/22 | 12/12/22 | 01/10/23 | 02/08/23 | 03/07/23 | 04/11/23 | 05/18/23 | 06/23/23 | 07/14/23 | 08/22/23 | 09/07/23 |
|---|------------------------------|--------------|--------------|--------------|-------------|--------------|--------------|----------------------------|--------------|--------------|--------------|--------------|--------------|
| 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 | 10/13/22 | 11/16/22 | 12/12/22 | 01/10/23 | 02/08/23 | 03/07/23 | 04/11/23 | 05/18/23 | 06/23/23 | 07/14/23 | 08/22/23 | 09/07/23 |
| Non-Project VOCs | | | | | | | | | | | | | |
| Acetone | 50 | < 10 | <10 | <10 | < 10 | <10 | <10 | < 10 | <10 | < 10 | < 10 | < 10 | < 10 |
| Chloroform | 5 ² | < 1.1 | <1.1 | <1.0 | < 1.1 | <1.1 | <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 | < 5.1 | <5.1 | <5.0 | < 5.1 | <5.1 | <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 | 10/13/22 | 11/16/22 | 12/12/22 | 01/10/23 | 02/08/23 | 03/07/23 | 04/11/23 | 05/18/23 | 06/23/23 | 07/14/23 | 08/22/23 | 09/07/23 |
| Inorganics | | | | | | | | | | | | | |
| Total Iron | 600 | 281 | 214 | 186 | 178 | 142 | 519 | <100 | 249 | 149 | <100 | 142 | <100 |
| Total Manganese | 600 | 82.0 | 67.3 | 70.6 | 63.0 | 54.0 | 49.5 | 37.4 | 36.5 | 36.6 | 37.7 | 35.1 | 37.2 |
| Nitrate and Nitrite | 10,000 | 2,700 | 3,200 | 2,800 | <100 | 2,600 | 2,300 | 164,000⁸ | 2,200 | 2,200 | 2,100 | 2,200 | 2,100 |
| Total Kjeldahl Nitrogen | 10,000 | <200 | <200 | <200 | <200 | 430 | <200 | < 200 | < 100 | < 100 | < 100 | < 100 | <100 |
| Total Nitrogen | 10,000 | 2,700 | 3,500 | 3,000 | <300 | 3,000 | 2,300 | 164,000⁸ | 2,200 | 2,200 | 2,100 | 2,200 | 2,100 |
| 1,4-Dioxane | NE | 1.4 | 1.2 | 0.90 | 0.92 | 1.0 | 0.61 | 0.29 | 0.33 | 0.39 | 0.80 | 0.70 | 0.75 |
| Compound ⁶ (All Constituent Concentrations in µg/L) | Discharge Limit ¹ | 10/13/22 | 11/16/22 | 12/12/22 | 01/10/23 | 02/08/23 | 03/07/23 | 04/11/23 | 05/18/23 | 06/23/23 | 07/14/23 | 08/22/23 | 09/07/23 |
| PCBs | | | | | | | | | | | | | |
| Aroclor 1016 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Aroclor 1221 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Aroclor 1232 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Aroclor 1242 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | 0.076 | 0.13 |
| Aroclor 1248 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Aroclor 1254 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Aroclor 1260 | 0.095 | -- | -- | -- | -- | -- | -- | -- | -- | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| pH ⁵ | 5.5-8.5 | 5.9 | 6.2 | 7.0 | 6.0 | 6.2 | 6.6 | 7.0 | 6.2 | 8.5 | 7.2 | 7.1 | 8.4 |

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
8. Elevated readings are likely due to problems with lab results and therefore do not reflect actual discharge values

| | |
|-------------|--|
| SPDES | State Pollutant Discharge Elimination System |
| VOC | Volatile Organic Compound |
| NE | Not Established |
| -- | pH not recorded due to a field recording error. |
| 37.2 | 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. |

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 ^{1,3} (All Constituent Concentrations in µg/m ³) | 02/08/23 | 08/22/23 |
|---|--------------|------------------|
| <u>Project VOCs</u> | | |
| 1,1,1 - Trichloroethane | < 2.2 | < 1.1 |
| 1,1 - Dichloroethane | 3.0 J | 2.5 |
| 1,2 - Dichloroethane | < 3.2 | < 1.6 |
| 1,1 - Dichloroethene | 1.8 | 1.6 |
| Tetrachloroethene | 2.5 | 2.9 |
| Trichloroethene | 276 | 286 |
| Vinyl Chloride | 19 | 15 |
| cis 1,2-Dichloroethene | 288 | 316 |
| trans 1,2-Dichloroethene | 2.9 J | 3.2 |
| Benzene | 3.5 | 1.9 |
| Toluene | 1.6 J | 0.98 J |
| o-Xylene | 2.1 J | 1.3 J |
| m,p-Xylene | 2.5 J | 1.4 J |
| Subtotal Project VOCs | 603 | 633 |
| <u>Non-Project VOCs</u> | | |
| 1,1,2,2-Tetrachloroethane | < 2.7 | < 1.4 |
| 1,1,2-Trichloroethane | < 2.2 | < 1.1 |
| 1,2-Dichloropropane | < 3.7 | < 1.8 |
| 1,3-Butadiene | < 1.8 | < 0.88 |
| 2-Butanone | 2.7 | 0.88 J |
| 4-Methyl-2-Pentanone | < 3.3 | < 1.6 |
| Acetone | 21 | 7.1 |
| Bromodichloromethane | < 2.7 | < 1.3 |
| Bromoform | < 1.7 | < 0.83 |
| Bromomethane | < 3.1 | < 1.6 |
| Carbon Disulfide | < 2.5 | < 1.2 |
| Carbon Tetrachloride | < 1.0 | < 0.50 |
| Chlorobenzene | < 3.7 | < 1.8 |
| Chlorodibromomethane | < 3.4 | < 1.7 |
| Chlorodifluoromethane (Freon 22) | 2.9 | 3.4 |
| Chloroethane | < 2.1 | < 1.1 |
| Chloroform | 12 | 13 |
| Chloromethane | 2.5 | < 0.83 |
| cis-1,3-Dichloropropene | < 3.6 | < 1.8 |
| Dichlorodifluoromethane (Freon 12) | 2.1 J | 1.7 J |
| Dichloromethane | 3.5 | < 1.4 |
| Ethylbenzene | 7.4 | < 1.7 |
| Methyl N-Butyl Ketone | < 3.3 | < 1.6 |
| Methyl Tert-Butyl Ether | < 2.9 | < 1.4 |
| Styrene (Monomer) | < 3.4 | < 1.7 |
| trans-1,3-Dichloropropene | < 3.6 | < 1.8 |
| Trichlorofluoromethane (Freon 11) | < 2.2 | < 1.1 |
| Trichlorotrifluoroethane (Freon 113) | < 3.1 | 1.6 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | < 3.3 | < 1.6 |
| Subtotal Non-Project VOCs | 54 | 28 |
| Total VOCs^{2,4,5,6} | 657 | 660 |

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.

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.

5. Influent vapor samples were not analyzed for the Q4 2022 reporting period due to a laboratory error. Influent vapor sample results from the Q1 2023 event were in line with historic concentrations.

6. Influent vapor samples were not analyzed for the Q2 2023 reporting period due to a sampling error.

| | |
|--------|---|
| 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 |

| | |
|------------|--|
| 6.5 | Bold value indicates a detection. |
| < 3.4 | Compound not detected above the laboratory quantification limit. |
| J | Result is estimated. |

µg/m³ 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} (All Constituent Concentrations in µg/m ³) | Discharge Limit ⁽²⁾ (µg/m ³) | 02/08/23 | 05/18/23 | 08/22/23 |
|---|---|---------------|-------------|---------------|
| Project VOCs | | | | |
| 1,1,1 - Trichloroethane | 9,000 | < 0.44 | < 2.2 | < 0.44 |
| 1,1 - Dichloroethane | NS | 1.9 | < 3.2 | 1.6 |
| 1,2 - Dichloroethane | 1,000 ⁽⁴⁾ | < 0.65 | < 3.2 | < 0.65 |
| 1,1 - Dichloroethene | 19,800 ⁽⁴⁾ | 1.2 | < 0.63 | 0.91 |
| Tetrachloroethene | 300 | 0.68 | < 1.1 | 5.4 |
| Trichloroethene | 14,000 | 26 | 9.1 | 24 |
| Vinyl Chloride | 180,000 | 10 | 3.8 | 4.9 |
| cis 1,2-Dichloroethene | 190,000 ⁽⁴⁾ | 99.5 | 79.7 | 99.1 |
| trans 1,2-Dichloroethene | 190,000 | 0.63 | < 3.2 | 0.67 |
| Benzene | 1,300 | 0.38 J | < 2.6 | 1.7 |
| Toluene | 37,000 | 0.79 | < 3.0 | 34 |
| o-Xylene | 4,300 | 0.61 J | < 3.5 | 1.4 |
| m,p-Xylene | 4,300 | 0.78 | < 3.5 | 5.6 |
| Subtotal Project VOCs | NA | 142 | 93 | 179 |
| Non-Project VOCs | | | | |
| 1,1,2,2-Tetrachloroethane | 2,000 ⁽⁴⁾ | < 0.55 | < 2.7 | < 0.55 |
| 1,1,2-Trichloroethane | 11,000 ⁽⁴⁾ | < 0.44 | < 2.2 | < 0.44 |
| 1,2-Dichloropropane | 83,000 ⁽⁴⁾ | < 0.74 | < 3.7 | < 0.74 |
| 1,3-Butadiene | | < 0.35 | < 1.8 | < 0.35 |
| 2-Butanone | 13,000 | 2.3 | < 2.4 | 9.7 |
| 4-Methyl-2-Pentanone | 31,000 | < 0.66 | < 3.3 | 0.94 |
| Acetone | 180,000 | 14 | 39.4 | 18 |
| Bromodichloromethane | NS | < 0.54 | < 2.7 | < 0.54 |
| Bromoform | 1,000 ⁽⁴⁾ | < 0.33 | < 1.7 | < 0.33 |
| Bromomethane | 3,900 ⁽⁴⁾ | < 0.62 | < 3.1 | < 0.62 |
| Carbon Disulfide | 6,200 | < 0.50 | < 2.5 | 0.27 J |
| Carbon Tetrachloride | 1,900 | < 0.20 | < 1.0 | < 0.20 |
| Chlorobenzene | 83,000 ⁽⁴⁾ | < 0.74 | < 3.7 | < 0.74 |
| Chlorodibromomethane | NS | < 0.68 | < 3.4 | < 0.68 |
| Chlorodifluoromethane (Freon 22) | NS | 3.9 | < 2.8 | 3.2 |
| Chloroethane | NS | < 0.42 | < 2.1 | < 0.42 |
| Chloroform | 150 | 6.8 | 5.9 | 7.3 |
| Chloromethane | 22,000 | 1.7 | < 1.7 | 1.1 |
| cis-1,3-Dichloropropene | NS | < 0.73 | < 3.6 | < 0.73 |
| Dichlorodifluoromethane (Freon 12) | NS | 2.2 | < 4.0 | 1.3 |
| Dichloromethane | 14,000 | 0.97 | 3.0 | 0.73 |
| Ethylbenzene | 100,000 ⁽⁴⁾ | 1.1 | < 3.5 | 2.6 |
| Methyl N-Butyl Ketone | 4,000 | < 0.65 | < 3.3 | < 0.65 |
| Methyl Tert-Butyl Ether | 43,000 ⁽⁴⁾ | < 0.58 | < 2.9 | < 0.58 |
| Styrene (Monomer) | 17,000 | < 0.68 | < 3.4 | < 0.68 |
| trans-1,3-Dichloropropene | NS | < 0.73 | < 3.6 | < 0.73 |
| Trichlorofluoromethane (Freon 11) | 9,000 | 1.1 | < 2.2 | 1.0 |
| Trichlorotrifluoroethane (Freon 113) | 960,000 | < 0.61 | < 3.1 | < 0.61 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | | 0.45 J | < 3.3 | < 0.66 |
| Subtotal Non-Project VOCs | NA | 35 | 48 | 53 |
| Total VOCs^{2,4,5} | NA | 177 | 141 | 233 |

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.
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.
5. Effluent vapor samples were not analyzed for the Q4 2022 reporting period due to a laboratory recording error.

| | |
|--------|---|
| 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 |

| | |
|-------------------|--|
| 1.6 | Bold value indicates a detection. |
| < 0.65 | 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 ^{1,4} (All Constituent Concentrations in ppbv) | 02/08/23 | 05/18/23 | 08/22/23 |
|---|----------------|----------|----------|
| <u>Tentatively Identified Compounds</u> | | | |
| Carbon Dioxide | 150 JNB | ND | ND |
| 1-Hexanol, 2-ethyl | 5.2 JN | ND | ND |
| Acetic acid, 2-ethylhexyl ester | 1.4 JN | ND | ND |
| Ethyl Acetate | ND | ND | ND |
| Cyclohexane, methyl- | 1.6 JN | ND | ND |
| Total VOC TICs^{2,3,5,6} | 24.53 J | 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 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. VSP-5 sample location moved to new sample port at ECU effluent stack.

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

4. 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.

5. 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.

6. Effluent vapor samples were not analyzed for the Q4 2022 reporting period due to a laboratory recording error.

| | |
|--------|---|
| 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 |

| | |
|------------|--|
| 150 | 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



| Date ^{1,8} | 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. (°R) ⁵ | |
|---------------------|--|-------|-------|-------|-----------------------------------|-----------------------|---|-------|-------|-------|-----------------------|--------------------------------------|--|---------|---------|---------|--------------------------------|----------|
| | Remedial Well ² | | | | Combined Influent ³ | Effluent ² | Remedial Well Effluent ^{2,4} | | | | Effluent ⁵ | Effluent | ECU Influent | | | | Effluent | Effluent |
| | RW-1 ⁷ | 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) | (gpm) | (gpm) | (psi) | (psi) | (psi) | (psi) | (psi) | (scfm) | (iwc) | (iwc) | (iwc) | (iwc) | (iwc) | (°R) |
| 10/13/22 | 15.9 | 65.6 | 74.8 | 29.9 | 186 | 178 | 22 | 8 | 43 | 55 | 10 | 1,125 | 3.5 | < 1.0 | < 1.0 | < 1.0 | 0.5 | 538 |
| 11/16/22 | 14.5 | 66.2 | 73.1 | 29.9 | 184 | 175 | 23 | 8 | 47 | 56 | 11 | 1,109 | 3.5 | < 1.0 | < 1.0 | < 1.0 | 6.5 | 528 |
| 12/12/22 | 14.1 | 66.1 | 75.0 | 30.0 | 185 | 189 | 22 | 8 | 41 | 56 | 20 | 1,173 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 536 |
| 01/10/23 | 30.6 | 65.4 | 75.1 | 30.4 | 201 | 216 | 71 | 9 | 41 | 55 | 9 | 1,202 | 3.0 | < 1.0 | < 1.0 | < 1.0 | 4.5 | 523 |
| 02/08/23 | 28.5 | 65.9 | 74.4 | 30.6 | 199 | 212 | 71 | 9 | 44 | 55 | 24 | 1,220 | 3.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 528 |
| 03/07/23 | 30.9 | 65.4 | 75.8 | 30.8 | 203 | 216 | 59 | 9 | 39 | 55 | 13 | 1,157 | 3.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 522 |
| 04/11/23 | 28.8 | 64.7 | 75.2 | 30.1 | 199 | 207 | 58 | 9 | 42 | 56 | 12 | 1,131 | 3.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 534 |
| 05/18/23 | 30.3 | 64.5 | 75.2 | 30.1 | 200 | 212 | 58 | 9 | 44 | 56 | 17 | 1,260 | 4.0 | < 1.0 | < 1.0 | < 1.0 | 2.5 | 540 |
| 07/14/23 | 29.5 | 73.9 | 75.1 | 29.7 | 208 | 216 | 59 | 27 | 39 | 55 | 14 | 1,130 | 3.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 546 |
| 08/22/23 | 30.3 | 73.9 | 78.1 | 31.0 | 213 | 219 | 57 | 27 | 35 | 54 | 16 | 1,128 | 2.5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 546 |
| 09/07/23 | 30.9 | 73.6 | 76.0 | 31.0 | 212 | 221 | 57 | 26 | 40 | 54 | 22 | 1,103 | 2.5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 553 |

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.
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.

| | |
|-------|--|
| 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 |

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; trichloroethylene; 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. 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.

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

Table 9
 2023 Rule 212 Evaluation
 Bethpage Park Soil Gas Containment System and Groundwater Containment System
 Operable Unit 3 (Former Grumman Settling Ponds)
 Northrop Grumman,
 Bethpage, New York



| Project VOCs | CAS# | HTAC? ¹ | 2023 BPGWCS Maximum Effluent Conc. (ug/m3) ^{2,8} | 2023 BPSGCS Maximum Effluent Conc. (ug/m3) ^{2,8} | 2023 BPGWCS Emissions (lb/yr) ⁴ | 2023 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 | | 2.1 | 0.000 | 0.016 | 0.115 | 100 | N |
| 1,1 - Dichloroethane | 75-34-3 | No | 1.9 | 4.9 | 0.076 | 0.085 | 0.392 | 100 | N |
| 1,1 - Dichloroethene | 75-35-4 | No | 1.2 | 1.1 | 0.048 | 0.026 | 0.125 | 100 | N |
| Benzene | 71-43-2 | Yes | 0.38 | 0.54 | 0.015 | 0.009 | 0.050 | 100 | N |
| cis- 1,2-Dichloroethene | 156-59-2 | No | 99.5 | 142 | 3.975 | 3.932 | 14.594 | 100 | N |
| Tetrachloroethene | 127-18-4 | Yes | 0.68 | 5.6 | 0.027 | 0.011 | 0.301 | 1000 | N |
| Toluene | 108-88-3 | No | 0.79 | 2.9 | 0.032 | 0.015 | 0.184 | 100 | N |
| trans- 1,2-Dichloroethene | 156-60-5 | No | 0.63 | 3.0 | 0.025 | 0.134 | 0.300 | 100 | N |
| Trichloroethene | 79-01-6 | Yes | 26 | 274 | 1.039 | 0.009 | 13.952 | 500 | N |
| Vinyl Chloride | 75-01-4 | Yes | 10 | 1.1 | 0.399 | 0.176 | 0.627 | 100 | N |
| Xylenes ³ | 1330-20-7 | No | 1.39 | 1.11 | 0.056 | 0.040 | 0.148 | 100 | N |
| Non-Project VOCs | | | | | | | | | |
| 1-Chloro-1,1-difluoroethane (Freon 142B) | 75-68-3 | No | 0.45 | 90.8 | 0.018 | 0.000 | 4.294 | 100 | N |
| 2-Butanone | 78-93-3 | No | 2.3 | 3.2 | 0.092 | 0.049 | 0.291 | 100 | N |
| 2-Hexanone | 591-78-6 | No | | 0.78 | 0.000 | 0.000 | 0.037 | 100 | N |
| Acetone | 67-64-1 | No | 39.4 | 5.0 | 1.574 | 0.306 | 2.115 | 100 | N |
| Chlorodifluoromethane (Freon 22) | 75-45-6 | No | 3.9 | 0.88 | 0.156 | 0.000 | 0.197 | 100 | N |
| Chloromethane | 74-87-3 | No | 1.7 | 0.56 | 0.068 | 0.013 | 0.107 | 100 | N |
| Chloroform | 67-66-3 | Yes | 6.8 | 26 | 0.272 | 0.291 | 1.787 | 100 | N |
| Dichlorodifluoromethane (Freon 12) | 75-71-8 | No | 2.2 | 2.2 | 0.088 | 0.018 | 0.210 | 100 | N |
| Ethylbenzene | 100-41-4 | No | 1.1 | | 0.044 | 0.011 | 0.055 | 100 | N |
| Methylene Chloride | 75-09-2 | No | 3.0 | 5.6 | 0.120 | 0.023 | 0.406 | 100 | N |
| Styrene (Monomer) | 100-42-5 | No | | 2.0 | 0.000 | 0.000 | 0.094 | 100 | N |

Footnotes on last page

Table 9
 2023 Rule 212 Evaluation
 Bethpage Park Soil Gas Containment System and Groundwater Containment System
 Operable Unit 3 (Former Grumman Settling Ponds)
 Northrop Grumman,
 Bethpage, New York



| Project VOCs | CAS# | HTAC? ¹ | 2023 BPGWCS Maximum Effluent Conc. (ug/m3) ^{2,8} | 2023 BPSGCS Maximum Effluent Conc. (ug/m3) ^{2,8} | 2023 BPGWCS Emissions (lb/yr) ⁴ | 2023 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 |
|-----------------------------------|---------|--------------------|---|---|--|---|--|--|---|
| Non-Project VOCs (cont'd) | | | | | | | | | |
| Trichlorofluoromethane (Freon 11) | 75-69-4 | No | 1.1 | 1.5 | 0.044 | 0.015 | 0.130 | 100 | N |

Flowrates

| Description | Flow (cfm) |
|-----------------------------|------------|
| BPGWCS | 1220 |
| BPSGCS - combined with ISTR | 740 |

Notes:

- High toxicity air contaminant (HTAC) based on 6 CRR-NY Rule 212-2.2, Table 2 – high toxicity air contaminant list.
- Maximum effluent concentrations for soil gas effluent from VSP-601 and GW vapor from VSP-05 based on sampling performed in 2023. Compounds not detected above the laboratory reporting limit are excluded from the air quality impact analysis summary.
- Total for xylenes m, o, and P.
- 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., TCE (lb/yr) = TCE [µg/m³] x Air Flow Rate [ft³/min] x (1 m³/35.3147 ft³) x (60 min/hr) x (0.000001 g/1 µg) x (0.0022 lb/g) x 8,760 hrs/yr
- Combined 2022 emissions from groundwater, ISTR, and soil gas containment systems.
- 100 lb/yr for non-HTACs, and mass emission limits based on Rule 212-2.2, Table 2 for HTACs.
- 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.
- 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



| Compound ¹ (All Constituent Concentrations in µg/L) | Sample Location: Sample Date: NYSDEC SCGs | RW-1 11/16/2022 | RW-1 2/8/2023 | RW-1 5/18/2023 | RW-1 8/22/2023 |
|---|---|--------------------|------------------|-------------------|-------------------|
| Project VOCs | | | | | |
| 1,1,1-Trichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | 5 | 2.1 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | 0.6 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | 5 | 1.5 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | 5 | 0.60 J | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethylene | 5 | 192 | 82.5 | < 1.0 | < 1.0 |
| Vinyl Chloride | 2 | 27 | 4.3 | < 1.0 | < 1.0 |
| cis-1,2-dichloroethene | 5 | 188 | 63.1 | < 1.0 | < 1.0 |
| trans-1,2-dichloroethene | 5 | 3.8 | 1.1 | < 1.0 | < 1.0 |
| Benzene | 1 | 1.6 | < 0.50 | < 0.50 | < 0.50 |
| Toluene | 5 | 21.2 | < 1.0 | < 1.0 | < 1.0 |
| Xylene-o | 5 | 11.4 | < 1.0 | < 1.0 | < 1.0 |
| Xylenes-m,p | 5 | 11.8 | < 1.0 | < 1.0 | < 1.0 |
| Subtotal Project VOCs | | 461.1 | 151.0 | ND | ND |
| Non-Project VOCs | | | | | |
| 1,1,2,2-Tetrachloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Butadiene | 0.5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 2-Butanone | NE | < 10 | < 10 | < 10 | < 10 |
| 4-methyl-2-pentanone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Acetone | NE | < 10 | < 10 | < 10 | < 10 |
| Bromodichloromethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromoform | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon Disulfide | 60 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon tetrachloride | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodibromomethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodifluoromethane (Freon 22) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Chloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroform | 7 | 0.53 J | < 1.0 | < 1.0 | < 1.0 |
| Chloromethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| cis-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dichlorodifluoromethane (Freon 12) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Dichloromethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Ethylbenzene | 5 | 12.7 | 3.5 | < 1.0 | < 1.0 |
| Methyl N-Butyl Ketone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Methyl tert-Butyl Ether | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| trans-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane (Freon 11) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Trichlorotrifluoroethane (Freon 113) | 5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Subtotal Non-Project VOCs | | 13.2 | 3.5 | ND | ND |
| Total VOCs^{2,3} | | 474 | 155 | ND | ND |
| 1,4-Dioxane | | 11.0 | 4.7 | 0.23 J | 0.5 |

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



| Compound ¹ (All Constituent Concentrations in µg/L) | Sample Location: Sample Date: NYSDEC SCGs | RW-2 11/16/2022 | RW-2 2/8/2023 | RW-2 5/18/2023 | RW-2 8/22/2023 |
|---|---|--------------------|------------------|-------------------|-------------------|
| Project VOCs | | | | | |
| 1,1,1-Trichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | 0.6 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethylene | 5 | 12.9 | 9.2 | 14.9 | 23.7 |
| Vinyl Chloride | 2 | 1.7 | 1.2 | 2 | 2.1 |
| cis-1,2-dichloroethene | 5 | 26.3 | 14.8 | 21.2 | 28.3 |
| trans-1,2-dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | 1 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Toluene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Xylene-o | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Xylenes-m,p | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Subtotal Project VOCs | | 40.9 | 25.2 | 38.1 | 54.1 |
| Non-Project VOCs | | | | | |
| 1,1,2,2-Tetrachloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Butadiene | 0.5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 2-Butanone | NE | < 10 | < 10 | < 10 | < 10 |
| 4-methyl-2-pentanone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Acetone | NE | < 10 | < 10 | < 10 | < 10 |
| Bromodichloromethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromoform | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon Disulfide | 60 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon tetrachloride | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodibromomethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodifluoromethane (Freon 22) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Chloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroform | 7 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloromethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| cis-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dichlorodifluoromethane (Freon 12) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Dichloromethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Ethylbenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl N-Butyl Ketone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Methyl tert-Butyl Ether | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| trans-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane (Freon 11) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Trichlorotrifluoroethane (Freon 113) | 5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Subtotal Non-Project VOCs | | ND | ND | ND | ND |
| Total VOCs^{2,3} | | 40.9 | 25.2 | 38.1 | 54.1 |
| 1,4-Dioxane | | 0.64 | 0.40 | 0.26 | 1.3 |

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



| Compound ¹ (All Constituent Concentrations in µg/L) | Sample Location: Sample Date: NYSDEC SCGs | RW-3 11/16/2022 | RW-3 2/8/2023 | RW-3 5/18/2023 | RW-3 8/22/2023 |
|---|---|--------------------|------------------|-------------------|-------------------|
| Project VOCs | | | | | |
| 1,1,1-Trichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | 0.6 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethylene | 5 | 10.0 | 4.7 | 5.0 | 9.1 |
| Vinyl Chloride | 2 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| cis-1,2-dichloroethene | 5 | 24.5 | 11.5 | 7.4 | 9.4 |
| trans-1,2-dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | 1 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Toluene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Xylene-o | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Xylenes-m,p | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Subtotal Project VOCs | | 35 | 16 | 12 | 19 |
| Non-Project VOCs | | | | | |
| 1,1,2,2-Tetrachloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Butadiene | 0.5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 2-Butanone | NE | < 10 | < 10 | < 10 | < 10 |
| 4-methyl-2-pentanone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Acetone | NE | < 10 | < 10 | < 10 | < 10 |
| Bromodichloromethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromoform | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon Disulfide | 60 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon tetrachloride | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodibromomethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodifluoromethane (Freon 22) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Chloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroform | 7 | 2.3 | 1.4 | 1.2 | < 1.0 |
| Chloromethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| cis-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dichlorodifluoromethane (Freon 12) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Dichloromethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Ethylbenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl N-Butyl Ketone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Methyl tert-Butyl Ether | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| trans-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane (Freon 11) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Trichlorotrifluoroethane (Freon 113) | 5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Subtotal Non-Project VOCs | | 2.3 | 1.4 | 1.2 | 0.9 |
| Total VOCs^{2,3} | | 36.8 | 17.6 | 13.6 | 19.4 |
| 1,4-Dioxane | | 1.1 | 0.78 | 0.39 | 1.3 |

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



| Compound ¹ (All Constituent Concentrations in µg/L) | Sample Location: Sample Date: NYSDEC SCGs | RW-4 11/16/2022 | RW-4 2/8/2023 | RW-4 5/18/2023 | RW-4 8/22/2023 |
|---|---|--------------------|------------------|-------------------|-------------------|
| Project VOCs | | | | | |
| 1,1,1-Trichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | 0.6 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethylene | 5 | 0.56 J | < 1.0 | < 1.0 | < 1.0 |
| Vinyl Chloride | 2 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| cis-1,2-dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| trans-1,2-dichloroethene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | 1 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Toluene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Xylene-o | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Xylenes-m,p | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Subtotal Project VOCs | | 0.56 | ND | ND | ND |
| Non-Project VOCs | | | | | |
| 1,1,2,2-Tetrachloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Butadiene | 0.5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 2-Butanone | NE | < 10 | < 10 | < 10 | < 10 |
| 4-methyl-2-pentanone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Acetone | NE | < 10 | < 10 | < 10 | < 10 |
| Bromodichloromethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromoform | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon Disulfide | 60 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Carbon tetrachloride | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodibromomethane | 50 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorodifluoromethane (Freon 22) | NE | 0.78 J | 0.70 J | 0.56 J | 0.52 J |
| Chloroethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroform | 7 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloromethane | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| cis-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dichlorodifluoromethane (Freon 12) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Dichloromethane | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Ethylbenzene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl N-Butyl Ketone | 50 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Methyl tert-Butyl Ether | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | 5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| trans-1,3-dichloropropene | 0.4 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane (Freon 11) | 5 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Trichlorotrifluoroethane (Freon 113) | 5 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| 1-Chloro-1,1-difluoroethane (Freon 142b) | NE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Subtotal Non-Project VOCs | | 0.78 | 0.70 | 0.56 | 0.52 |
| Total VOCs^{2,3} | | 1.3 | 0.70 | 0.56 | 0.52 |
| 1,4-Dioxane | | 0.12 | 0.13 J | 0.10 J | 0.13 J |

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

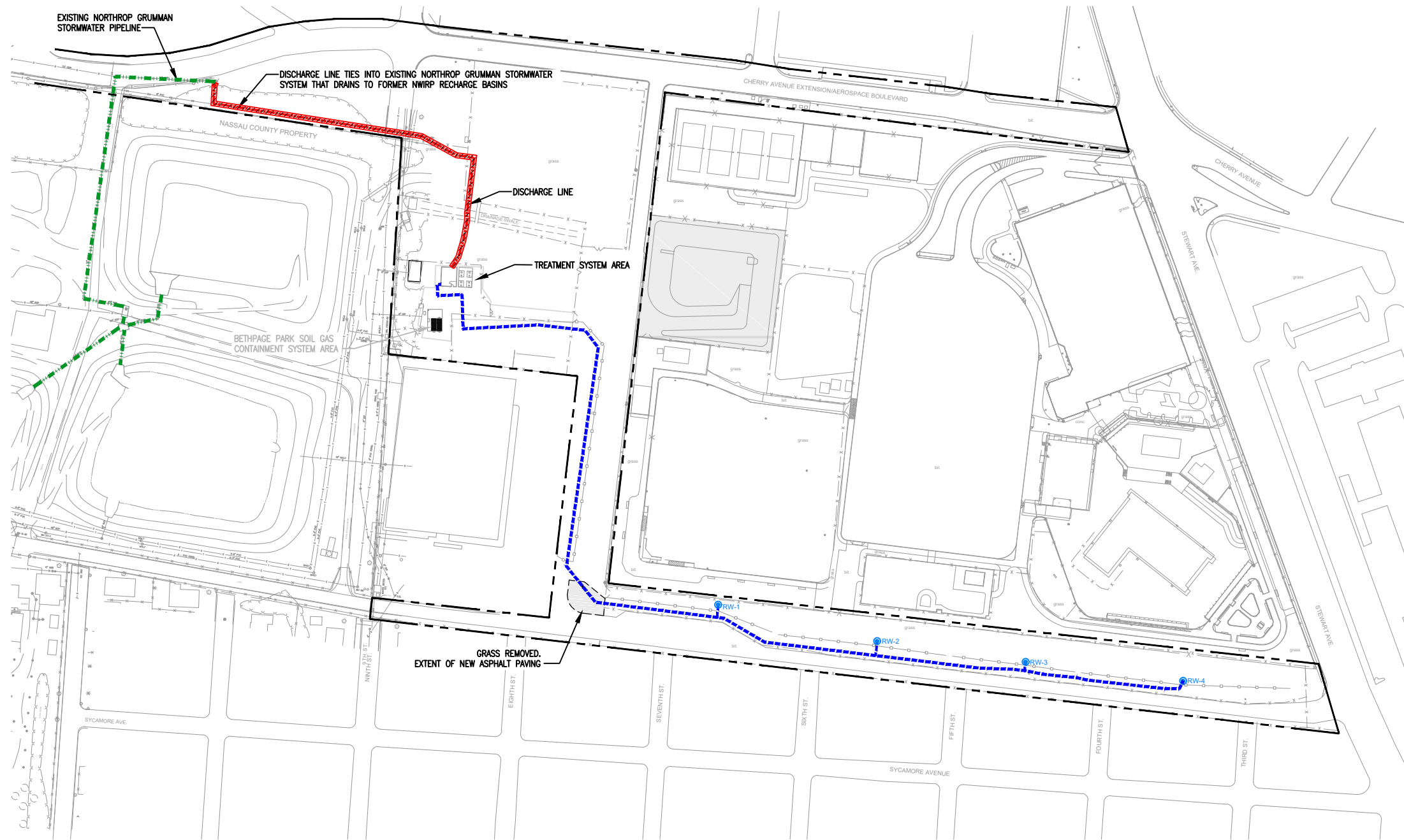
Notes, Abbreviations, Qualifiers, and Units:

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 USEPA 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.
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.

| | |
|--------|---|
| 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 |
| 1.2 | 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 |

Figures



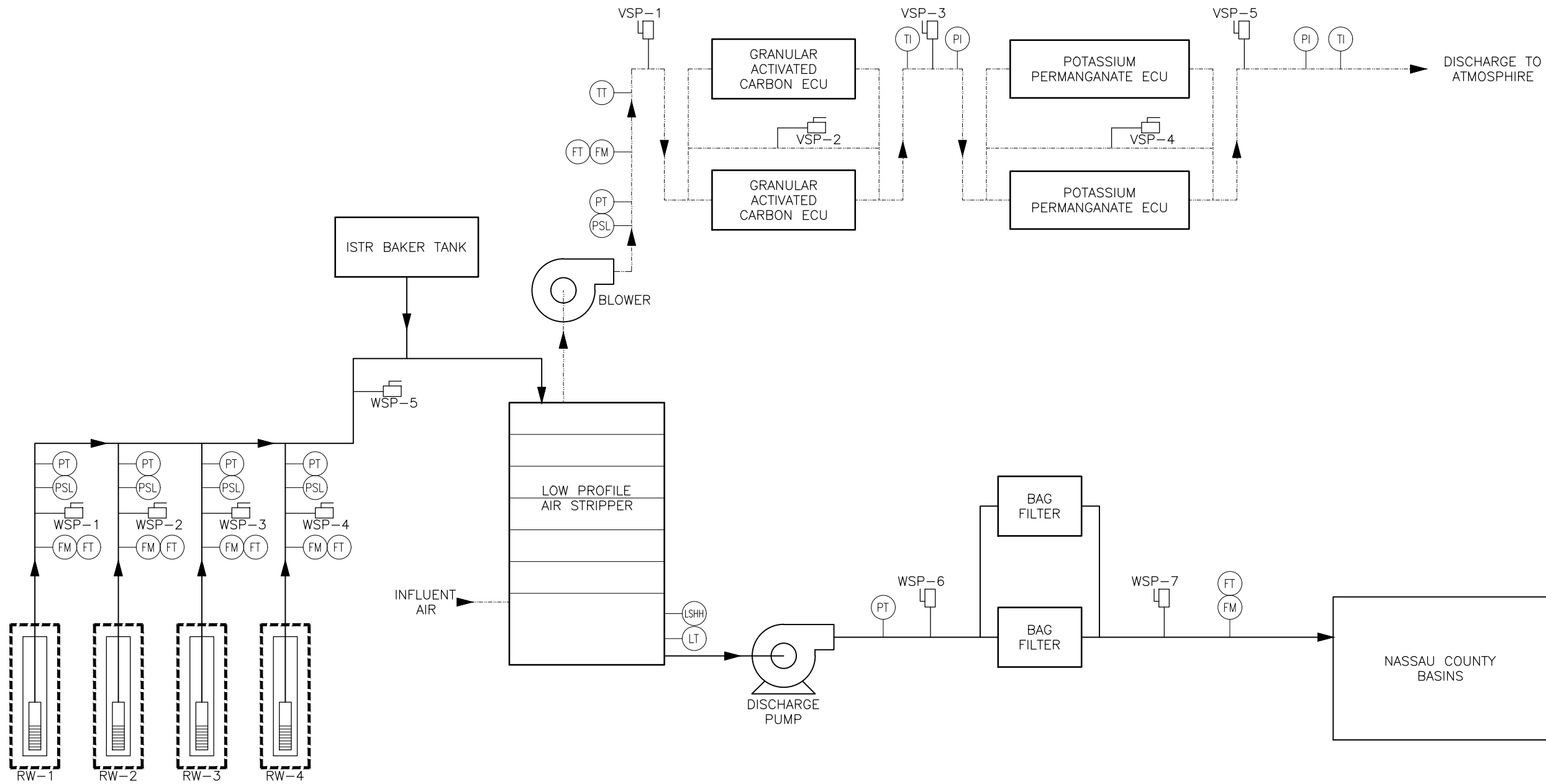
- LEGEND:**
- NORTHROP GRUMMAN PROPERTY LINE
 - - - - - FENCE
 - ||||| BITUMINOUS PAVEMENT
 - INFLUENT PIPELINE AND ELECTRICAL CONDUITS
 - ||||| EFFLUENT PIPELINE
 - EXISTING NORTHROP GRUMMAN STORMWATER PIPELINE
 - RW-4 ● REMEDIAL WELL
 - NWIRP NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NOW OWNED BY NASSAU COUNTY)



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

SITE AND GROUNDWATER CONTAINMENT SYSTEM





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

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

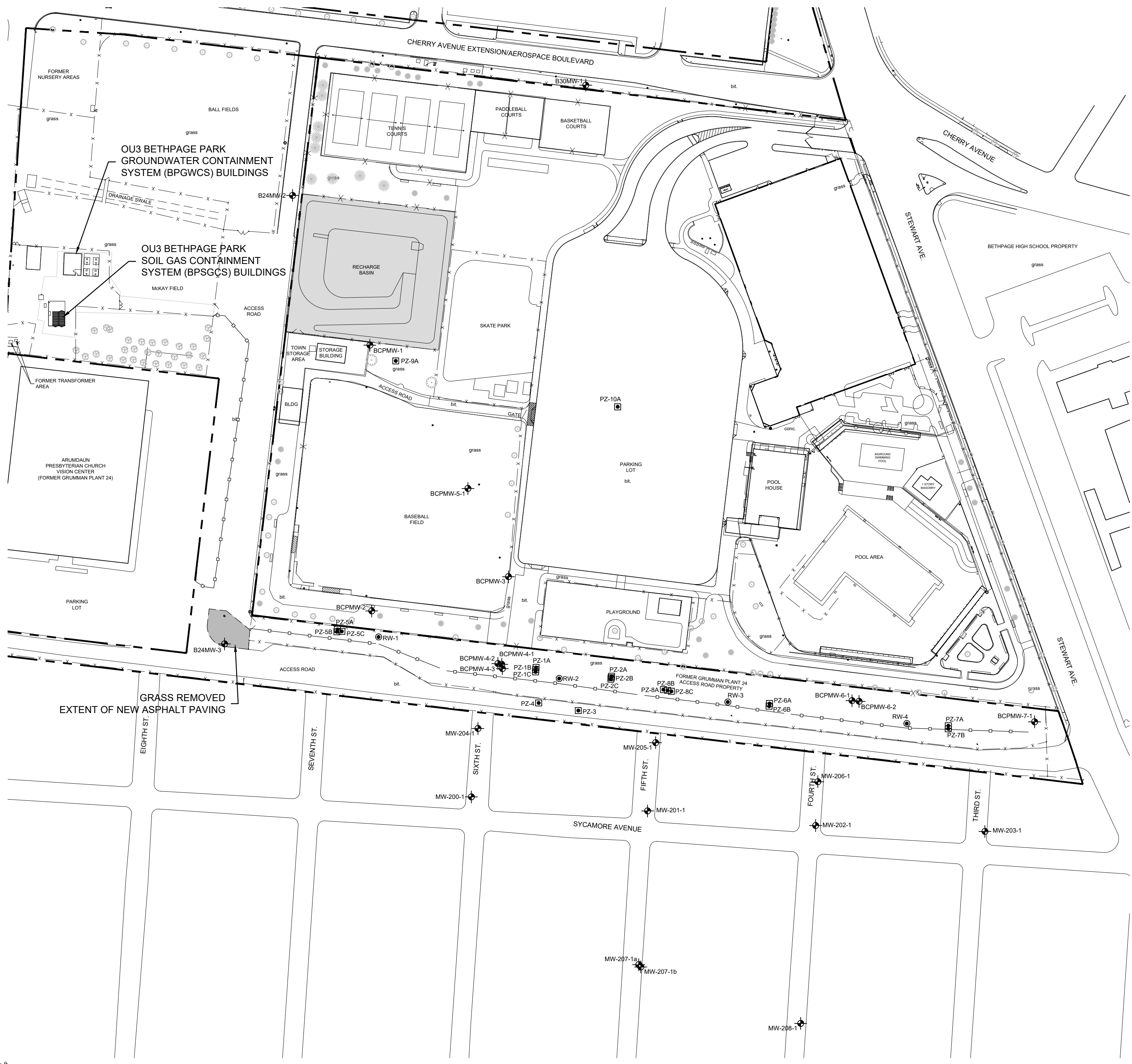
**GROUNDWATER TREATMENT SYSTEM
PROCESS SCHEMATIC,
PROCESS FLOW DIAGRAM,
AND MONITORING LOCATIONS**



FIGURE

3

CITY:SYRACUSE:ENV DIV:GROUP:ENV DB:A SANCHEZ LDALS PIC:004 PM:Read TM:04 LVR:000000-OFF-REF-
C:\Users\asanchez\OneDrive - ARCADIS\BIM\300 Docs\NORTHROP GRUMMAN\COMM\141466RPH401.dwg LAYOUT:4 SAVED: 01/19/2018 7:41 PM ACADVER: 21.08 (LMS TECH) PAGESETUP: PLOTSTYLETABLE: PLOTSTYLETABLE: PLOTTED: 8/10/2018 1:18 PM BY: SANCHEZ, ADRIAN
AREAS: IMAGES: PROJECTNAME: X:\SITE-BASE SITE XT1466R4



EXPLANATION:

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

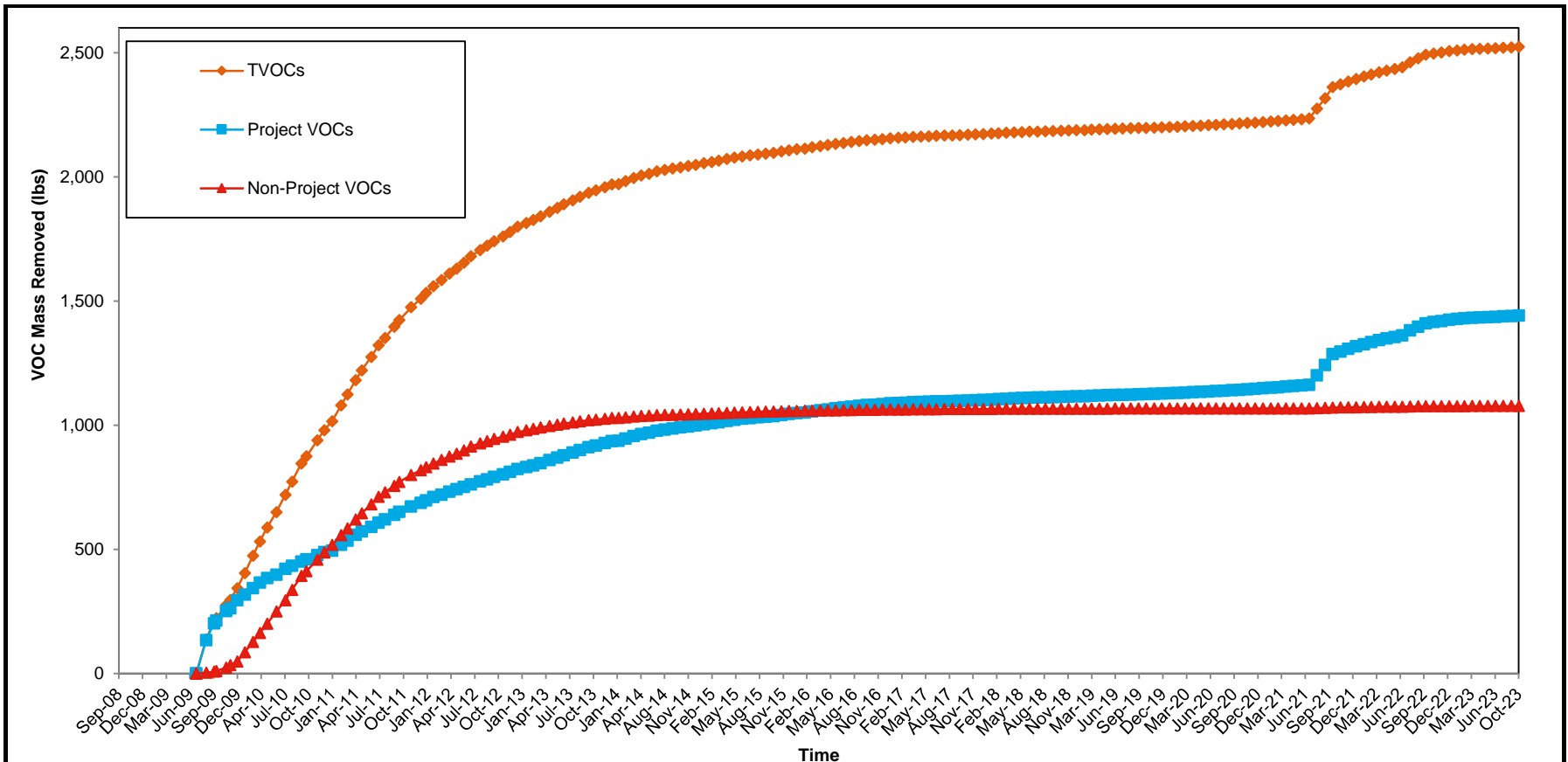
NOTES:

1. MONITORING WELLS, REMEDIAL WELLS, AND PIEZOMETERS SURVEYED TO NORTH AMERICAN DATUM (NAD) 83.

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

**GROUNDWATER MONITORING NETWORK
SITE PLAN**

ARCADIS | FIGURE 4



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)
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.

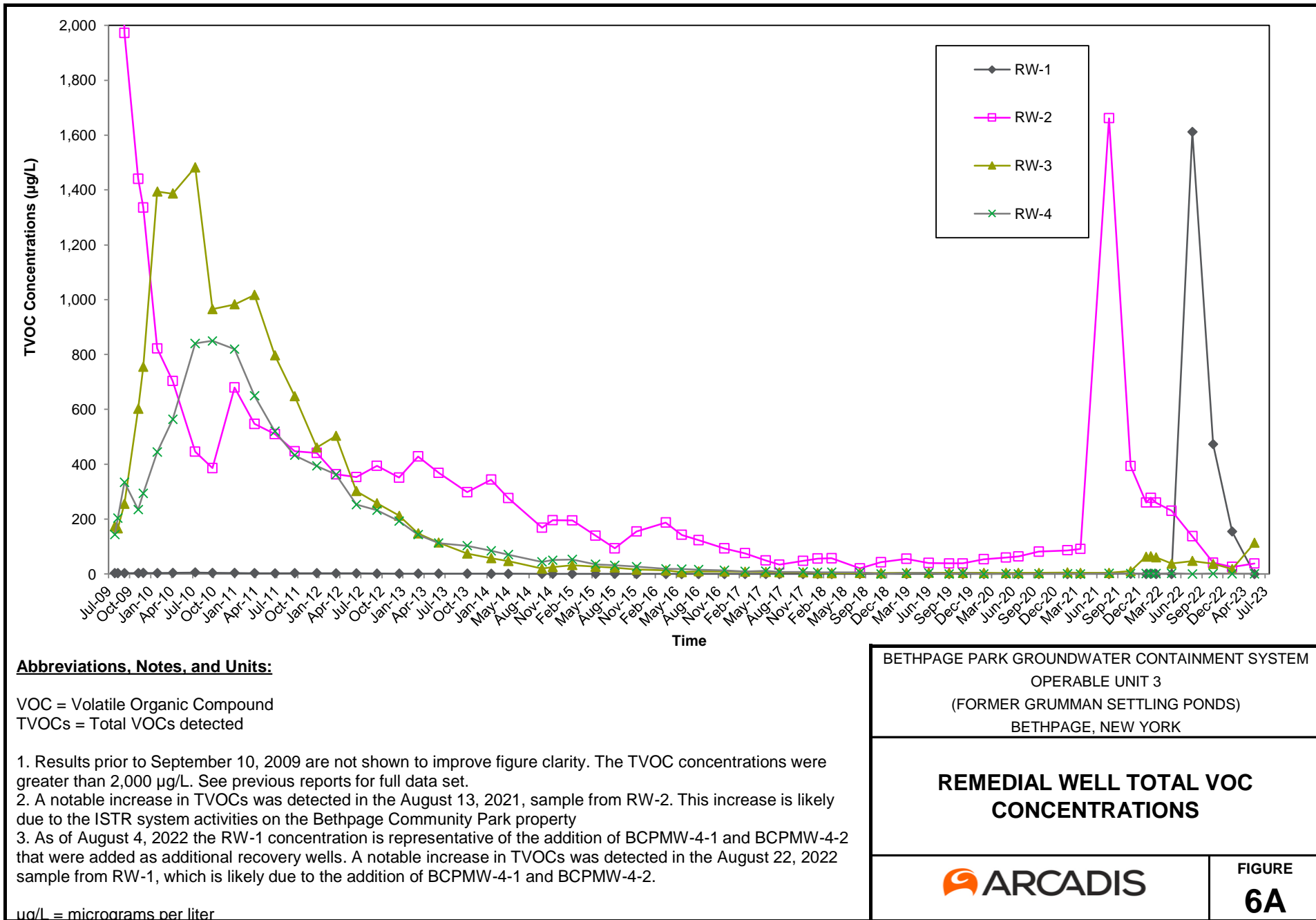
lbs = pounds

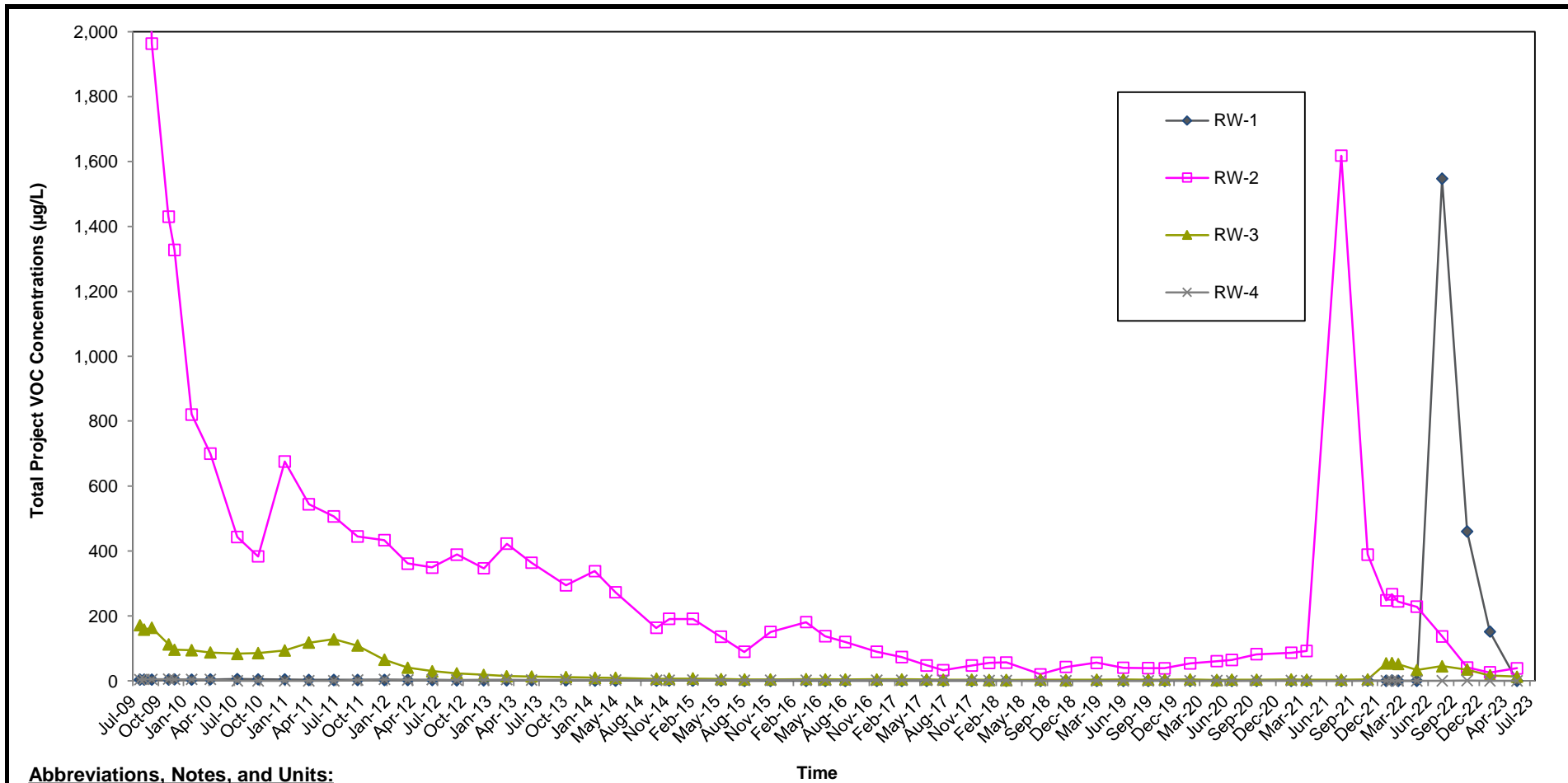
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
 OPERABLE UNIT 3
 (FORMER GRUMMAN SETTLING PONDS)
 BETHPAGE, NEW YORK

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



FIGURE
5





Abbreviations, Notes, and Units:

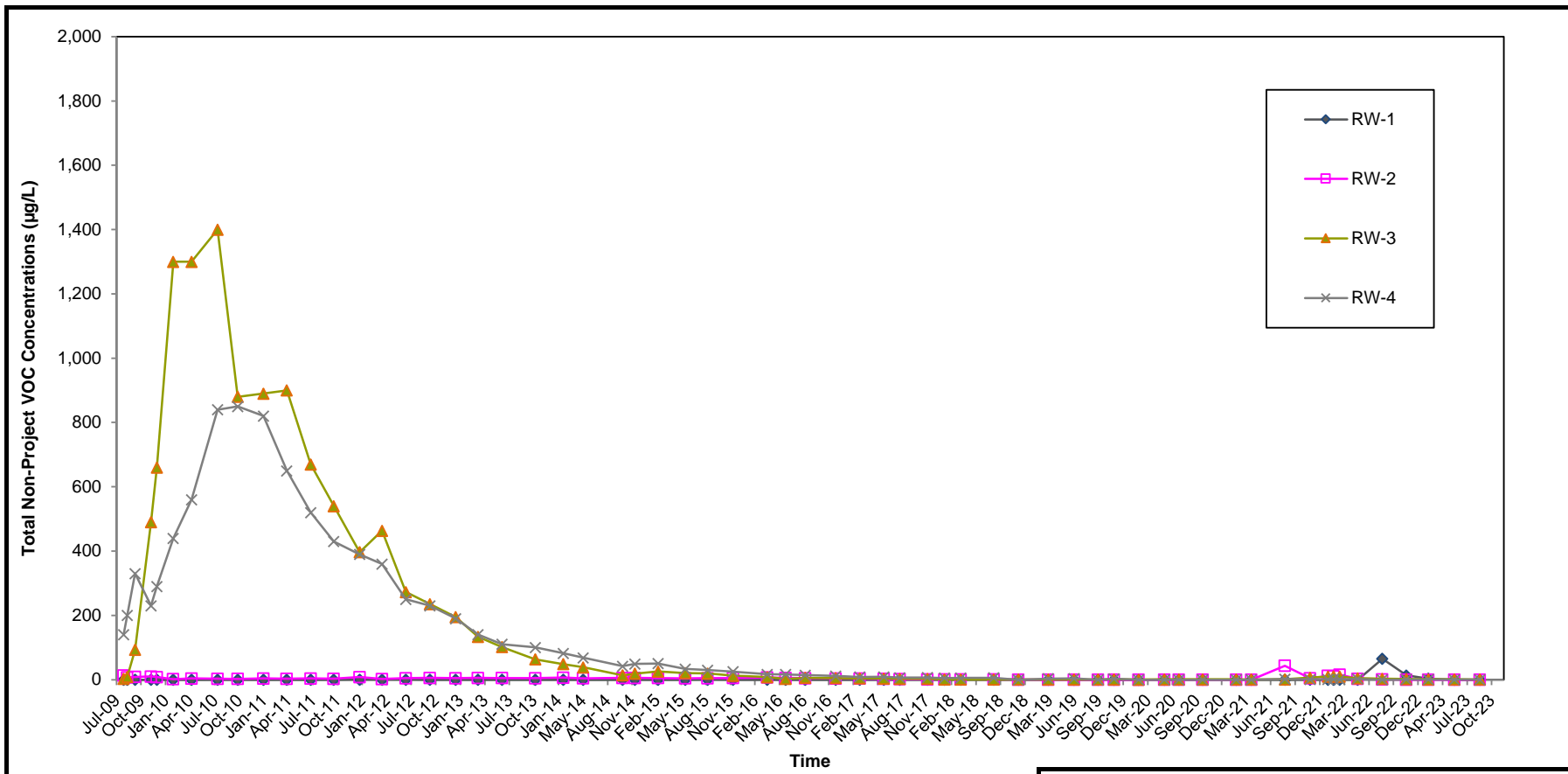
VOC = Volatile Organic Compound
 TVOCs = Total VOCs detected

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 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.
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.

µg/L = micrograms per liter

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|--|-------------------------------|
| BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM OPERABLE UNIT 3 (FORMER GRUMMAN SETTLING PONDS) BETHPAGE, NEW YORK | |
| REMEDIAL WELL PROJECT VOC CONCENTRATIONS | |
| | 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.

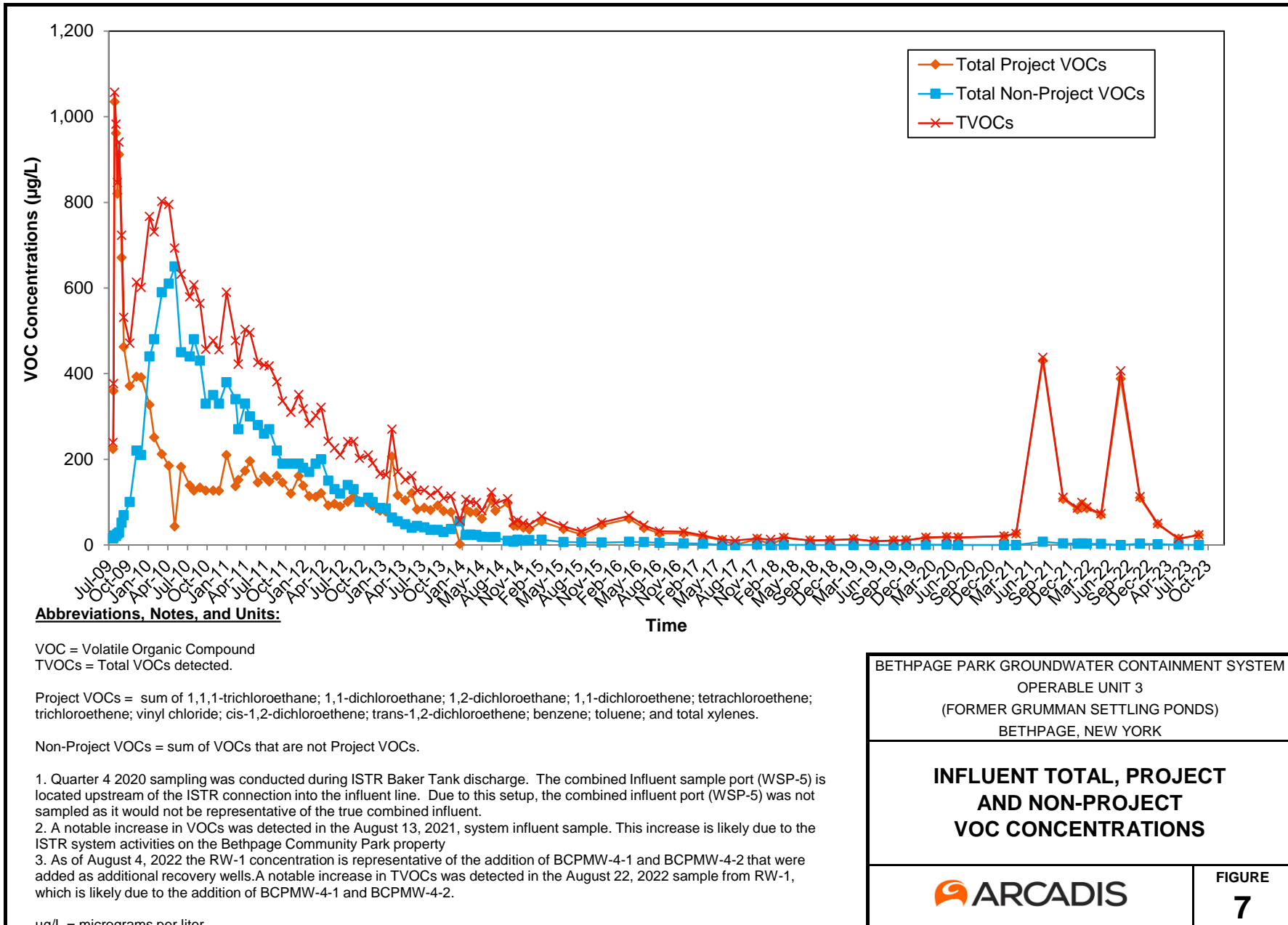
1. As of August 4, 2022 the RW-1 concentration is representative of the addition of BCPMW-4-1 and BCPMW-4-2 that were added as additional recovery wells. A notable increase in TVOCs was detected in the August 22, 2022 sample from RW-1, which is likely due to the addition of BCPMW-4-1 and BCPMW-4-2.

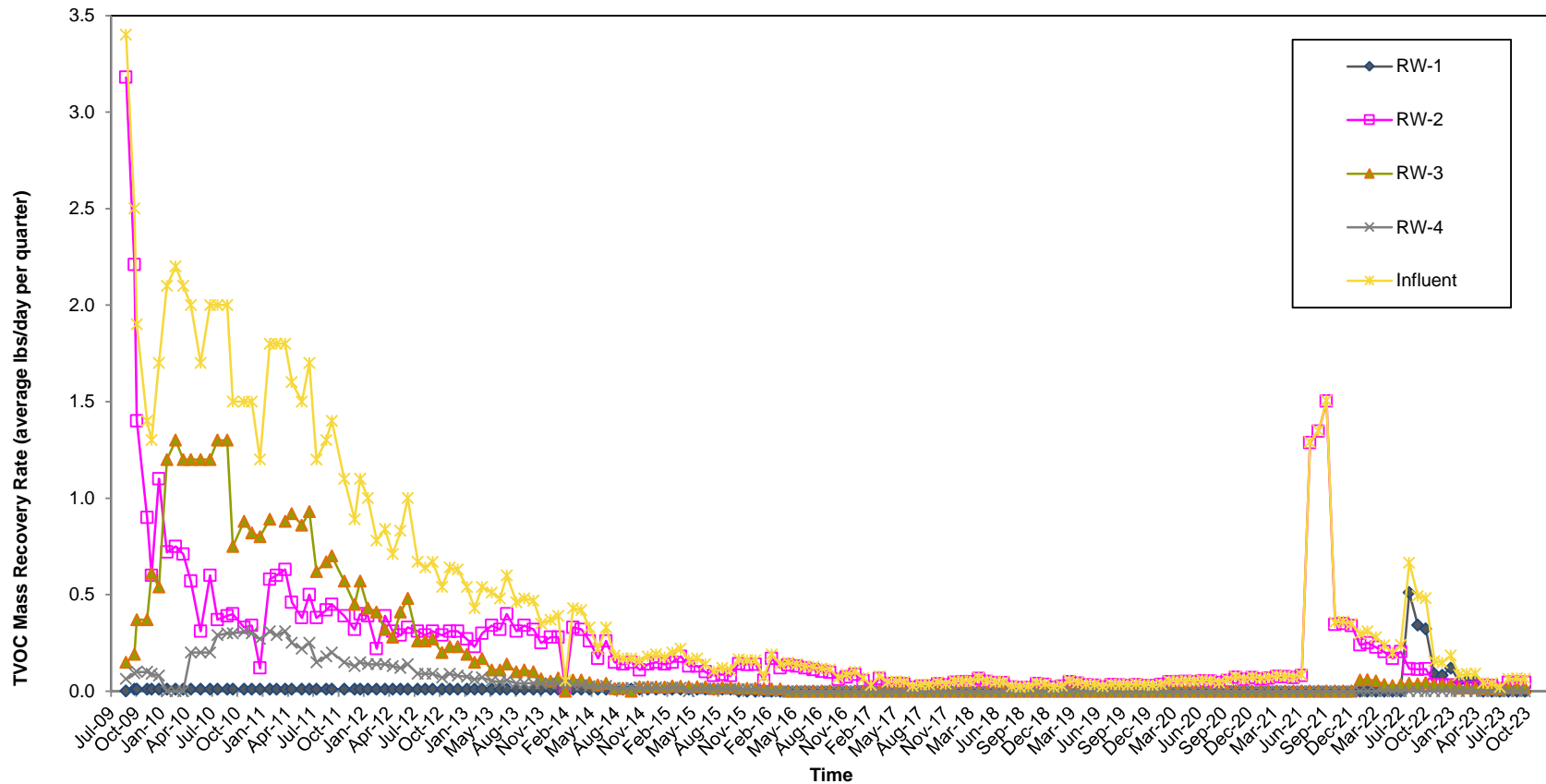
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
 OPERABLE UNIT 3
 (FORMER GRUMMAN SETTLING PONDS)
 BETHPAGE, NEW YORK

**REMEDIAL WELL NON-PROJECT VOC
 CONCENTRATIONS**



FIGURE
6C



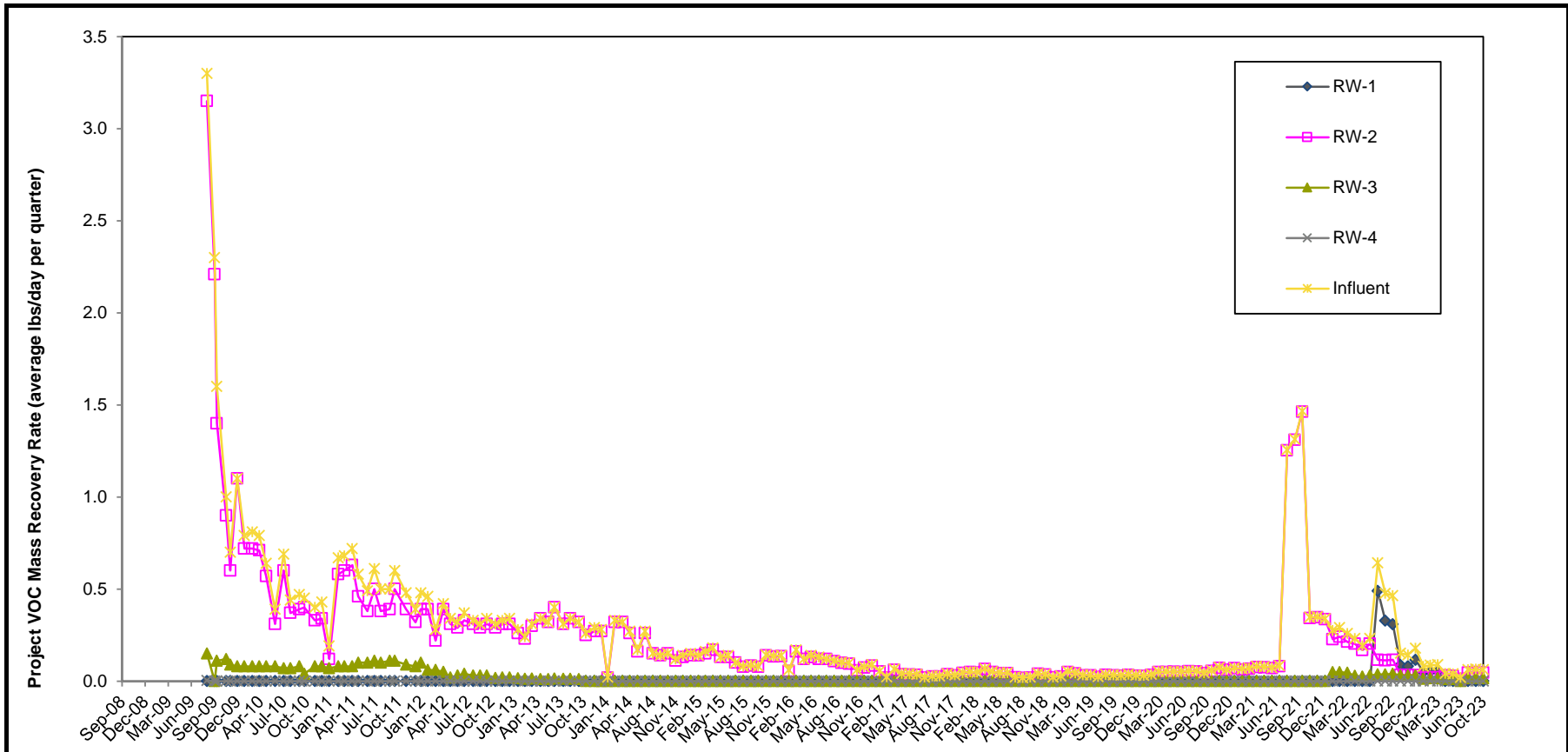


Abbreviation, Notes, and Units:

VOC = Volatile Organic Compound
 TVOCs = Total VOCs

1. A notable increase in TVOC mass recovery rates was observed between Q3 2021 and Q1 2022 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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| BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM OPERABLE UNIT 3 (FORMER GRUMMAN SETTLING PONDS) BETHPAGE, NEW YORK | |
| 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 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

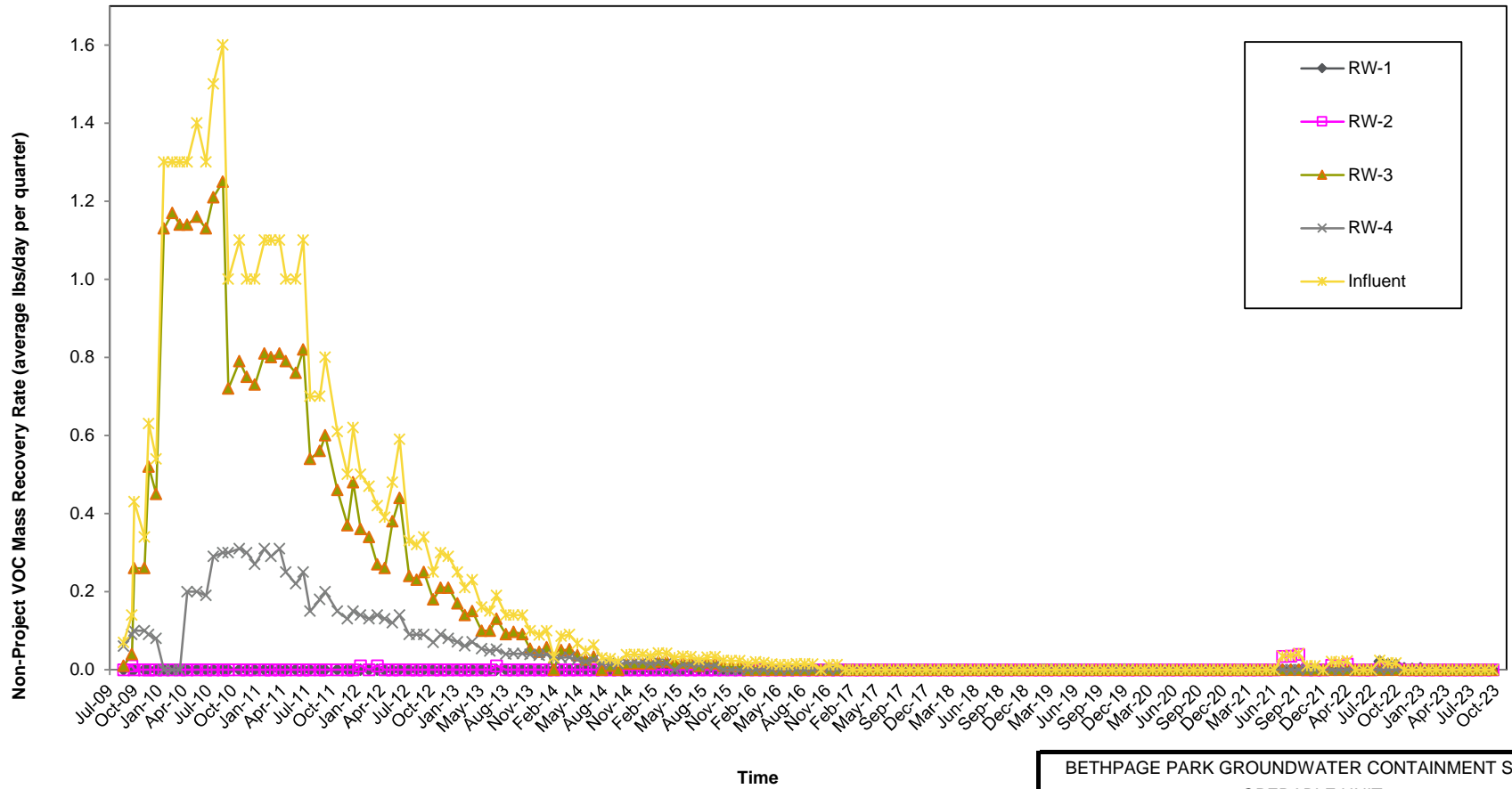
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BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
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BETHPAGE, NEW YORK

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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| BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM OPERABLE UNIT 3 (FORMER GRUMMAN SETTLING PONDS) BETHPAGE, NEW YORK | |
| NON-PROJECT VOC MASS RECOVERY RATES | |
|  | FIGURE 8C |