December 2023 Semi-Annual Groundwater Monitoring Report Patchogue Former MGP Site NYSDEC Site No. 1-52-182 Village of Patchogue, Suffolk County, New York

Prepared for
National Grid USA
175 East Old Country Road
Hicksville, New York 11801

February 26, 2024

Project Number: 153021.805.017

Brown and Caldwell Associates
500 North Franklin Turnpike, Suite 314
Ramsey, New Jersey 07446

Table of Contents

Appendices

List of Tables

List of Figures

List of Abbreviations

BC	Brown and Caldwell Associates
BTEX	Benzene, Toluene, Ethylbenzene, and Isomers of Xylene
DUSR	Data Usability Summary Report
EDD	Electronic Data Deliverable
ELAP	Environmental Laboratory Approval Program
EPA	U.S. Environmental Protection Agency
EQuIS	Environmental Quality Information System
FER	Final Engineering Report
ISS	In Situ Solidification
Lancaster	Eurofins Lancaster Laboratories Environmental
MGP	Manufactured Gas Plant
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAPL	Non-Aqueous Phase Liquid
NYCRR	New York State Code of Rules and Regulations
NYSDEC	New York Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polycyclic Aromatic Hydrocarbon
QA/QC	Quality Assurance/Quality Control
RDR	Remedial Design Report
SIM	Selective Ion Monitoring
Site	Patchogue Former MGP Site
SMP	Site Management Plan
TOGS	Technical and Operational Guidance Series
µg/L	micrograms per liter

Section 1

Introduction

This Groundwater Monitoring Report documents the implementation and summarizes the results of the groundwater monitoring activities conducted during the December 2023 semi-annual sampling event at the Patchogue Former Manufactured Gas Plant (MGP) Site (hereinafter referred to as the "Site"). The Site remedy was completed in December 2019, which included in situ solidification (ISS) of MGP-related source materials and associated soils. The December 2023 groundwater monitoring activities included the performance of water level measurements, non-aqueous phase liquid (NAPL) gauging and groundwater sampling activities.

The groundwater monitoring event and the preparation of this report are part of the long-term groundwater monitoring program being conducted at the Site in accordance with the Site Management Plan (SMP) prepared by Brown and Caldwell Associates (BC), February 2023. This report has been prepared for submittal to the New York State Department of Environmental Conservation (NYSDEC) and includes the following:

- Description of the scope of the field activities, methods, and procedures
- Table summarizing the results of the water level measurements and the gauging for the presence of NAPL in the monitoring wells (Table 1)
- Table summarizing the analytical results for the groundwater samples obtained during the December 2023 semi-annual groundwater monitoring event including a comparison to the applicable groundwater quality criteria (Table 2)
- Comparison of data from this monitoring period to data from historical monitoring events (Tables 3 and 4)
- Discussion of the results and findings from the groundwater monitoring data
- A water table elevation contour map depicting the generalized direction of groundwater flow based on groundwater elevation data obtained from monitoring wells (Figure 1)
- Water quality trend plots for select constituents (Figures 2 through7)
- Field Sampling Data Sheets (Appendix A)
- Laboratory Data Report (Appendix B)
- Data Validator Qualifications (Appendix C)
- Data Usability Summary Report (DUSR) (Appendix D)
- Evaluation of Potential Impact to River from Site Constituents in Groundwater (Appendix E)
- Evaluation of Potential Impact to River from Increased pH Levels in Groundwater (Appendix F)

1.1 Background

This report presents the results and findings associated with the December 2023 semi-annual groundwater monitoring event. Groundwater conditions prior to remedy implementation are documented and discussed in previous groundwater monitoring reports dating back to 2009 and in the "Final Remedial Investigation Report for the Patchogue Former MGP Site" (Tetra Tech EC, Inc., December 2009). Remedial construction activities, which included the use of ISS of MGP-related source materials and associated soils, were performed during the period from June through

December 2019. Final Site restoration efforts were completed in the July of 2020. At the end of 2018, groundwater monitoring was suspended to allow for remedial construction activities. Several monitoring wells and piezometers were decommissioned prior to remedial construction activities to facilitate remedy implementation. These wells included MW-5, MW-6, MW-9S, MW-9D, and PZ-1A through PZ-4A. Each well/piezometer was decommissioned in accordance with NYSDEC's guidance document "CP-43: Groundwater Monitoring Well Decommissioning Policy". A description of the decommissioning activities, as well as field inspection logs and well decommissioning records were provided under separate cover in the "Final Engineering Report" (FER, BC, February 2022).

Prior to resumption of groundwater monitoring following remedial construction activities, five monitoring well couplets (MW-10S/D through MW-14S/D) were installed in January 2020 to facilitate performance of a long-term groundwater monitoring program at the Site. These additions to the well network were installed in accordance with the "100% Remedial Design Report" (RDR, BC, May 2019) as modified by subsequent email correspondence (during the period from January 7 to January 16, 2020) between National Grid and the NYSDEC. These wells are supplemental to previously installed wells (MW-1 and MW-3) and well couplets (MW-4S/D, MW-7S/D, and MW-8S/D), which serve as Site perimeter monitoring locations. The well couplets installed in January 2020 were selected to provide additional well coverage for post-remediation groundwater quality monitoring at locations positioned around the ISS mass, and at locations between the ISS mass and the adjacent Patchogue River. The screens of the monitoring wells provide coverage across the vertical extent of the ISS mass. Monitoring well construction logs for the well couplets installed in January 2020 were provided in Appendix C of the SMP (BC, February 2023).

Groundwater monitoring prior to remedy implementation was conducted on a semi-annual basis; however, the sampling frequency was temporarily increased to quarterly directly after remedy implementation to evaluate the effectiveness of the remedy for Calendar Years 2020 and 2021. Following completion of eight quarters of post-remediation monitoring and evaluation of the data, National Grid proposed several modifications to the long-term post-remedial groundwater monitoring program for the Site for review and approval by the NYSDEC. Specifically, based on the results of the 2020 and 2021 quarterly monitoring activities, the following modifications were proposed in the Fourth Quarter 2021 Groundwater Monitoring Report (BC, March 2022):

- **Elimination of deeper monitoring wells from groundwater monitoring program:** Monitoring of the deep groundwater (8 well locations) is no longer warranted. Eight quarters of groundwater sampling have been conducted since completion of remedy implementation. MGP-related constituents were not detected or detected at very low levels (below New York State Class GA groundwater quality criteria) in the deep groundwater wells during these eight sampling events.
- **Removal of methyl tertiary-butyl ether from analyte list:** This non-MGP-related constituent has been detected several times dating back to 2011 at very low concentrations below its Class GA criterion at a single location (MW-8S) and thus, removal of this constituent from the analyte list was recommended.
- **Changing the frequency of groundwater monitoring from quarterly to semi-annually:** Tables 3 and 4 of the above-referenced report provide historical total benzene, toluene, ethylbenzene, and isomers of xylene (BTEX) compounds and total polycyclic aromatic hydrocarbon (PAH) concentration data, respectively, and based on a review of the 2020 and 2021 data in these tables, it is evident that the concentrations of more mobile constituents (i.e., BTEX compounds) increased shortly after completion of the remedy followed by increases in concentrations of less mobile PAH compounds in wells downgradient of the ISS mass. The BTEX concentrations have decreased throughout Calendar Years 2020 and 2021, while the PAH concentrations appear to have plateaued and are anticipated to decrease following this plateau. Sampling on a semi-annual basis is adequate for assessing groundwater quality conditions at the Site.

The NYSDEC approved the above-recommended modifications in an email dated April 13, 2022, with the exception of allowing the removal of deep monitoring well locations MW-12D and MW-13D from the monitoring program. Monitoring of both shallow and deep groundwater downgradient of the ISS mass at these two monitoring well locations will continue as part of the semi-annual groundwater monitoring events.

Section 2

Scope of Work

Field activities for the December 2023 semi-annual groundwater monitoring were conducted by BC on December 13 and 14, 2023. The activities conducted during this monitoring event are described below. Locations of the monitoring wells and staff gauges referenced below are depicted on Figure 1.

Prior to groundwater sampling, water level measurements and NAPL gauging was performed in the monitoring wells associated with the Site. The level of the Patchogue River was measured from surface water elevation control points at staff gauges SG-1 and SG-2. Water level measurements and NAPL gauging were conducted using an electronic oil/water interface probe and measured to the nearest 0.01 foot.

Groundwater sampling was conducted at 12 monitoring wells (MW-1, MW-3, MW-4S, MW-7S, MW-8S, MW-10S, MW-11S, MW-14S; and well couplets MW-12S/D and MW-13S/D) following the water level and NAPL gauging activities using low-flow purging and sampling techniques in accordance with the U.S. Environmental Protection Agency (EPA) protocol (EPA, July 1996, Revised September 2017). Samples were submitted to Eurofins Lancaster Laboratories Environmental (Lancaster) located in Lancaster, Pennsylvania. Lancaster is certified (Certification No. 10670) through the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

The groundwater samples were analyzed for BTEX compounds using EPA SW-846 Method 8260C, and PAHs using EPA SW-846 Method 8270D. The selective ion monitoring (SIM) component of the 8270 analysis was also performed on the samples to obtain lower detection limits for certain PAH compounds. The groundwater samples were also analyzed in the field for pH, specific conductivity, temperature, turbidity, oxidation-reduction potential, and dissolved oxygen (see Appendix A for field sampling data sheets).

The laboratory report from Lancaster is provided in Appendix B. Laboratory analytical data were provided to BC in electronic form by Lancaster and have been incorporated into the environmental database maintained by BC for the Site.

In addition to the samples described above, quality assurance/quality control (QA/QC) samples were also collected. The QA/QC samples included: trip blanks (one per cooler containing samples for BTEX analysis), a field duplicate, and an equipment blank. Also, extra sample volume was collected from one location to provide for matrix spike/matrix spike duplicate (MS/MSD) analysis. The trip blank sample was analyzed for BTEX only. The other QA/QC samples were analyzed for BTEX and PAHs.

The groundwater analytical data packages were validated by Jeff Davin of BC. Mr. Davin's qualifications and experience as a data validator are included in Appendix C. A DUSR was prepared for the groundwater data packages (see Appendix D). Overall, the data is acceptable for the intended purposes. No analytical issues were found.

Following receipt of the validated data from the December 2023 groundwater monitoring activities, the validated data was incorporated into a comprehensive analytical database for the Site. These data were then formatted to the NYSDEC's environmental data submission requirements that are

detailed on the NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html). This included: 1) populating the NYSDEC Electronic Data Deliverable (EDD) with the analytical data; 2) validating the EDD using the database software application Environmental Quality Information System (EQuIS™) from EarthSoft®, Inc.; and 3) submitting the validated EDD to the NYSDEC.

Section 3

Results and Findings

3.1 Water Level Data

Table 1 provides the water level data and calculated water elevations from the December 13, 2023 measurements. Figure 1 illustrates the elevation contours of the water table based on these data. The contours were developed using water level elevation data from the shallow monitoring wells (i.e., those with screens that straddle, or are just below, the water table) considered representative of the water table, and the staff gauges in the Patchogue River. The groundwater elevation (hydraulic head) values for the wells screened in deeper intervals are also posted for reference on Figure 1. The water table is relatively shallow and is typically positioned in the fill that overlies the native alluvial deposits and outwash deposits and that overlies the ISS mass. The water table contours indicate that lateral groundwater flow is from the northwest to the south and southeast across the Site toward the Patchogue River.

3.2 NAPL Gauging

Table 1 presents the results of the NAPL gauging conducted in the monitoring wells associated with the Site during the December 2023 groundwater monitoring event. NAPL was not identified in any of the Site monitoring wells during the December 13, 2023 gauging activities.

3.3 Groundwater Quality Data

Table 2 provides the results of the laboratory analyses of the groundwater samples collected during the December 2023 semi-annual monitoring event and a comparison of the data to the New York State Class GA groundwater quality criteria (i.e., New York State Codes, Rules and Regulations (NYCRR) Part 703 groundwater standards for Class GA water (groundwater) or, for constituents with no standard, the corresponding guidance value from Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1). Comparisons of total BTEX and total PAH concentrations from this sampling event to previous sampling events are provided as Tables 3 and 4, respectively. Figures 2 through 4 present constituent concentration trend plots for acenaphthene, benzene and naphthalene, respectively; one or more of these constituents have been detected at concentrations above the Class GA groundwater quality criteria at well locations MW-3, MW-4S, MW-11S, and MW-13S during the post-remediation monitoring period, which was initiated in March 2020.

Groundwater samples were collected from the 12 monitoring wells listed in Table 2 from December 13 and 14, 2023 and submitted to the laboratory for analysis of BTEX and PAHs. During the December 2023 sampling, acenaphthene was detected above its Class GA groundwater quality criterion at wells MW-3 and MW-11S. Naphthalene was detected above its Class GA groundwater quality criterion in the sample from MW-3. These constituents are considered Site related and potentially mobile in groundwater. The presence of these constituents in groundwater at these locations is an expected result of the disturbance of the subsurface during implementation of the ISS; the elevated concentrations are expected to decrease with time. As shown on Figures 3 and 4, the constituents that have exceeded Class GA criteria during the post-remediation monitoring conducted to-date show an overall decrease in concentration from the highest concentrations detected following remediation. In these wells, one or more the following PAH compounds were also

detected at concentrations above Class GA groundwater quality criteria: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene. As discussed further below in this section, these PAHs have very low aqueous solubilities, and their detection may not represent constituents that are mobile in groundwater.

Prior to remediation in the area downgradient of the MGP-related source materials, acenaphthene, benzene and naphthalene were either not detected or detected at concentrations below Class GA groundwater quality criteria in the wells that were in place prior to remedy implementation. Overall, the concentrations have decreased somewhat from the higher concentrations measured earlier in the post-remediation monitoring period, which was initiated in March 2020 (see constituent concentration trend plots presented as Figures 2 through 4). These concentrations are anticipated to further decrease with time and will be evaluated during subsequent monitoring events. For instance, benzene concentrations have been detected below Class GA criteria apart from occasional slight exceedances at MW-11S and MW-13S (see Figure 3). Additionally, acenaphthene concentrations have decreased since post-remedy peak concentrations aside from MW-11S (see Figure 2). As shown on Figure 4, naphthalene concentrations have also decreased substantially since post-remedy peak concentrations at locations where it has exceeded Class GA criteria (i.e., MW-3 and MW-13S). Further, naphthalene has not been detected in MW-13S since the June 2022 monitoring event.

In addition to the above-described detections at wells MW-3, MW-11S, and MW-13S, benzo(a)anthracene (a PAH compound) was detected in samples collected from monitoring well MW-1 at a low concentration (i.e., at or slightly above the laboratory method detection limit), but above the Class GA groundwater quality criterion, during the December 2023 semi-annual monitoring event.

The PAH compounds identified in the groundwater samples from MW-1, MW-3, MW-11S, and MW-13S at concentrations above the Class GA groundwater quality criteria include one or more of the following five compounds: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene. These PAH compounds have very low aqueous solubilities, are not readily mobile in groundwater, and are unlikely to have migrated from the on-Site source area. The criteria that were exceeded for four of these five PAHs are unpromulgated guidance values rather than 6 NYCRR Part 703 standards. The criteria for the fifth PAH, benzo(a)pyrene, is a Part 703 standard. The standard for benzo(a)pyrene is “non-detect” and the guidance value for the other four PAHs, 0.002 micrograms per liter (µg/L), is approximately an order of magnitude below the method detection limit. Therefore, any detection of these compounds in groundwater will result in an exceedance. The detection of these constituents in the monitoring locations is likely related to the disturbance of fine or colloid sized particles during purging or sampling activities. These particles are derived from within the well or the soil adjacent to the well that become suspended into the water column of the well as a result of disturbance during purging and sampling activities.

As described above in Section 3.1, groundwater flow is from the northwest to the south and southeast across the Site toward the Patchogue River. The concentrations of some of the constituents that were detected and potentially mobile in the dissolved phase (benzene and ethylbenzene) continue to be below applicable surface water quality criteria listed in the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004) that are applicable to the Patchogue River (the portion of the Patchogue River proximal to the Site is classified as a Class C water body per 6 NYCRR Part 897). Therefore, they do not have the potential to impact surface water quality in the Patchogue River.

The concentration of one or more of the following seven constituents were detected above their respective applicable surface water quality criteria in downgradient monitoring wells proximal to the

river (MW-3 and MW-4S): acenaphthene, benzo(a)anthracene, benzo(a)pyrene, fluorene, naphthalene, phenanthrene, and pyrene. Although not anticipated to impact surface water quality if they discharged to the river, some of these compounds have very low aqueous solubilities and thus low potential for migration (i.e., benzo(a)anthracene and benzo(a)pyrene – see discussion at end of this section), a mass flux analysis was previously conducted (provided in Appendix E) to assess the potential for discharge of Site-related constituents in shallow groundwater to impact water quality in the Patchogue River. The evaluation was conducted by estimating the rate at which a mass of Site-related constituents dissolved in groundwater may be contributing to the surface water in the Patchogue River (i.e., the mass flux of constituents from groundwater to surface water). Based on the analysis, it was determined that the estimated concentrations of acenaphthene, benzo(a)anthracene, benzo(a)pyrene, fluorene, naphthalene, phenanthrene, and pyrene in the river water resulting from the discharge of groundwater from the Site were below applicable surface water quality criteria. The details of these constituent mass flux analyses are presented in Appendix E; the results are summarized below.

The concentrations of acenaphthene, benzo(a)anthracene, benzo(a)pyrene, fluorene, naphthalene, phenanthrene, and pyrene in the December 2023 samples were similar (within the same order of magnitude) to those in the 2020 samples (i.e., the initial post-remediation samples), yet the concentrations appear to be either stabilizing or trending downwards (see groundwater quality trend plots for fluorene and pyrene presented as Figures 5 and 6, respectively). Since the estimated concentrations of these seven constituents in surface water, as derived from the previous mass flux analyses using data from 2020, were below applicable surface water criteria (see Appendix E), an additional estimation of concentrations of these constituents in the river is not necessary. Based on the evaluation conducted, Site-related constituents in shallow groundwater do not impact surface water quality in the Patchogue River.

As discussed in previous monitoring reports, following implementation of the remedy, pH levels in two wells downgradient of and proximal to the ISS mass were found to have pH levels above the Class GA criteria range of 6.5 to 8.5. Specifically, after remedy implementation, monitoring data has shown that the pH level in MW-3 began to increase above levels measured prior to remedy implementation (typically ±6.9), up to levels greater than 11. Also, samples from well MW-13S, installed at the end of remedy implementation, showed an increase in pH levels to as high as 9.88. The increased pH levels are considered an effect from implementation of ISS and are anticipated to decrease to pre-remedy levels with time. Due to the low permeability of the ISS mass, the flux of groundwater in the area immediately downgradient of the ISS mass (proximal to well locations MW-3 and MW-13S) is greatly reduced. This is consistent with the findings from the groundwater flow model developed during the remedial design. Therefore, the rate at which the groundwater with an elevated pH (i.e., elevated hydroxide ion concentration) is flushed from this area is expected to be very low. The presence of new asphalt pavement over this area likely further contributes to the reduction in flushing due to decreased infiltration of precipitation. This, coupled with the uncertainty regarding the timeframe over which the Portland-cement-based ISS material can generate elevated pH levels in close proximity to the ISS mass, makes predicting the timeframe for pH levels to return to pre-remediation levels difficult. As shown on Figure 7, the pH levels at MW-13S are, in general, declining and have been below 8.5 (upper level of Class GA criterion range) in two of the last three monitoring events, including this event. However, the pH levels at MW-3 show an overall increasing trend, with the level recorded during the December 2023 sampling (11.31). Although the increased pH levels in groundwater are not anticipated to impact surface water quality in the Patchogue River, similar to the above-described evaluation, an analysis was previously conducted to evaluate the potential for the increased pH levels to effect surface water quality in the river. The details of this pH mass flux analysis are presented in Appendix F. Since the pH levels measured in MW-3 and MW-13S in December 2023 are within an order of magnitude or less to the levels measured in December

2020 and the estimated pH level in surface water (based on the December 2020 field measurements) was below applicable surface water criteria, an additional estimation of the pH level in the river is not necessary. Based on the evaluation conducted, the increased pH levels in shallow groundwater do not impact surface water quality in the Patchogue River.

Section 4

Summary and Conclusions

The following is a summary of the findings and conclusions associated with the December 2023 groundwater monitoring event.

- NAPL was not identified in any of the Site monitoring wells during the December 2023 gauging activities.
- Consistent with previous monitoring events conducted after remedy implementation, acenaphthene was detected above its Class GA groundwater quality criterion at wells MW-3 and MW-11S. Naphthalene was detected above its Class GA groundwater quality criterion in the sample from MW-3. The presence of these Site-related constituents is an expected result of the disturbance of the subsurface during implementation of the ISS. Overall, these concentrations have decreased since their post remediation peak and are anticipated to further decrease with time and will be evaluated during subsequent monitoring events.
- The concentrations of Site-related constituents detected in groundwater at the Site are not impacting surface water quality in the Patchogue River based on the mass flux evaluation of constituents in groundwater to the river.
- Increased pH levels in groundwater at two locations (MW-3 and MW-13S) immediately downgradient of the ISS mass are considered an effect from implementation of ISS in the area. The pH levels are anticipated to decrease to pre-remedy levels with time. The increased pH levels measured in groundwater at the Site are not impacting surface water quality in the Patchogue River based on the mass flux analysis conducted. pH levels in samples from MW-13 have been within the Class GA criterion range (6.5 to 8.5) for two of the last three monitoring events, including the December 2023 event.

Section 5

References

Brown and Caldwell Associates, February 2023, Site Management Plan, Patchogue Former MGP Site, Village of Patchogue, Suffolk County, New York, Site ID No. 1-52-182.

Brown and Caldwell Associates, February 2023, Final Engineering Report, Patchogue Former MGP Site, Village of Patchogue, Suffolk County, New York, Site ID No. 1-52-182.

Brown and Caldwell Associates, May 2019, Remedial Design Report (100% Submission), Patchogue Former MGP Site, Village of Patchogue, Suffolk County, New York, Site ID No. 1-52-182.

Brown and Caldwell Associates, December 2012, Construction Completion Report Utility Corridor Work Plan Implementation, Patchogue Former MGP Site, Village of Patchogue, Suffolk County, New York, Site ID No. 1-52-182.

EPA, July 1996; Revised September 2017. Low-Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells.

NYSDEC, CP-43: Groundwater Monitoring Well Decommissioning Policy, November 2009).

Tetra Tech EC, Inc, December 2009. Final Remedial Investigation Report for the Patchogue Former MGP Site, Patchogue, Suffolk County, New York.

Tables

TABLE 1
WATER ELEVATIONS AND NAPL MONITORING DATA
DECEMBER 2023 SEMI-ANNUAL GROUNDWATER MONITORING EVENT
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Location ID	Top of Casing Elevation (ft., NAVD)	12/13/2023			
		Depth to Water (ft., BTOC)	Water Elevation (ft., NAVD)	Depth to NAPL (ft., BTOC)	Total Depth of Well (ft., BTOC)
MW-1	11.47	5.51	5.96	NI	15.20
MW-3	5.56	1.50	4.06	NI	10.02
MW-4S	7.97	4.56	3.41	NI	12.26
MW-4D	7.79	4.33	3.46	NI	26.64
MW-7S	8.45	4.12	4.33	NI	12.36
MW-7D	8.31	3.98	4.33	NI	28.10
MW-8S	5.01	0.51	4.50	NI	9.83
MW-8D	4.99	0.42	4.57	NI	25.07
MW-10S	5.77	0.80	4.97	NI	15.51
MW-10D	5.73	0.76	4.97	NI	25.35
MW-11S	5.02	0.68	4.34	NI	13.75
MW-11D	5.14	0.73	4.41	NI	23.53
MW-12S	4.99	1.28	3.71	NI	13.80
MW-12D	4.92	1.17	3.75	NI	23.88
MW-13S	4.98	1.18	3.80	NI	13.28
MW-13D	4.96	1.17	3.79	NI	23.90
MW-14S	4.86	0.73	4.13	NI	12.60
MW-14D	4.82	0.76	4.06	NI	22.00
SG-1	5.38	3.84	1.54	NA	NA
SG-2	5.25	3.66	1.59	NA	NA

Notes:
NAVD - North American Vertical Datum 1988
ft. - Feet
BTOC - Below Top of Casing
NA - Not Applicable
NI - NAPL not Indicated by Oil/Water Interface Probe
-- - Not measured
MW - monitoring well
SG - staff gauge

TABLE 2
GROUNDWATER ANALYTICAL RESULTS
DECEMBER 2023 SEMI-ANNUAL GROUNDWATER MONITORING EVENT
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Constituent	Class GA Groundwater Criteria TOGS 1.1.1 Guidance	NYS Part 703 Standard	Units	Loc ID	MW-1	MW-3	MW-4S	MW-7S	MW-8S	MW-10S	MW-11S	MW-11S (Dup)	MW-12S	MW-12D	MW-13S	MW-13D	MW-14S
				Date	12/13/2023	12/13/2023	12/14/2023	12/14/2023	12/14/2023	12/14/2023	12/14/2023	12/14/2023	12/13/2023	12/13/2023	12/13/2023	12/13/2023	12/14/2023
Volatile Organic Compounds (VOCs)																	
Benzene	NE	1	µg/L		< 0.30 U	0.68 J	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	0.31 J	0.30 J	< 0.30 U	< 0.30 U	0.49 J	< 0.30 U	< 0.30 U
Toluene	NE	5	µg/L		< 0.30 U	0.62 J	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U	< 0.30 U
Ethylbenzene	NE	5	µg/L		< 0.40 U	2.1	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U
Xylenes, total	NE	5	µg/L		< 0.40 U	1.8	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	0.42 J	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U
Total BTEX[a]	NE	NE	µg/L		ND	5.2	ND	ND	ND	ND	0.31	0.72	ND	ND	0.49	ND	ND
Semi-Volatile Organic Compounds (SVOCs)																	
Polycyclic Aromatic Hydrocarbons (PAHs)																	
Acenaphthene	20	NE	µg/L		< 0.014 U	**33**	18	< 0.072 UJ	0.23	< 0.050 UJ	**34**	**30**	0.017 J	< 0.014 U	5.5	< 0.014 U	0.25
Acenaphthylene	NE	NE	µg/L		< 0.015 U	2.5	0.27	< 0.015 U	< 0.015 U	< 0.015 U	0.49	0.47	< 0.015 U	< 0.015 U	0.20	< 0.015 U	< 0.015 U
Anthracene	50	NE	µg/L		< 0.025 U	1.7	0.21	0.050	< 0.025 U	< 0.025 U	3.1 J	1.5 J	< 0.025 U	< 0.025 U	0.51	< 0.025 U	< 0.025 U
Benzo(a)anthracene	0.002	NE	µg/L		**0.019** J	**0.24**	< 0.016 U	< 0.016 U	< 0.016 U	< 0.016 U	**0.27**	**0.22**	< 0.016 U	< 0.016 U	**0.16**	< 0.016 U	< 0.016 U
Benzo(a)pyrene	NE	0	µg/L		< 0.022 U	< 0.022 U	< 0.022 U	< 0.022 U	< 0.022 U	< 0.022 U	0.13 J	0.10 J	< 0.022 U	< 0.022 U	< 0.022 U	< 0.022 U	< 0.022 U
Benzo(b)fluoranthene	0.002	NE	µg/L		< 0.024 U	< 0.024 U	< 0.024 U	< 0.024 U	< 0.024 U	< 0.024 U	**0.20**	**0.14**	< 0.024 U	< 0.024 U	< 0.024 U	< 0.024 U	< 0.024 U
Benzo(g,h,i)perylene	NE	NE	µg/L		< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	0.080	0.069	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U
Benzo(k)fluoranthene	0.002	NE	µg/L		< 0.028 U	< 0.028 U	< 0.028 U	< 0.028 U	< 0.028 U	< 0.028 U	**0.054**	**0.059**	< 0.028 U	< 0.028 U	< 0.028 U	< 0.028 U	< 0.028 U
Chrysene	0.002	NE	µg/L		< 0.030 U	**0.13**	< 0.030 U	< 0.030 U	< 0.030 U	< 0.030 U	**0.29**	**0.23**	< 0.030 U	< 0.030 U	**0.11**	< 0.030 U	< 0.030 U
Dibenz(a,h)anthracene	NE	NE	µg/L		0.021 J	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U	< 0.020 U
Fluoranthene	50	NE	µg/L		< 0.039 U	8.3	3.1	< 0.039 U	< 0.039 U	< 0.039 U	3.0	2.7	< 0.039 U	< 0.039 U	1.4	< 0.039 U	< 0.039 U
Fluorene	50	NE	µg/L		0.016 J	7.9	3.7	< 0.050 UJ	< 0.050 UJ	< 0.012 U	7.6 J	3.5 J	< 0.012 U	< 0.012 U	2.1	< 0.012 U	< 0.050 UJ
Indeno(1,2,3-c,d)pyrene	0.002	NE	µg/L		< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	**0.099**	**0.083**	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U
Naphthalene	10	NE	µg/L		< 0.12 U	**54**	0.21	< 0.12 U	< 0.12 U	< 0.12 U	2.4 J	0.28 J	< 0.12 U	< 0.12 U	0.19 J	< 0.12 U	0.40
Phenanthrene	50	NE	µg/L		0.030 J	14	< 0.063 UJ	< 0.050 UJ	< 0.022 UJ	< 0.022 UJ	12 J	0.27 J	< 0.022 U	< 0.022 U	1.3	< 0.022 U	< 0.022 UJ
Pyrene	50	NE	µg/L		< 0.031 U	8.2	3.9	< 0.031 U	< 0.031 U	< 0.031 U	3.8	3.4	< 0.031 U	< 0.031 U	1.6	< 0.031 U	< 0.031 U
Total PAHs[b]	NE	NE	µg/L		0.086	129.97	29.39	0.05	0.23	ND	67.513	43.021	0.017	ND	13.07	ND	0.65

Notes:
BTEX - benzene, toluene, ethylbenzene and isomers of xylene.
TOGS - Technical and Operational Guidance Series
U - The analyte was analyzed for, but was not detected above the sample reporting limit. Value shown is representative of method detection limit for the analyzed constituent.
J - Estimated concentration. The result is below the reporting limit but above the method detection limit.
µg/L - micrograms per liter
ND - Not detected.
NE - Not established.
(a) - To calculate total BTEX concentration, a value of zero is used for non-detect values.
(b) - To calculate total PAH concentration, a value of zero is used for non-detect values.

Boxed concentrations in bold font are above New York State Class GA Groundwater Quality Criteria (Standards or Guidance values).

TABLE 3
SUMMARY OF HISTORICAL BTEX CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total BTEX Concentrations (µg/L) [a]													
	Monitoring Well													
	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	MW-5	MW-6	MW-7S	MW-7D	MW-8S	MW-8D	MW-9S	MW-9D
Mar-08	0	0	0	0	3.4	0	1016	57	NS	NS	NS	NS	NS	NS
Jul-08	NS	0	0	0	0	0	678	0	0	0	0	0	0	0
Mar-09	0	0	0	0	0	0	975	0	0	1	0	0	0	0
Sep-09	0	0	0	0	0	0	1257	1	0	0	0	0	0	0
Mar-10	0	0	0	0	0	0	637	2	0	9	0	0	0	0
Sep-10	0	0	0	0	0	0	NS	0	0	0	0	0	27	0
Jan-11	1.7	0	0	0	0	0	NS	NS	0	0	0	0	1	0
Apr-11	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0
Aug-11	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0
Nov-11	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0
Feb-12	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0
May-12	0	0	0	0	0	0	NS	NS	0	0	0	0	0	0
Nov-12	0	-- [b]	-- [a]	0	12	0	NS	NS	1	0	0	0	NS	NS
Jun-13	0	-- [b]	-- [b]	0	0.8	0	NS	NS	0.7	0	0	0	0	NS
Dec-13	0	-- [b]	-- [b]	NS	0	0	NS	NS	0.8	0	0	0	NS	NS
Jun-14	0	-- [b]	-- [b]	0	0	0	NS	NS	0.8	0	0	0	NS	NS
Dec-14	0	-- [b]	-- [b]	0	0	0	NS	NS	1.3	0	0	0	0	0
Jun-15	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0
Dec-15	0	-- [b]	-- [b]	0	0	0	NS	NS	0.5	0	0	0	0	0
Jun-16	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0
Dec-16	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0
Jun-17	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0
Dec-17	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0
Jun-18	0	-- [b]	-- [b]	0	0	0	NS	0	0	0	0	0	0	0
Dec-18	0	-- [b]	-- [b]	0	0	0	NS	NS	0	0	0	0	0	0
Mar-20	0	-- [b]	-- [b]	35	4.3	0	-- [c]	-- [c]	0.4	0	0	0	-- [c]	-- [c]
Jun-20	0	-- [b]	-- [b]	18	2	0	-- [c]	-- [c]	0	0	0	0	-- [c]	-- [c]
Sep-20	0	-- [b]	-- [b]	20	2	0	-- [c]	-- [c]	0.4	0	0	0	-- [c]	-- [c]
Dec-20	0	-- [b]	-- [b]	19	1	0	-- [c]	-- [c]	0	0	0	0	-- [c]	-- [c]

TABLE 3
SUMMARY OF HISTORICAL BTEX CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total BTEX Concentrations (µg/L) [a]													
	Monitoring Well													
	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	MW-5	MW-6	MW-7S	MW-7D	MW-8S	MW-8D	MW-9S	MW-9D
Mar-21	0	-- [b]	-- [b]	10.2	0.6	0	-- [c]	-- [c]	0.3	0	0	0	-- [c]	-- [c]
Jun-21	0	-- [b]	-- [b]	8.4	0.7	0	-- [c]	-- [c]	0.34	0	0	0	-- [c]	-- [c]
Sep-21	0	-- [b]	-- [b]	8.7	1.0	0	-- [c]	-- [c]	0	0	0	0	-- [c]	-- [c]
Dec-21	0	-- [b]	-- [b]	12	0.3	0	-- [c]	-- [c]	0.31	0	0	0	-- [c]	-- [c]
Jun-22	0	-- [b]	-- [b]	3.9	0	NS[d]	-- [c]	-- [c]	0.31	NS[d]	0	NS[d]	-- [c]	-- [c]
Dec-22	0	-- [b]	-- [b]	4.7	0	NS[d]	-- [c]	-- [c]	0	NS[d]	0	NS[d]	-- [c]	-- [c]
Jun-23	0	-- [b]	-- [b]	3.3	0	NS[d]	-- [c]	-- [c]	0	NS[d]	0	NS[d]	-- [c]	-- [c]
Dec-23	0	-- [b]	-- [b]	5.2	0	NS[d]	-- [c]	-- [c]	0	NS[d]	0	NS[d]	-- [c]	-- [c]
Minimum	0	0	0	0	0	0	637	0	0	0	0	0	0	0
Maximum	1.7	0	0	35	12	0	1257	57	1.3	9.0	0	0	27	0
Mean	0.0	0	0	4.1	0.8	0	913	8.6	0.20	0.3	0	0	1.3	0

Notes:
BTEX - Benzene, toluene, ethylbenzene and isomers of xylene
µg/L - micrograms per liter
NS - Not sampled.
NI - Monitoring well or piezometer not installed at time of sampling.
(a) - To calculate total BTEX concentration, a value of zero is used for non-detect values.
(b) - Monitoring well was decommissioned on 6/4/12 as part of the Utility Corridor Construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (BC, December 2012).
(c) - Monitoring well/piezometer was decommissioned on 6/13/19 as part of pre-remedial construction activities in accordance with the "Remedial Design Report (100% Submittal)" (BC, May 2019) and "CP-43: Groundwater Monitoring Well Decommissioning Policy" (NYSDEC, November 2009).
(d) - As approved by NYSDEC in an e-mail dated April 13, 2022, sampling of monitoring well is no longer required.

TABLE 3
SUMMARY OF HISTORICAL BTEX CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total BTEX Concentrations (µg/L) [a]										
	Monitoring Well/Piezometer										
	MW-10S	MW-10D	MW-11S	MW-11D	MW-12S	MW-12D	MW-13S	MW-13D	MW-14S	MW-14D	PZ-4A
Mar-08	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-08	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mar-09	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-09	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mar-10	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-10	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jan-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Apr-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Aug-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Feb-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-13	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-13	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-14	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0
Dec-14	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-15	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-15	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-16	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-16	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-17	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-17	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-18	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-18	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Mar-20	0	0	4	0	0	0	37	0	0	0	-- [c]
Jun-20	0	0	2.7	0	0	0	25	0	0.73	0	-- [c]
Sep-20	0	0	1.9	0	0	0	26	0	0	0	-- [c]
Dec-20	0	0	0	0	0	0	6.9	0	0	0	-- [c]

TABLE 3
SUMMARY OF HISTORICAL BTEX CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total BTEX Concentrations (µg/L) [a]										
	Monitoring Well/Piezometer										
	MW-10S	MW-10D	MW-11S	MW-11D	MW-12S	MW-12D	MW-13S	MW-13D	MW-14S	MW-14D	PZ-4A
Mar-21	0	0	1.3	0	0	0	4	0	0	0	-- [c]
Jun-21	0.22	0	1.6	0	0	0	5.3	0	0	0	-- [c]
Sep-21	0	0	0	0	0	0	3.9	0	0	0	-- [c]
Dec-21	0	0	1.9	0	0	0	0	0	0	0	-- [c]
Jun-22	0	NS[d]	1.8	NS[d]	0	0	3.7	0	0	NS[d]	-- [c]
Dec-22	0	NS[d]	2.1	NS[d]	0	0	0.96	0	0	NS[d]	-- [c]
Jun-23	0	NS[d]	1.4	NS[d]	0	0	2.7	0	0	NS[d]	-- [c]
Dec-23	0	NS[d]	0.72	NS[d]	0	0	0.49	0	0	NS[d]	-- [c]
Minimum	0	0	0	0	0	0	0	0	0	0	0
Maximum	0.22	0	4.0	0	0	0	37	0	0.73	0	0
Mean	0.02	0	1.6	0	0	0	10	0	0.1	0	0

Notes:
BTEX - Benzene, toluene, ethylbenzene and isomers of xylene
µg/L - micrograms per liter
NS - Not sampled.
NI - Monitoring well or piezometer not installed at time of sampling.
(a) - To calculate total BTEX concentration, a value of zero is used for non-detect values.
(b) - Monitoring well was decommissioned on 6/4/12 as part of the Utility Corridor Construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (BC, December 2012).
(c) - Monitoring well/piezometer was decommissioned on 6/13/19 as part of pre-remedial construction activities in accordance with the "Remedial Design Report (100% Submittal)" (BC, May 2019) and "CP-43: Groundwater Monitoring Well Decommissioning Policy" (NYSDEC, November 2009).
(d) - As approved by NYSDEC in an e-mail dated April 13, 2022, sampling of monitoring well is no longer required.

TABLE 4
SUMMARY OF HISTORICAL PAH CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total PAH Concentrations (µg/L) [a]													
	Monitoring Well													
	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	MW-5	MW-6	MW-7S	MW-7D	MW-8S	MW-8D	MW-9S	MW-9D
Mar-08	0	0	0	0.76	0.6	4.3	1774	214	NS	NS	NS	NS	NS	NS
Jul-08	NS	0.7	0	0	8	0	1799	154	0	0.47	0	0	12	0
Mar-09	0	0	0	0	0	0	2730	0	0	0	0	0	0	0
Sep-09	0	0	0	0	0	0	3373	1	0	0	0	0	0	0
Mar-10	0	0	0	0	0	39	2390	17	0	0	22	0	2	0
Sep-10	0	0	0	128	0	6	NS	14	0	0	11	0	396	0
Jan-11	22	0	0	17	0	12	NS	NS	0	0	6	0	42	5
Apr-11	0	0	0	6	0	20	NS	NS	0	0	0	0	9	0
Aug-11	0	0	0.1	14	0.1	0	NS	NS	0	0	0.4	0	16	1.2
Nov-11	0	0	0.2	10	0.4	0	NS	NS	0	0	0.8	0.2	8	3.4
Feb-12	0.2	0	0	6	0.6	4	NS	NS	0.1	0	0.6	0	5	2.9
May-12	0.4	0.1	0.6	5	0	5.8	NS	NS	0.1	0.3	1	0	6	2.8
Nov-12	0.1	-- [b]	-- [b]	5.6	0.4	11.7	NS	NS	2.5	2.6	0.8	1.2	NS	NS
Jun-13	0.8	-- [b]	-- [b]	NS	0.3	3.7	NS	NS	1.3	0.4	0.4	0.6	2	NS
Dec-13	0	-- [b]	-- [b]	NS	0	2.5	NS	NS	0.8	0.4	0.3	0	NS	NS
Jun-14	0	-- [b]	-- [b]	2.2	0.9	0	NS	NS	0.8	0.3	0.2	0	NS	NS
Dec-14	0.1	-- [b]	-- [b]	1.2	0.4	0	NS	NS	3	0	0.1	0	21	0.3
Jun-15	0	-- [b]	-- [b]	1.1	0.9	0	NS	NS	0.9	0	0.3	0	10	0.3
Dec-15	0	-- [b]	-- [b]	0	0	0	NS	NS	0.9	0	0	0	3.9	0
Jun-16	0	-- [b]	-- [b]	1.9	0.8	0	NS	NS	2.5	0	0	0	5.9	0
Dec-16	0	-- [b]	-- [b]	0.02	0	0.1	NS	NS	0	0	0	0	5.5	0.07
Jun-17	0	-- [b]	-- [b]	2.0	0.5	0	NS	NS	1	0	0	0	3.2	0
Dec-17	0	-- [b]	-- [b]	0.53	0	0.031	NS	NS	0	0.11	0	0.017	6.0	0.14
Jun-18	0	-- [b]	-- [b]	3.1	1.1	0.010	NS	53	0.02	0.01	0.08	0.09	7.4	0.55
Dec-18	0.31	-- [b]	-- [b]	1.5	1.2	0.080	NS	NS	0.08	0.05	0.10	0.13	7.9	1.0
Mar-20	0	-- [b]	-- [b]	20	17	0.21	-- [c]	-- [c]	0.32	0	0.09	0	-- [c]	-- [c]
Jun-20	0	-- [b]	-- [b]	179	37	0	-- [c]	-- [c]	0.14	0	0.11	0	-- [c]	-- [c]
Sep-20	0	-- [b]	-- [b]	336	41	0	-- [c]	-- [c]	0	0	0.21	0	-- [c]	-- [c]
Dec-20	0	-- [b]	-- [b]	333	33	0	-- [c]	-- [c]	0	0	0.14	0	-- [c]	-- [c]

TABLE 4
SUMMARY OF HISTORICAL PAH CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total PAH Concentrations (µg/L) [a]													
	Monitoring Well													
	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	MW-5	MW-6	MW-7S	MW-7D	MW-8S	MW-8D	MW-9S	MW-9D
Mar-21	0	-- [b]	-- [b]	172	24	0	-- [c]	-- [c]	0.26	0	0.11	0.043	-- [c]	-- [c]
Jun-21	0	-- [b]	-- [b]	177	68	0	-- [c]	-- [c]	0.18	0	0.20	0	-- [c]	-- [c]
Sep-21	0.1	-- [b]	-- [b]	223	16	0	-- [c]	-- [c]	0.07	0	0.18	0.111	-- [c]	-- [c]
Dec-21	0.011	-- [b]	-- [b]	234	40	0.011	-- [c]	-- [c]	0.140	0.039	0.512	0.219	-- [c]	-- [c]
Jun-22	0.011	-- [b]	-- [b]	177	49	NS [d]	-- [c]	-- [c]	1.3	NS [d]	0.61	NS [d]	-- [c]	-- [c]
Dec-22	0	-- [b]	-- [b]	148	39	NS [d]	-- [c]	-- [c]	0.15	NS [d]	0.36	NS [d]	-- [c]	-- [c]
Jun-23	0.104	-- [b]	-- [b]	143	4	NS [d]	-- [c]	-- [c]	0.23	NS [d]	0.23	NS [d]	-- [c]	-- [c]
Dec-23	0.086	-- [b]	-- [b]	130	29	NS [d]	-- [c]	-- [c]	0.05	NS [d]	0.23	NS [d]	-- [c]	-- [c]
Min	0	0	0	0	0	0	1774	0	0	0	0	0	0	0
Max	22	0.7	0.6	336	68	39	3373	214	3.0	2.6	22	1.2	396	5
Mean	0.7	0.067	0.1	71	11	3.3	2413	65	0.47	0.15	1.3	0.082	27	0.88

Notes:
PAH - Polycyclic aromatic hydrocarbons
µg/L - micrograms per liter
NS - Not sampled.
NI - Monitoring Well or piezometer not installed at time of sampling.
(a) - To calculate total PAH concentration, a value of zero is used for non-detect values.
(b) - Monitoring well was decommissioned on 6/4/12 as part of the Utility Corridor Construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (Brown and Caldwell, December 2012).
(c) - Monitoring well/piezometer was decommissioned on 6/13/19 as part of pre-remedial construction activities in accordance with the "Remedial Design Report (100% Submittal)" (BC, May 2019) and "CP-43: Groundwater Monitoring Well Decommissioning Policy" (NYSDEC, November 2009).
(d) - As approved by NYSDEC in an e-mail dated April 13, 2022, sampling of monitoring well is no longer required.

TABLE 4
SUMMARY OF HISTORICAL PAH CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

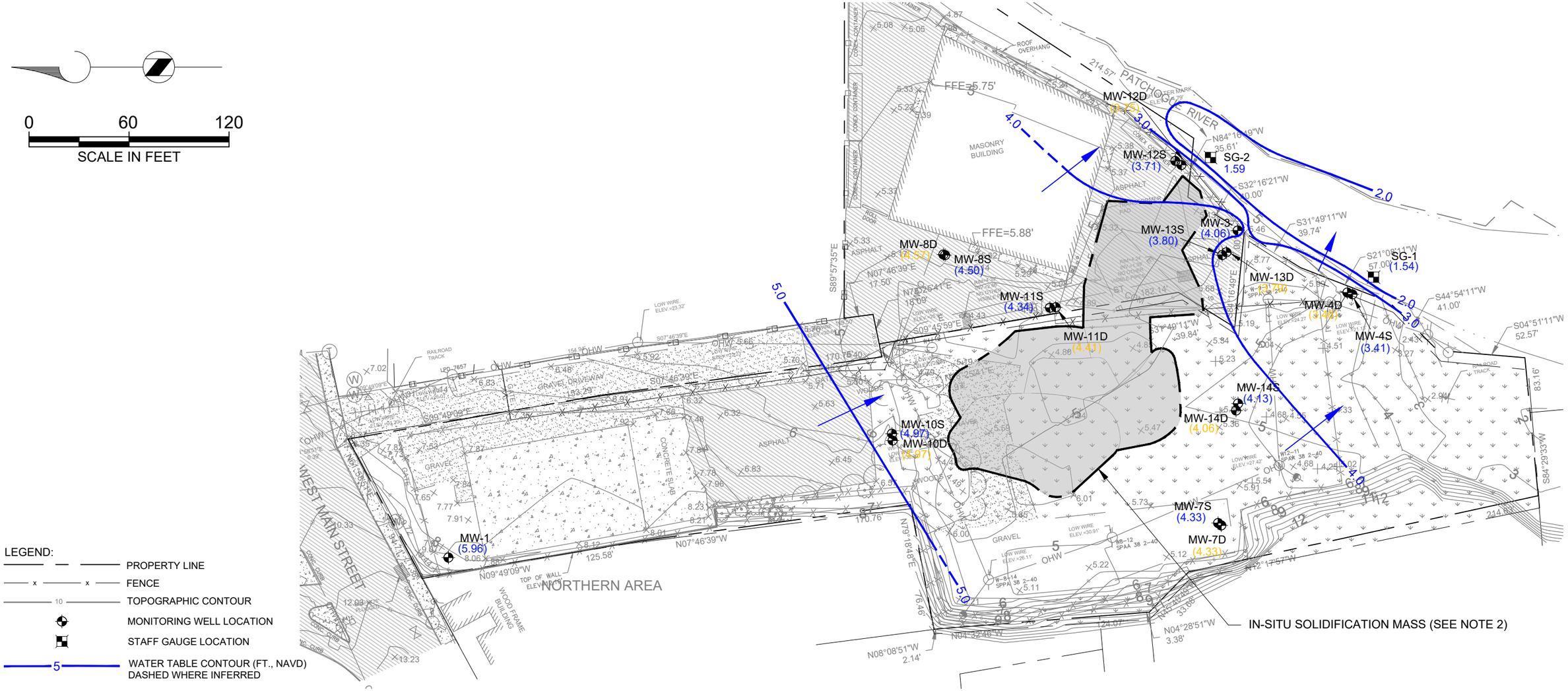
Sampling Date	Total PAH Concentrations (µg/L) [a]										
	Monitoring Well/Piezometer										
	MW-10S	MW-10D	MW-11S	MW-11D	MW-12S	MW-12D	MW-13S	MW-13D	MW-14S	MW-14D	PZ-4A
Mar-08	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-08	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mar-09	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-09	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mar-10	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-10	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jan-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Apr-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Aug-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-11	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Feb-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-13	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-13	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-14	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	0.3
Dec-14	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-15	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-15	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-16	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-16	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-17	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-17	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Jun-18	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Dec-18	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS
Mar-20	0.3	0.3	96	1.5	14	0	188	0.1	0.5	0.04	-- [c]
Jun-20	0	0	63	0	0	0	394	0.11	1.8	0	-- [c]
Sep-20	0	0	127	0	0	0	467	0	0.12	0	-- [c]
Dec-20	0	0	6.8	0	0.17	0	182	0	1.7	0	-- [c]

TABLE 4
SUMMARY OF HISTORICAL PAH CONCENTRATIONS
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Sampling Date	Total PAH Concentrations (µg/L) [a]										
	Monitoring Well/Piezometer										
	MW-10S	MW-10D	MW-11S	MW-11D	MW-12S	MW-12D	MW-13S	MW-13D	MW-14S	MW-14D	PZ-4A
Mar-21	0	0	78	0	0.012	0	187	0.037	1.0	0	-- [c]
Jun-21	0.016	0.036	79	0.15	0	0	284	0.042	0.055	0.047	-- [c]
Sep-21	0.122	0.052	2	0	0	0	140	0.046	0.277	0	-- [c]
Dec-21	0.127	0	63	0.033	0.010	0.011	37	0.046	0.244	0.297	-- [c]
Jun-22	0.010	NS[d]	87	NS[d]	0.185	0.281	68	0.024	1.29	NS[d]	-- [c]
Dec-22	0	NS[d]	108	NS[d]	0.014	0	10	0.304	0.15	NS[d]	-- [c]
Jun-23	0	NS[d]	34	NS[d]	0.42	0.072	1.9	0.071	0.77	NS[d]	-- [c]
Dec-23	0	NS[d]	68	NS[d]	0.02	0	13.1	0	0.65	NS[d]	-- [c]
Min	0	0	2.0	0	0	0	1.9	0	0.055	0	0.3
Max	0.3	0.3	127	1.5	14	0.281	467	0.30	1.8	0.297	0.3
Mean	0.056	0.049	68	0.21	1.2	0.030	164	0.065	0.73	0.048	0.3

Notes:
PAH - Polycyclic aromatic hydrocarbons
µg/L - micrograms per liter
NS - Not sampled.
NI - Monitoring well or piezometer not installed at time of sampling.
(a) - To calculate total PAH concentration, a value of zero is used for non-detect values.
(b) - Monitoring well was decommissioned on 6/4/12 as part of the Utility Corridor Construction activities. See "Construction Completion Report, Utility Corridor Work Plan Implementation" (Brown and Caldwell, December 2012).
(c) - Monitoring well/piezometer was decommissioned on 6/13/19 as part of pre-remedial construction activities in accordance with the "Remedial Design Report (100% Submittal)" (BC, May 2019) and "CP-43: Groundwater Monitoring Well Decommissioning Policy" (NYSDEC, November 2009).
(d) - As approved by NYSDEC in an e-mail dated April 13, 2022, sampling of monitoring well is no longer required.

Figures



LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAUGE LOCATION
- 5 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- (4.97) — GROUNDWATER ELEVATION (FT., NAVD) FROM SHALLOW MONITORING WELL (SCREENED ACROSS OR CLOSE TO WATER TABLE) OR RIVER LEVEL FROM STAFF GAUGE (FT., NAVD).
- (4.57) — GROUNDWATER ELEVATION (FT., NAVD) FROM DEEP MONITORING WELL (SCREENED BELOW WATER TABLE). VALUE NOT USED FOR CONTOURING.
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

NOTES:

1. BASE MAP DEVELOPED BASED ON DRAWING PREPARED BY MJ ENGINEERING AND LAND SURVEYING, P.C. DATED NOVEMBER 30, 2017.
2. TOP OF ISS MASS IS POSITIONED APPROXIMATELY 4 FEET BELOW GRADE.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: February 14, 2024

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

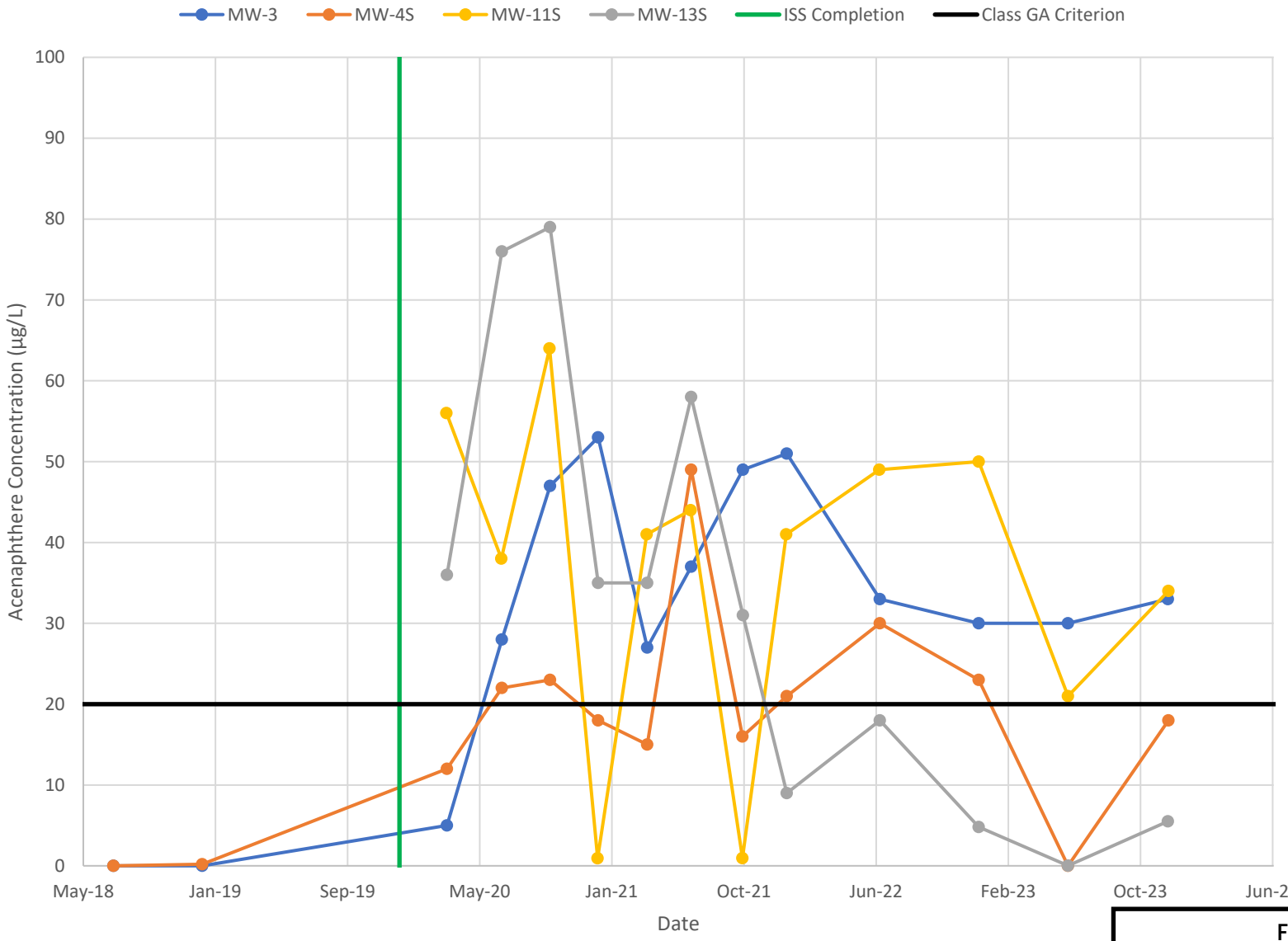
WATER TABLE ELEVATION CONTOUR MAP
DECEMBER 13, 2023

FIGURE

1

Path: C:\bcpw\d2439856 File Name: 153021 Water Table December 2023 Plot Date: February 14, 2024 8:41 AM Cadd User: Alan Santiago

153021



Notes:
ISS = In-Situ Solidification
TOGS 1.1.1 Guidance Value = 20 µg/L

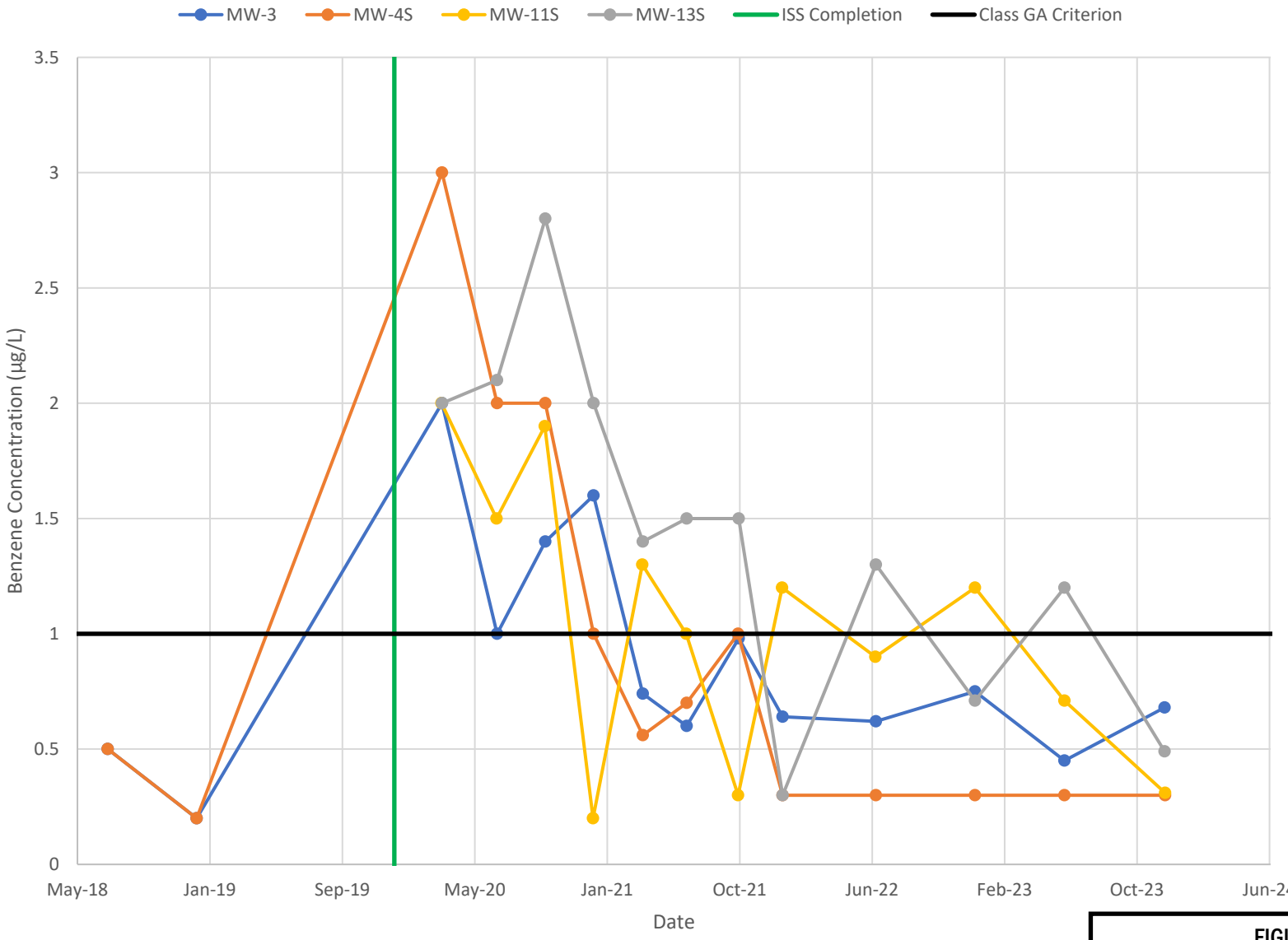
FIGURE 2

GROUNDWATER QUALITY TREND PLOT - ACENAPHTHENE

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Brown AND Caldwell

153021



Notes:
ISS = In-Situ Solidification
NYS Part 703 Class GA Standard = 1 µg/L

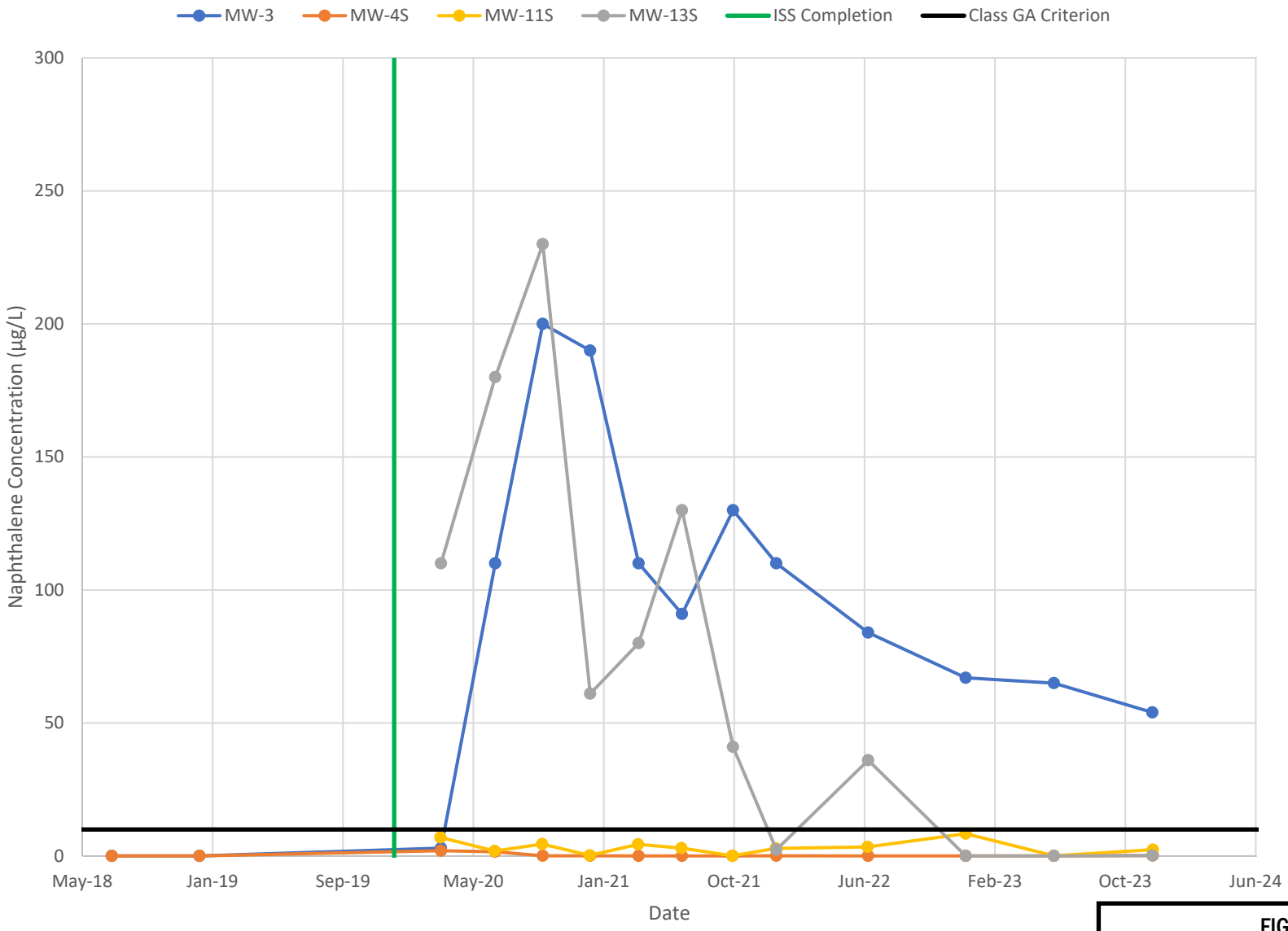
FIGURE 3

GROUNDWATER QUALITY TREND PLOT - BENZENE

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Brown AND Caldwell

153021



Notes:
ISS = In-Situ Solidification
TOGS 1.1.1 Guidance Value = 10 µg/L

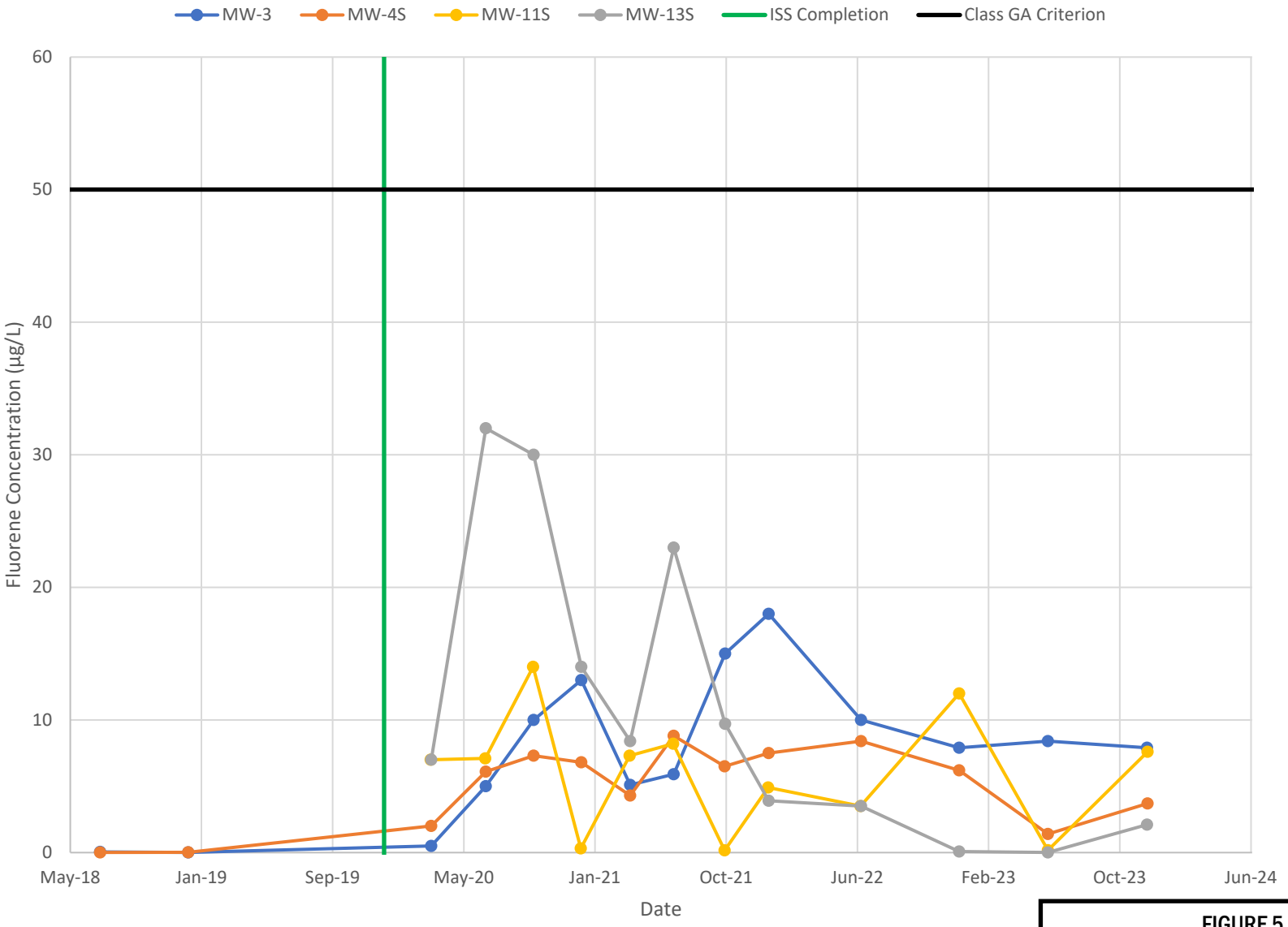
FIGURE 4

GROUNDWATER QUALITY TREND PLOT – NAPHTHALENE

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Brown AND Caldwell

153021



Notes:
ISS = In-Situ Solidification
TOGS 1.1.1 Guidance Value = 50 µg/L

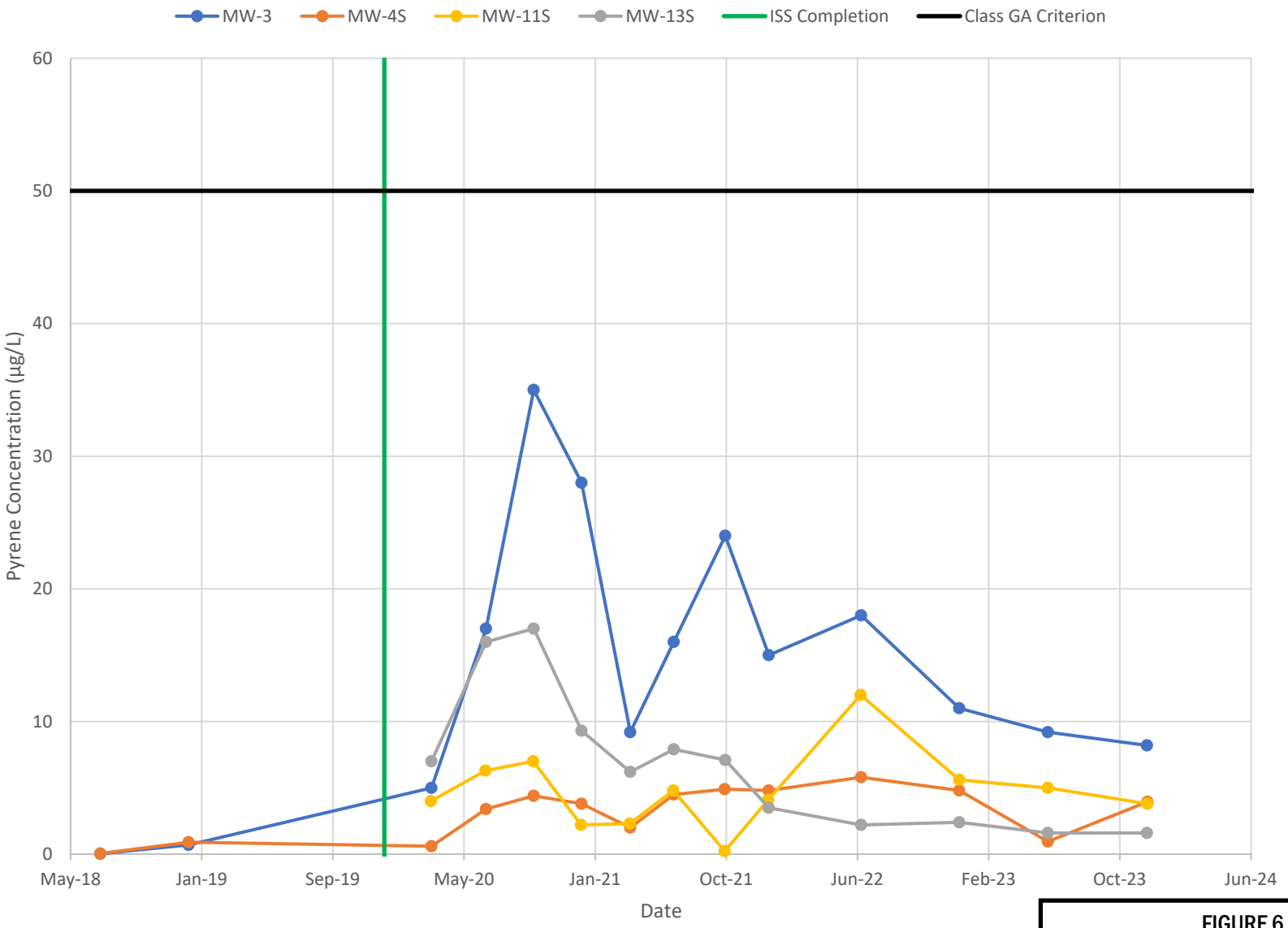
FIGURE 5

GROUNDWATER QUALITY TREND PLOT – FLUORENE

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Brown AND Caldwell

153021



Notes:
ISS = In-Situ Solidification
TOGS 1.1.1 Guidance Value = 50 µg/L

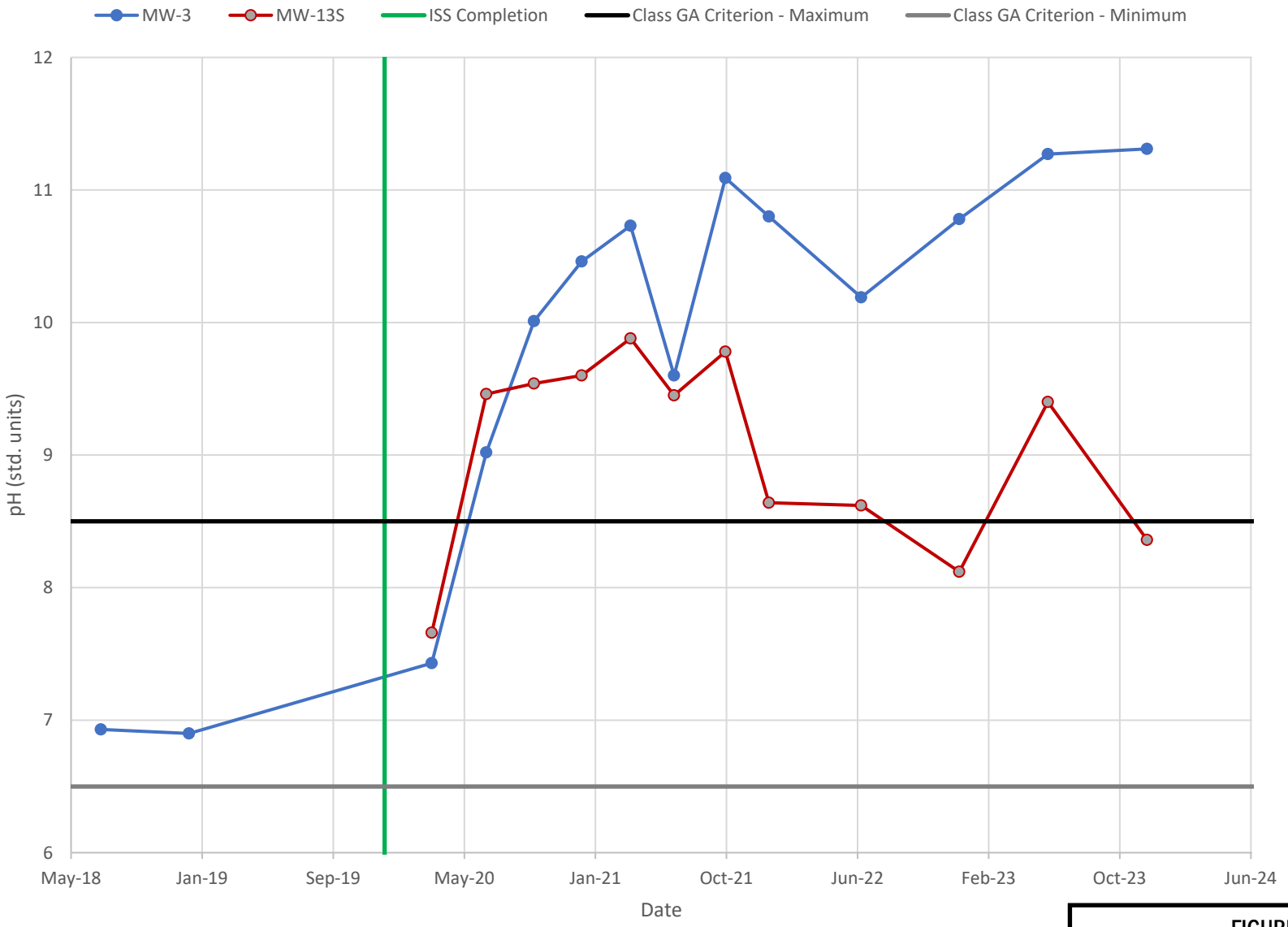
FIGURE 6

GROUNDWATER QUALITY TREND PLOT – PYRENE

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Brown AND Caldwell

153021



Notes:
ISS = In-Situ Solidification
NYS Part 703 Class GA Standard (Minimum) = 6.5
NYS Part 703 Class GA Standard (Maximum) = 8.5

FIGURE 7

GROUNDWATER QUALITY TREND PLOT – pH

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Brown AND Caldwell

Appendix A: Field Sampling Data Sheets

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JC / MHM
Purge/Sample Depth: 7-10'

Project Number:
Date: 12/13/23
Well ID: MW-1
Sample ID: MW-1-20231213

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
0948	6.15	13.59	0.783	3.21	20.2	-63	5.74	300	
0951	6.22	14.00	0.784	2.64	19.2	-71	5.70		
0954	6.36	14.22	0.781	2.30	15.5	-80	5.68		
0957	6.44	14.34	0.777	2.44	13.9	-83	5.69		
1000	6.46	14.57	0.764	2.37	13.6	-89	5.67		
1003	6.52	14.74	0.752	2.27	11.5	-89	5.66		
1006	6.42	14.75	0.748	2.15	10.7	-88	5.66		
1009	6.47	14.7	0.746	2.28	9.8	-92	5.66		
1012	6.45	14.89	0.743	2.16	8.6	-94	5.65		
1015	6.51	14.89	0.742	2.28	7.6	-97	5.65		
1018	6.52	14.89	0.743	2.38	6.9	-96	5.65	↓	
1021	collect	MW-1	-20231213						

12/13/23

Certified Sample Information:
Time of Sample: 1021
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: LOP ARZRV
Serial No. Handheld: SI-J480MS
Calibration Date/Time: 12/13/23 0940

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-1
Sample I.D.: MW-1-20231213

Project: Parchoyue
Personnel: JL / MH / MM

Date: 12/13/23 Time: 0948
Weather: Sunny Air Temp.: 45°F

WELL DATA:

Casing Diameter: 4" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 5.51 ft Bottom of Well: 15.20 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☑ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 300 mL/min Elapsed Time: 30 min Volume Pumped: 3 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☑ Prepared Off-Site ☐ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☑ Prepared Off-Site ☐ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/13/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JC / MH / HM
Purge/Sample Depth: ~7.5'

Project Number:
Date: 12/13/23
Well ID: MW-3
Sample ID: MW-3 - 20231213

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1058	9.01	13.05	0.558	2.83	4.4	-208	1.69	300	
1101	10.07	13.43	0.608	2.22	3.5	-256	1.72		
1104	10.89	13.53	0.733	1.71	3.0	-268	1.75		
1107	11.11	13.57	0.786	1.57	3.2	-277	1.80		
1110	11.19	13.59	0.799	1.43	2.6	-276	1.69		
1113	11.25	13.67	0.833	1.35	2.3	-284	1.75		
1116	11.26	13.68	0.841	1.30	2.1	-286	1.76		
1119	11.29	13.62	0.850	1.24	2.0	-289	1.80		
1122	11.27	13.65	0.856	1.22	2.1	-289	1.75		
1125	11.29	13.68	0.849	1.24	2.2	-281	1.69		
1128	11.31	13.66	0.857	2.49	1.6	-292	1.70	↓	
1131	Collect MW-3 -20231213								

12/13/23

Certified Sample Information:
Time of Sample: 1131
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: LOP AR2 RV
Serial No. Handheld: SFJ480MS
Calibration Date/Time: 12/13/23 0940

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: ~~MW-03~~ MW-03 (J.L)
Sample I.D.: MW-03-20131213

Project: Parkway
Personnel: JC / MM

Date: 12/13/13 Time: 1058
Weather: Sunny Air Temp.: 45°F

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 1.50 ft Bottom of Well: 10.02 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☑ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 300 mL/min Elapsed Time: 30 min Volume Pumped: 3 gal.
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☑ Prepared Off-Site ☐ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☑ Prepared Off-Site ☐ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☐ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/13/13

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JC / MHM
Purge/Sample Depth: ~10'

Project Number:
Date: 12/13/23
Well ID: MW-13S
Sample ID: MW-13S - 20231213

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1226	9.07	12.88	0.747	6.95	9.3	-287	1.20	200	
1229	8.73	13.23	0.732	10.31	7.0	-304	1.21		
1232	8.59	13.38	0.720	11.14	7.8	-311	1.24		
1235	8.50	13.45	0.710	11.01	8.1	-319	1.25		
1238	8.44	13.46	0.702	10.63	5.5	-327	1.25		
1241	8.45	13.49	0.697	10.63	5.3	-332	1.26		
1244	8.41	13.51	0.696	11.03	4.7	-332	1.26		
1247	8.41	13.52	0.692	10.31	4.9	-335	1.25		
1250	8.40	13.54	0.692	10.29	4.9	-333	1.26		
1253	8.38	13.57	0.692	10.11	4.6	-335	1.25		
1256	8.36	13.56	0.693	10.13	4.6	-334	1.25		
1259	Collect MW-13S - 20231213								
			JC						
						12/13/23			

Certified Sample Information:
Time of Sample: 1259
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 20P ARZRV
Serial No. Handheld: SFJ480MS
Calibration Date/Time: 12/13/23 0940

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-13S
Sample I.D.: MW-13S-20231213

Project: Pathmark
Personnel: JC/MHM

Date: 12/13/23 Time: 1226
Weather: sunny Air Temp.: 47°F

WELL DATA:

Casing Diameter: ~~6~~ 2" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 1.18 ft Bottom of Well: 13.28 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
(Tubing/Rope): ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 200 ml/min Elapsed Time: 30 min Volume Pumped: 2 gal.
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: —
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☒ Stainless Steel
(Tubing/Rope): ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: _____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☒ No ☐ Yes Name: _____
MS/MSD : ☒ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/13/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JC / MHM
Purge/Sample Depth:

Project Number:
Date: 12/13/23
Well ID: MW-13D
Sample ID: MW-13D-20231213

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1311	7.46	12.65	0.447	5.81	5.9	55	1.20	200	
1314	6.51	12.93	0.437	1.85	4.3	130	1.24	↓	
1317	6.30	12.97	0.435	1.46	3.6	140	1.24		
1320	6.07	13.04	0.434	1.05	8.1	153	1.21		
1323	5.84	13.12	0.433	0.75	11.8	165	1.20		
1326	5.78	13.19	0.433	0.61	9.0	171	1.20		
1329	5.70	13.20	0.433	0.53	8.1	180	1.21		
1332	5.66	13.22	0.433	0.45	10.1	183	1.25		
1335	5.62	13.23	0.433	0.37	9.0	189	1.24		
1338	5.58	13.25	0.432	0.34	5.0	196	1.21		
1341	5.58	13.23	0.432	0.34	10.0	197	1.20	↓	
1344	Collect MW-13D-20231213								

12/13/23

Certified Sample Information:
Time of Sample: 1344
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 10PAR2RV
Serial No. Handheld: 51J480MS
Calibration Date/Time: 12/13/23 0940

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-13D
Sample I.D.: MW-13D-20231213

Project: Parthogue
Personnel: JC/MH/FM

Date: 12/13/23 Time: 1311
Weather: Sunny Air Temp.: 45°F

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☒ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 1.17 ft Bottom of Well: 23.90 ft
DATUM: ☐ Top of Protective Casing ☒ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☒ Yes ☐ No Is well clean to bottom? ☒ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☒ Yes ☐ No
Does Weep Hole adequately drain well head? ☐ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☒ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☒ NA Is Inner Casing Intact? ☒ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☒ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☒ Stainless Steel ☐ PVC ☐ Other: _____
(Tubing/Rope): ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 200 ml/min Elapsed Time: 30 min Volume Pumped: 2 gal.
Was well Evacuated? ☐ Yes ☒ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☒ Teflon® ☒ Stainless Steel
(Tubing/Rope): ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: _____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☒ No ☐ Yes Name: _____
MS/MSD : ☒ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/13/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Parthogue
Client: BC
Personnel: JC/MHM
Purge/Sample Depth: 10'

Project Number:
Date: 12/13/23
Well ID: MW-12S
Sample ID: MW-12S-20231213

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1404	6.33	15.54	0.381	3.15	8.9	-23	1.34	300	
1407	6.34	15.85	0.380	1.37	9.2	-27	1.37		
1410	6.53	15.83	0.381	1.42	9.4	-33	1.39		
1413	6.43	15.87	0.380	1.31	7.5	-37	1.41		
1416	6.58	15.86	0.385	1.47	4.7	-41	1.39		
1419	6.52	15.87	0.386	1.22	3.2	-42	1.41		
1422	6.58	15.90	0.384	1.30	2.5	-51	1.41		
1425	6.51	15.96	0.387	1.15	2.5	-46	1.40		
1428	6.51	15.96	0.388	1.09	2.5	-49	1.39		
1431	6.53	15.96	0.387	1.04	2.4	-49	1.39		
1434	6.63	15.94	0.389	1.19	2.6	-51	1.39	↓	
1437	collect	MW-12S-20231213							

JC 12/13/23

Certified Sample Information:
Time of Sample: 1437
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 10P AR 2RV
Serial No. Handheld: SFJ 480M1
Calibration Date/Time: 12/13/23 0940

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-12S
Sample I.D.: MW-12S-20231213

Project: Parkwyre
Personnel: JL JM HM

Date: 12/13/23 Time: 1404
Weather: Sunny Air Temp.: 47°F

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 1.28 ft Bottom of Well: 17.80 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 300 ml/min Elapsed Time: 30 min Volume Pumped: 3 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/13/23

Brown AND Caldwell
2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JC/MHM
Purge/Sample Depth: ~19'

Project Number:
Date: 12/13/23
Well ID: MW-12D
Sample ID: MW-12D-20231213

Actual Time	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	Certified Parameters								
1452	5.98	12.45	0.427	2.62	1.5	101	1.19	200	
1455	5.73	12.36	0.431	1.91	0.7	126	1.20		
1458	5.51	12.32	0.440	1.38	1.0	145	1.21		
1501	5.42	12.27	0.442	0.90	0.5	159	1.21		
1504	5.08	12.23	0.447	0.92	0.9	192	1.22		
1507	5.28	12.87	0.447	1.01	0.5	191	1.23		
1510	5.22	13.32	0.451	0.88	0.8	211	1.23		
1513	5.22	13.47	0.453	0.57	0.5	226	1.22		
1516	5.20	13.57	0.455	0.58	0.5	236	1.21		
1519	5.17	13.56	0.455	0.62	0.4	247	1.20		
1522	5.19	13.58	0.456	0.55	0.5	253	1.21		
1525	collect		MW-12D-20231213						

JC 12/13/23

Certified Sample Information:
Time of Sample: 1525

Analyst Signature: [signature]

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: LOPARLRU
Calibration Date/Time: 12/13/23 0940
Serial No. Handheld: SFJ480MS

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-12D
Sample I.D.: MW-12D-20231213

Project: Patchogue
Personnel: TC/MHM

Date: 12/13/23 Time: 1452
Weather: Sunny Air Temp.: 47°F

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: _____ ft Bottom of Well: _____ ft
DATUM: ☐ Top of Protective Casing ☐ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☐ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
(Tubing/Rope): ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: _____ Elapsed Time: _____ Volume Pumped: _____
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: (Pump/Bailer): ☐ Teflon® ☑ Stainless Steel
(Tubing/Rope): ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/13/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JL / MHM
Purge/Sample Depth: ~9'

Project Number:
Date: 12/14/23
Well ID: MW-11S
Sample ID: MW-11S-20231214

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
0927	6.48	14.22	0.777	12.29	19.5	-103	0.75	300	
0930	6.65	14.17	0.768	[illegible].48	21.9	-115	0.75		
0933	6.72	14.21	0.760	10.67	25.0	-116	0.75		
0936	6.82	14.33	0.752	10.36	21.2	-124	0.76		
0939	6.85	14.32	0.748	9.91	18.9	-125	0.76		
0942	6.85	14.34	0.748	9.84	17.9	-128	0.76		
0945	6.83	14.35	0.745	9.25	15.2	-126	0.76		
0948	6.87	14.33	0.742	8.87	14.2	-129	0.75		
0951	6.87	14.32	0.744	8.80	12.5	-132	0.77		
0954	6.86	14.41	0.745	8.59	12.2	-133	0.76		
0957	6.90	14.53	0.747	7.94	10.6	-137	0.78		
1000	Collect MW-11S-20231214 + Dup-20231214								

12/14/23

Certified Sample Information:
Time of Sample: 1000
Analyst Signature: [signature]

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: LOPARLRV
Serial No. Handheld: SPJ480MS
Calibration Date/Time: 12/14/23 0915

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-11S
Sample I.D.: MW-11S-20231214

Project: Pathways
Personnel: JL/MH/TM

Date: 12/14/23 Time: 0947
Weather: sunny Air Temp.: 34°F

WELL DATA:

Casing Diameter: 6" ❑ Stainless Steel ☑ Steel ❑ PVC ❑ Teflon® ❑ Other: _____
Intake Diameter: 2" ❑ Stainless Steel ❑ Galv. Steel ☑ PVC ❑ Teflon® ❑ Open rock
DEPTH TO : Static Water Level: 0.68 ft Bottom of Well: 13.75 ft
DATUM: ❑ Top of Protective Casing ☑ Top of Well Casing ❑ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ❑ No Is well clean to bottom? ☑ Yes ❑ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ❑ No
Does Weep Hole adequately drain well head? ☑ Yes ❑ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ❑ No
Is Padlock Functional? ❑ Yes ❑ No ☑ NA Is Inner Casing Intact? ☑ Yes ❑ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ❑ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ❑ Bailer, Size: ____ ☑ Bladder Pump ❑ 2" Submersible Pump ❑ 4" Submersible Pump
❑ Centrifugal Pump ❑ Peristaltic Pump ❑ Inertial Lift Pump ❑ Other: _____

MATERIALS: Pump/Bailer: ❑ Teflon® ☑ Stainless Steel ❑ PVC ❑ Other: _____
Tubing/Rope: ☑ Teflon® ❑ Polyethylene ❑ Polypropylene ❑ Other: _____

Pumping Rate: 300 mL/min Elapsed Time: 30 min Volume Pumped: 3 gal
Was well Evacuated? ❑ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ❑ Dedicated ❑ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ❑ Bailer, Size: ____ ☑ Bladder Pump ❑ 2" Submersible Pump ❑ 4" Submersible Pump
❑ Syringe Sampler ❑ Peristaltic Pump ❑ Inertial Lift Pump ❑ Other: _____

MATERIALS: Pump/Bailer: ❑ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ❑ Polyethylene

SAMPLING EQUIPMENT: ❑ Dedicated ❑ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ❑ Yes ☑ No Method: _____
APPEARANCE: ❑ Clear ❑ Turbid ❑ Color: _____ ❑ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ❑ No ☑ Yes Name: DUP-20231214
MS/MSD : ☑ No ❑ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/14/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Patchogue
Client: BC
Personnel: JC / MH / MM
Purge/Sample Depth: ~6'

Project Number:
Date: 12/14/23
Well ID: MW-85
Sample ID: MW-85-20231214

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1018	6.67	13.19	0.444	10.87	979	-48	0.70	250	
1021	6.59	13.88	0.432	9.50	354	-47	0.70		
1024	6.56	14.10	0.425	9.02	144	-44	0.66		
1027	6.54	14.38	0.423	8.96	57.9	-46	0.70		
1030	6.55	14.11	0.427	8.51	27.9	-50	0.65		
1033	6.50	13.63	0.426	8.98	24.4	-42	0.65		
1036	6.52	13.66	0.425	8.76	22.5	-43	0.65		
1039	6.56	13.65	0.425	8.64	20.0	-46	0.66		
1042	6.56	13.53	0.425	8.77	15.5	-47	0.68		
1045	6.56	13.53	0.425	8.22	11.3	-48	0.70		
1048	6.56	13.52	0.425	8.15	10.9	-44	0.70		
1051	Collect MW-85-20231214								

JC

12/14/23

Certified Sample Information:
Time of Sample: 1051
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 10PARLRV
Calibration Date/Time: 12/14/23 0915
Serial No. Handheld: 5FJ480MS

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-8S
Sample I.D.: MW-8S - 20231214

Project: Patchogue
Personnel: JC / MHM

Date: 12/14/23 Time: 1018
Weather: Sunny Air Temp.: 34° F

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 0.51 ft Bottom of Well: 9.83 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 250 mL/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/14/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name:	Parchoque	Project Number:	
Client:	BC	Date:	12/14/23
Personnel:	JC/MHm	Well ID:	MW-10S
Purge/Sample Depth:	~16'	Sample ID:	MW-10S-20231214

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1117	6.78	13.85	0.592	2.62	22.4	-111	0.90	200	
1120	6.84	14.45	0.604	2.52	18.8	-118	0.92		
1123	6.87	14.61	0.607	2.36	16.5	-122	0.94		
1126	6.89	14.80	0.609	2.30	18.8	-124	0.90		
1129	6.88	14.95	0.607	2.09	25.6	-126	0.91		
1132	6.89	14.95	0.609	2.06	25.1	-127	0.90		
1135	6.87	15.00	0.615	1.99	20.0	-128	0.90		
1138	6.87	15.10	0.621	1.89	18.3	-129	0.92		
1141	6.89	15.15	0.634	1.80	17.7	-127	0.90		
1144	6.82	15.30	0.649	1.69	12.9	-127	0.91		
1147	6.82	15.36	0.664	1.63	11.5	-125	0.94		
1150	Collect MW-10S-20231214 + MS/MSD								

JC 12/14/23

Certified Sample Information:
Time of Sample: 1150 Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: LOPARLRV Serial No. Handheld: 5FJ480M3
Calibration Date/Time: 12/14/23 0915

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-105
Sample I.D.: MW-105-20231214

Project: Ratchoyne
Personnel: JL MH HM

Date: 12/14/23 Time: 1119
Weather: Sunny Air Temp.: 37° F

WELL DATA:

Casing Diameter: 4" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 0.80 ft Bottom of Well: 15.51 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☐ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 200 mL/min Elapsed Time: 30 min Volume Pumped: 2 gal.
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☐ No ☑ Yes Name: MW-105-20231214 (MS), MW-105-20231214 (MSD)

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/14/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Pathogen
Client: BC
Personnel: JC/MHM
Purge/Sample Depth: 21'
Project Number:
Date: 12/14/23
Well ID: MW-7S
Sample ID: MW-7S-20231214

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1310	7.01	11.86	0.661	5.82	74.9	-144	4.35	250	
1313	6.94	11.99	0.658	4.94	67.4	-143	4.38		
1316	7.02	12.09	0.654	4.53	71.1	-143	4.42		
1319	6.99	12.10	0.652	4.23	72.7	-143	4.40		
1322	7.05	12.12	0.649	4.17	53.9	-145	4.42		
1325	7.01	12.14	0.647	4.02	47.3	-144	4.42		
1328	7.02	12.09	0.643	3.93	41.6	-144	4.40		
1331	7.03	12.17	0.638	3.83	32.9	-145	4.35		
1334	7.01	12.14	0.636	3.70	30.7	-143	4.40		
1337	7.02	12.17	0.633	3.63	24.1	-145	4.41		
1340	7.02	12.13	0.631	3.86	21.2	-144	4.42		
1343	Collect MW-7S-20231214								
						12/14/23			

Certified Sample Information:
Time of Sample: 1343
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 40PARLR ✓
Serial No. Handheld: SFJ450MS
Calibration Date/Time: 12/14/23 0915

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-7S
Sample I.D.: MW-7S - 20231214

Project: Patchogue
Personnel: JC / MHm

Date: 12/14/23 Time: 1310
Weather: Sunny Air Temp.: 38°F

WELL DATA:

Casing Diameter: 4" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 4.12 ft Bottom of Well: 12.36 ft
DATUM: ☐ Top of Protective Casing ☐ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☐ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☐ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No ☐ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 150 mL/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/14/23

Brown AND Caldwell

2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name:	Pathfinder	Project Number:	
Client:	BC	Date:	12/14/23
Personnel:	JL / MHM	Well ID:	MW-14S
Purge/Sample Depth:	~9'	Sample ID:	MW-14S-20231214

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1401	6.92	12.30	0.418	4.34	165	-63	0.91	250	
1404	6.84	12.60	0.416	1.80	106	-29	0.93		
1407	6.86	12.59	0.426	1.33	70.1	-13	0.92		
1410	6.82	12.57	0.435	1.18	57.2	-5	0.91		
1413	6.82	12.54	0.448	0.93	35.8	4	0.94		
1416	6.74	12.58	0.456	0.86	30.8	14	0.95		
1419	6.66	12.57	0.463	0.81	21.9	23	0.96		
1422	6.62	12.53	0.469	0.85	13.4	34	0.96		
1425	6.60	12.54	0.473	0.79	9.7	43	0.95		
1428	6.52	12.54	0.478	0.67	8.2	51	0.95		
1431	6.55	12.56	0.479	0.70	6.3	53	0.95		
1434	(Olive) MW-14S-20231214								

12/14/23

Certified Sample Information:
Time of Sample: 1434 Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 10PARRV Serial No. Handheld: SFJ480MJ
Calibration Date/Time: 12/14/23 0915

Are low-flow parameters subject to field lab certification? ☐ Yes ☑ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

Brown AND Caldwell

Upper Saddle River, NJ Office

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Well Number: MW-14S
Sample I.D.: MW-14S-20231214

Project: Patenogue
Personnel: JC MH HM

Date: 12/14/23 Time: 1401
Weather: Sunny Air Temp.: 39°F

WELL DATA:

Casing Diameter: 6" ☐ Stainless Steel ☑ Steel ☐ PVC ☐ Teflon® ☐ Other: _____
Intake Diameter: 6" ☐ Stainless Steel ☐ Galv. Steel ☑ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 0.73 ft Bottom of Well: 12.60 ft
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☑ Yes ☐ No Is well clean to bottom? ☑ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Does Weep Hole adequately drain well head? ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☑ NA Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 750 mL/min Elapsed Time: 30 min Volume Pumped: 2.5 gal.
Was well Evacuated? ☐ Yes ☑ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☑ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☑ Stainless Steel
Tubing/Rope: ☑ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☑ Field Cleaned
Metals samples field filtered? ☐ Yes ☑ No Method: _____
APPEARANCE: ☑ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☑ No ☐ Yes Name: _____
MS/MSD : ☑ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 12/14/23

Brown AND Caldwell
2 Park Way, Upper Saddle River, NJ 07458
Phone: (201) 574-4700 Fax: (201) 236-1607

NJ FIELD LAB ID# 02023
LOW-FLOW GROUNDWATER FIELD DATA SHEET

Project Name: Parkway
Client: BC
Personnel: JL/MHm
Purge/Sample Depth: ~7.5'
Project Number:
Date: 12/14/23
Well ID: MW-4S
Sample ID: MW-4S-20231214

Actual Time	Certified Parameters					ORP (mV)	DTW (ft)	Pumping Rate (mL/min)	Comments
	pH	Temp (°C)	Cond (mS/cm)	DO (mg/L)	Turbidity (NTU)				
1503	6.54	12.10	0.405	2.31	1000	-30	4.95	250	
1506	6.59	12.65	0.425	1.04	423	-92	4.97		
1509	6.59	12.75	0.428	0.99	290	-102	4.96		
1512	6.96	12.82	0.428	1.16	151	-112	4.96		
1515	6.91	13.05	0.432	1.83	121	-121	4.95		
1518	6.84	12.91	0.433	1.77	77.4	-119	4.95		
1521	6.89	13.03	0.432	2.04	54.4	-126	4.94		
1524	7.01	13.16	0.432	1.83	44.9	-132	4.95		
1527	7.06	13.05	0.434	1.54	37.4	-136	4.97		
1530	7.09	13.12	0.433	1.61	34.1	-137	4.96		
1533	7.07	13.10	0.432	1.79	30.4	-136	4.95	↓	
1536	collect	MW-4S-20231214							

JL 12/14/23

Certified Sample Information:
Time of Sample: 1536
Analyst Signature:

Instrument Data:
Manufacturer/Model: Horiba U-52
Serial No. Unit: 10PARLRV
Serial No. Handheld: SFJ 480m1
Calibration Date/Time: 12/14/23 0915

Are low-flow parameters subject to field lab certification? ☐ Yes ☒ No (not required for CERCLA sites or sites outside of NJ)

If yes, low-flow data must be accompanied by a completed "Field Calibration Record, Horiba U-52" form or equivalent.

LOW-FLOW GROUNDWATER SAMPLING FIELD DATA

Brown AND Caldwell Upper Saddle River, NJ Office

Well Number: MW-45
Sample I.D.: MW-45-20231214

Project: Pathfinder
Personnel: JL / MHM

Date: 12/14/23 Time: 1503
Weather: Sunny Air Temp.: 39°F

WELL DATA:

Casing Diameter: 4" ☐ Stainless Steel ☒ Steel ☐ PVC ☐ Teflon® ☐ Other: ____
Intake Diameter: 2" ☐ Stainless Steel ☐ Galv. Steel ☒ PVC ☐ Teflon® ☐ Open rock
DEPTH TO : Static Water Level: 4.56 ft Bottom of Well: 12.26 ft
DATUM: ☐ Top of Protective Casing ☒ Top of Well Casing ☐ Other:
CONDITION: Is Well clearly labeled? ☒ Yes ☐ No Is well clean to bottom? ☒ Yes ☐ No
Is Prot. Casing/Surface Mount in Good Cond.? (not bent or corroded) ☒ Yes ☐ No
Does Weep Hole adequately drain well head? ☒ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☒ Yes ☐ No
Is Padlock Functional? ☐ Yes ☐ No ☒ NA Is Inner Casing Intact? ☒ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☒ Yes ☐ No
VOLUME OF WATER: Standing in well: _____ To be purged: _____

PURGE DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☒ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: _____

Pumping Rate: 250 ml/min Elapsed Time: 30 min Volume Pumped: 2.5 gal
Was well Evacuated? ☐ Yes ☐ No Number of Well Volumes Removed: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned

SAMPLING DATA:

METHOD: ☐ Bailer, Size: ____ ☒ Bladder Pump ☐ 2" Submersible Pump ☐ 4" Submersible Pump
☐ Syringe Sampler ☐ Peristaltic Pump ☐ Inertial Lift Pump ☐ Other: _____

MATERIALS: Pump/Bailer: ☐ Teflon® ☒ Stainless Steel
Tubing/Rope: ☒ Teflon® ☐ Polyethylene

SAMPLING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☒ Field Cleaned
Metals samples field filtered? ☐ Yes ☒ No Method: _____
APPEARANCE: ☒ Clear ☐ Turbid ☐ Color: _____ ☐ Contains Immiscible Liquid
FIELD DETERMINATIONS: See attached form for field parameter data.

DUP : ☒ No ☐ Yes Name: _____
MS/MSD : ☒ No ☐ Yes Name: _____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: [signature] Date: 12/14/23

Appendix B: Laboratory Data Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. James L Marolda
Brown and Caldwell
500 North Franklin Turnpike
Suite 306
Ramsey, New Jersey 07446

Generated 12/27/2023 7:26:34 PM

JOB DESCRIPTION

Patchogue, NY

JOB NUMBER

410-155043-1

Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization

Barb Weyandt

Generated
12/27/2023 7:26:34 PM

Authorized for release by
Barbara Weyandt, Project Manager
Barbara.Weyandt@et.eurofinsus.com
(717)556-7264

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Barb Weyandt

Table of Contents

Definitions/Glossary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job Narrative
410-155043-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 12/15/2023 6:10 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.1°C and 0.3°C

Receipt Exceptions
The container count for the following sample did not match what was listed on the Chain-of-Custody (COC): TB-20231214 (410-155043-15).
The laboratory received 4 total containers, while the COC lists 2 total containers.

GC/MS VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E_SIM: The continuing calibration verification (CCV) associated with batch 951027 recovered above the upper control limit for Benzo[g,h,i]perylene, Dibenz(a,h)anthracene and Indeno[1,2,3-cd]pyrene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8270E_SIM: The continuing calibration verification (CCV) associated with batch 460-951465 recovered above the upper control limit for Dibenz(a,h)anthracene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8270E_SIM: The continuing calibration verification (CCV) associated with batch 460-951659 recovered above the upper control limit for Indeno[1,2,3-cd]pyrene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Client Sample ID: MW-1-20231213 — Lab Sample ID: 410-155043-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.019	J	0.050	0.016	ug/L	1		8270E SIM	Total/NA
Dibenz(a,h)anthracene	0.021	J	0.050	0.020	ug/L	1		8270E SIM	Total/NA
Fluorene	0.016	J	0.050	0.012	ug/L	1		8270E SIM	Total/NA
Phenanthrene	0.030	J	0.050	0.022	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-3-20231213 — Lab Sample ID: 410-155043-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.68	J	1.0	0.30	ug/L	1		8260D	Total/NA
Ethylbenzene	2.1		1.0	0.40	ug/L	1		8260D	Total/NA
Toluene	0.62	J	1.0	0.30	ug/L	1		8260D	Total/NA
Xylenes, Total	1.8		1.0	0.40	ug/L	1		8260D	Total/NA
Acenaphthylene	2.5		0.050	0.015	ug/L	1		8270E SIM	Total/NA
Anthracene	1.7		0.050	0.025	ug/L	1		8270E SIM	Total/NA
Benzo[a]anthracene	0.24		0.050	0.016	ug/L	1		8270E SIM	Total/NA
Chrysene	0.13		0.050	0.030	ug/L	1		8270E SIM	Total/NA
Fluoranthene	8.3		0.050	0.039	ug/L	1		8270E SIM	Total/NA
Fluorene	7.9		0.050	0.012	ug/L	1		8270E SIM	Total/NA
Phenanthrene	14		0.050	0.022	ug/L	1		8270E SIM	Total/NA
Pyrene	8.2		0.050	0.031	ug/L	1		8270E SIM	Total/NA
Acenaphthene - DL	33		0.25	0.071	ug/L	5		8270E SIM	Total/NA
Naphthalene - DL	54		1.0	0.62	ug/L	5		8270E SIM	Total/NA

Client Sample ID: MW-13S-20231213 — Lab Sample ID: 410-155043-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.49	J	1.0	0.30	ug/L	1		8260D	Total/NA
Acenaphthene	5.5		0.050	0.014	ug/L	1		8270E SIM	Total/NA
Acenaphthylene	0.20		0.050	0.015	ug/L	1		8270E SIM	Total/NA
Anthracene	0.51		0.050	0.025	ug/L	1		8270E SIM	Total/NA
Benzo[a]anthracene	0.16		0.050	0.016	ug/L	1		8270E SIM	Total/NA
Chrysene	0.11		0.050	0.030	ug/L	1		8270E SIM	Total/NA
Fluoranthene	1.4		0.050	0.039	ug/L	1		8270E SIM	Total/NA
Fluorene	2.1		0.050	0.012	ug/L	1		8270E SIM	Total/NA
Naphthalene	0.19	J	0.20	0.12	ug/L	1		8270E SIM	Total/NA
Phenanthrene	1.3		0.050	0.022	ug/L	1		8270E SIM	Total/NA
Pyrene	1.6		0.050	0.031	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-13D-20231213 — Lab Sample ID: 410-155043-4

No Detections.

Client Sample ID: MW-12S-20231213 — Lab Sample ID: 410-155043-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.017	J	0.050	0.014	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-12D-20231213 — Lab Sample ID: 410-155043-6

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Client Sample ID: MW-11S-20231214 — Lab Sample ID: 410-155043-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.31	J	1.0	0.30	ug/L	1		8260D	Total/NA
Acenaphthylene	0.49		0.050	0.015	ug/L	1		8270E SIM	Total/NA
Anthracene	3.1		0.050	0.025	ug/L	1		8270E SIM	Total/NA
Benzo[a]anthracene	0.27		0.050	0.016	ug/L	1		8270E SIM	Total/NA
Benzo[a]pyrene	0.13		0.050	0.022	ug/L	1		8270E SIM	Total/NA
Benzo[b]fluoranthene	0.20		0.050	0.024	ug/L	1		8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.080		0.050	0.035	ug/L	1		8270E SIM	Total/NA
Benzo[k]fluoranthene	0.054		0.050	0.028	ug/L	1		8270E SIM	Total/NA
Chrysene	0.29		0.050	0.030	ug/L	1		8270E SIM	Total/NA
Fluoranthene	3.0		0.050	0.039	ug/L	1		8270E SIM	Total/NA
Fluorene	7.6		0.050	0.012	ug/L	1		8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.099		0.050	0.036	ug/L	1		8270E SIM	Total/NA
Naphthalene	2.4		0.20	0.12	ug/L	1		8270E SIM	Total/NA
Pyrene	3.8		0.050	0.031	ug/L	1		8270E SIM	Total/NA
Acenaphthene - DL	34		0.25	0.071	ug/L	5		8270E SIM	Total/NA
Phenanthrene - DL	12		0.25	0.11	ug/L	5		8270E SIM	Total/NA

Client Sample ID: MW-8S-20231214 — Lab Sample ID: 410-155043-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.23		0.050	0.014	ug/L	1		8270E SIM	Total/NA
Fluorene	0.013	J	0.050	0.012	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-10S-20231214 — Lab Sample ID: 410-155043-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.019	J	0.050	0.014	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-7S-20231214 — Lab Sample ID: 410-155043-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.072		0.050	0.014	ug/L	1		8270E SIM	Total/NA
Anthracene	0.050		0.050	0.025	ug/L	1		8270E SIM	Total/NA
Fluorene	0.028	J	0.050	0.012	ug/L	1		8270E SIM	Total/NA
Phenanthrene	0.027	J	0.050	0.022	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-14S-20231214 — Lab Sample ID: 410-155043-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.25		0.050	0.014	ug/L	1		8270E SIM	Total/NA
Fluorene	0.027	J	0.050	0.012	ug/L	1		8270E SIM	Total/NA
Naphthalene	0.40		0.20	0.12	ug/L	1		8270E SIM	Total/NA

Client Sample ID: MW-4S-20231214 — Lab Sample ID: 410-155043-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthylene	0.27		0.050	0.015	ug/L	1		8270E SIM	Total/NA
Anthracene	0.21		0.050	0.025	ug/L	1		8270E SIM	Total/NA
Fluoranthene	3.1		0.050	0.039	ug/L	1		8270E SIM	Total/NA
Fluorene	3.7		0.050	0.012	ug/L	1		8270E SIM	Total/NA
Naphthalene	0.21		0.20	0.12	ug/L	1		8270E SIM	Total/NA
Phenanthrene	0.063		0.050	0.022	ug/L	1		8270E SIM	Total/NA
Pyrene	3.9		0.050	0.031	ug/L	1		8270E SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-4S-20231214 (Continued) — Lab Sample ID: 410-155043-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene - DL	18		0.10	0.028	ug/L	2		8270E SIM	Total/NA

Client Sample ID: DUP-20231214 — Lab Sample ID: 410-155043-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.30	J	1.0	0.30	ug/L	1		8260D	Total/NA
Xylenes, Total	0.42	J	1.0	0.40	ug/L	1		8260D	Total/NA
Acenaphthylene	0.47		0.050	0.015	ug/L	1		8270E SIM	Total/NA
Anthracene	1.5		0.050	0.025	ug/L	1		8270E SIM	Total/NA
Benzo[a]anthracene	0.22		0.050	0.016	ug/L	1		8270E SIM	Total/NA
Benzo[a]pyrene	0.10		0.050	0.022	ug/L	1		8270E SIM	Total/NA
Benzo[b]fluoranthene	0.14		0.050	0.024	ug/L	1		8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.069		0.050	0.035	ug/L	1		8270E SIM	Total/NA
Benzo[k]fluoranthene	0.059		0.050	0.028	ug/L	1		8270E SIM	Total/NA
Chrysene	0.23		0.050	0.030	ug/L	1		8270E SIM	Total/NA
Fluoranthene	2.7		0.050	0.039	ug/L	1		8270E SIM	Total/NA
Fluorene	3.5		0.050	0.012	ug/L	1		8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.083		0.050	0.036	ug/L	1		8270E SIM	Total/NA
Naphthalene	0.28		0.20	0.12	ug/L	1		8270E SIM	Total/NA
Phenanthrene	0.27		0.050	0.022	ug/L	1		8270E SIM	Total/NA
Pyrene	3.4		0.050	0.031	ug/L	1		8270E SIM	Total/NA
Acenaphthene - DL	30		0.25	0.071	ug/L	5		8270E SIM	Total/NA

Client Sample ID: FB-20231214 — Lab Sample ID: 410-155043-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.026	J	0.050	0.014	ug/L	1		8270E SIM	Total/NA
Fluorene	0.015	J	0.050	0.012	ug/L	1		8270E SIM	Total/NA
Phenanthrene	0.038	J	0.050	0.022	ug/L	1		8270E SIM	Total/NA

Client Sample ID: TB-20231214 — Lab Sample ID: 410-155043-15

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1-20231213

Lab Sample ID: 410-155043-1

Date Collected: 12/13/23 10:21

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/22/23 03:36	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/22/23 03:36	1
Toluene	ND		1.0	0.30	ug/L			12/22/23 03:36	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/22/23 03:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*12/22/23 03:36*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/22/23 03:36*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*12/22/23 03:36*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/22/23 03:36*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.050	0.014	ug/L		12/20/23 11:12	12/21/23 18:57	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/20/23 11:12	12/21/23 18:57	1
Anthracene	ND		0.050	0.025	ug/L		12/20/23 11:12	12/21/23 18:57	1
Benzo[a]anthracene	**0.019**	**J**	0.050	0.016	ug/L		12/20/23 11:12	12/21/23 18:57	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 18:57	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/20/23 11:12	12/21/23 18:57	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/20/23 11:12	12/21/23 18:57	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/20/23 11:12	12/21/23 18:57	1
Chrysene	ND		0.050	0.030	ug/L		12/20/23 11:12	12/21/23 18:57	1
Dibenz(a,h)anthracene	**0.021**	**J** J, RC:SH	0.050	0.020	ug/L		12/20/23 11:12	12/21/23 18:57	1
Fluoranthene	ND		0.050	0.039	ug/L		12/20/23 11:12	12/21/23 18:57	1
Fluorene	**0.016**	**J**	0.050	0.012	ug/L		12/20/23 11:12	12/21/23 18:57	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/20/23 11:12	12/21/23 18:57	1
Naphthalene	ND		0.20	0.12	ug/L		12/20/23 11:12	12/21/23 18:57	1
Phenanthrene	**0.030**	**J**	0.050	0.022	ug/L		12/20/23 11:12	12/21/23 18:57	1
Pyrene	ND		0.050	0.031	ug/L		12/20/23 11:12	12/21/23 18:57	1

Client Sample ID: MW-3-20231213

Lab Sample ID: 410-155043-2

Date Collected: 12/13/23 11:31

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.68**	**J**	1.0	0.30	ug/L			12/21/23 00:14	1
Ethylbenzene	**2.1**		1.0	0.40	ug/L			12/21/23 00:14	1
Toluene	**0.62**	**J**	1.0	0.30	ug/L			12/21/23 00:14	1
Xylenes, Total	**1.8**		1.0	0.40	ug/L			12/21/23 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*80 - 120*		*12/21/23 00:14*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/21/23 00:14*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 120*		*12/21/23 00:14*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/21/23 00:14*	*1*

Client Sample ID: MW-3-20231213

Lab Sample ID: 410-155043-2

Date Collected: 12/13/23 11:31

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	**2.5**		0.050	0.015	ug/L		12/20/23 11:12	12/21/23 19:18	1
Anthracene	**1.7**		0.050	0.025	ug/L		12/20/23 11:12	12/21/23 19:18	1
Benzo[a]anthracene	**0.24**		0.050	0.016	ug/L		12/20/23 11:12	12/21/23 19:18	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 19:18	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/20/23 11:12	12/21/23 19:18	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/20/23 11:12	12/21/23 19:18	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/20/23 11:12	12/21/23 19:18	1
Chrysene	**0.13**		0.050	0.030	ug/L		12/20/23 11:12	12/21/23 19:18	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/20/23 11:12	12/21/23 19:18	1
Fluoranthene	**8.3**		0.050	0.039	ug/L		12/20/23 11:12	12/21/23 19:18	1
Fluorene	**7.9**		0.050	0.012	ug/L		12/20/23 11:12	12/21/23 19:18	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/20/23 11:12	12/21/23 19:18	1
Phenanthrene	**14**		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 19:18	1
Pyrene	**8.2**		0.050	0.031	ug/L		12/20/23 11:12	12/21/23 19:18	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**33**		0.25	0.071	ug/L		12/20/23 11:12	12/22/23 14:10	5
Naphthalene	**54**		1.0	0.62	ug/L		12/20/23 11:12	12/22/23 14:10	5

Client Sample ID: MW-13S-20231213

Lab Sample ID: 410-155043-3

Date Collected: 12/13/23 12:59

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.49**	**J**	1.0	0.30	ug/L			12/21/23 00:33	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/21/23 00:33	1
Toluene	ND		1.0	0.30	ug/L			12/21/23 00:33	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/21/23 00:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*12/21/23 00:33*	*1*
4-Bromofluorobenzene (Surr)	*112*		*80 - 120*		*12/21/23 00:33*	*1*
Dibromofluoromethane (Surr)	*111*		*80 - 120*		*12/21/23 00:33*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/21/23 00:33*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**5.5**		0.050	0.014	ug/L		12/20/23 11:12	12/21/23 19:39	1
Acenaphthylene	**0.20**		0.050	0.015	ug/L		12/20/23 11:12	12/21/23 19:39	1
Anthracene	**0.51**		0.050	0.025	ug/L		12/20/23 11:12	12/21/23 19:39	1
Benzo[a]anthracene	**0.16**		0.050	0.016	ug/L		12/20/23 11:12	12/21/23 19:39	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 19:39	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/20/23 11:12	12/21/23 19:39	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/20/23 11:12	12/21/23 19:39	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/20/23 11:12	12/21/23 19:39	1
Chrysene	**0.11**		0.050	0.030	ug/L		12/20/23 11:12	12/21/23 19:39	1

Client Sample ID: MW-13S-20231213

Lab Sample ID: 410-155043-3
Matrix: Water
Date Collected: 12/13/23 12:59
Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/20/23 11:12	12/21/23 19:39	1
Fluoranthene	**1.4**		0.050	0.039	ug/L		12/20/23 11:12	12/21/23 19:39	1
Fluorene	**2.1**		0.050	0.012	ug/L		12/20/23 11:12	12/21/23 19:39	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/20/23 11:12	12/21/23 19:39	1
Naphthalene	**0.19**	**J**	0.20	0.12	ug/L		12/20/23 11:12	12/21/23 19:39	1
Phenanthrene	**1.3**		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 19:39	1
Pyrene	**1.6**		0.050	0.031	ug/L		12/20/23 11:12	12/21/23 19:39	1

Client Sample ID: MW-13D-20231213

Lab Sample ID: 410-155043-4
Matrix: Water
Date Collected: 12/13/23 13:44
Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/21/23 00:53	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/21/23 00:53	1
Toluene	ND		1.0	0.30	ug/L			12/21/23 00:53	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/21/23 00:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*12/21/23 00:53*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/21/23 00:53*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 120*		*12/21/23 00:53*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*12/21/23 00:53*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.050	0.014	ug/L		12/20/23 11:12	12/21/23 20:00	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/20/23 11:12	12/21/23 20:00	1
Anthracene	ND		0.050	0.025	ug/L		12/20/23 11:12	12/21/23 20:00	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/20/23 11:12	12/21/23 20:00	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 20:00	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/20/23 11:12	12/21/23 20:00	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/20/23 11:12	12/21/23 20:00	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/20/23 11:12	12/21/23 20:00	1
Chrysene	ND		0.050	0.030	ug/L		12/20/23 11:12	12/21/23 20:00	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/20/23 11:12	12/21/23 20:00	1
Fluoranthene	ND		0.050	0.039	ug/L		12/20/23 11:12	12/21/23 20:00	1
Fluorene	ND		0.050	0.012	ug/L		12/20/23 11:12	12/21/23 20:00	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/20/23 11:12	12/21/23 20:00	1
Naphthalene	ND		0.20	0.12	ug/L		12/20/23 11:12	12/21/23 20:00	1
Phenanthrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 20:00	1
Pyrene	ND		0.050	0.031	ug/L		12/20/23 11:12	12/21/23 20:00	1

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Client Sample ID: MW-12S-20231213

Lab Sample ID: 410-155043-5

Date Collected: 12/13/23 14:37

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/21/23 01:13	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/21/23 01:13	1
Toluene	ND		1.0	0.30	ug/L			12/21/23 01:13	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/21/23 01:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*80 - 120*		*12/21/23 01:13*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/21/23 01:13*	*1*
Dibromofluoromethane (Surr)	*110*		*80 - 120*		*12/21/23 01:13*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*12/21/23 01:13*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**0.017**	**J**	0.050	0.014	ug/L		12/20/23 11:12	12/21/23 20:21	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/20/23 11:12	12/21/23 20:21	1
Anthracene	ND		0.050	0.025	ug/L		12/20/23 11:12	12/21/23 20:21	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/20/23 11:12	12/21/23 20:21	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 20:21	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/20/23 11:12	12/21/23 20:21	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/20/23 11:12	12/21/23 20:21	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/20/23 11:12	12/21/23 20:21	1
Chrysene	ND		0.050	0.030	ug/L		12/20/23 11:12	12/21/23 20:21	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/20/23 11:12	12/21/23 20:21	1
Fluoranthene	ND		0.050	0.039	ug/L		12/20/23 11:12	12/21/23 20:21	1
Fluorene	ND		0.050	0.012	ug/L		12/20/23 11:12	12/21/23 20:21	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/20/23 11:12	12/21/23 20:21	1
Naphthalene	ND		0.20	0.12	ug/L		12/20/23 11:12	12/21/23 20:21	1
Phenanthrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 20:21	1
Pyrene	ND		0.050	0.031	ug/L		12/20/23 11:12	12/21/23 20:21	1

Client Sample ID: MW-12D-20231213

Lab Sample ID: 410-155043-6

Date Collected: 12/13/23 15:25

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/21/23 01:32	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/21/23 01:32	1
Toluene	ND		1.0	0.30	ug/L			12/21/23 01:32	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/21/23 01:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*12/21/23 01:32*	*1*
4-Bromofluorobenzene (Surr)	*112*		*80 - 120*		*12/21/23 01:32*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 120*		*12/21/23 01:32*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*12/21/23 01:32*	*1*

Client Sample ID: MW-12D-20231213

Lab Sample ID: 410-155043-6

Date Collected: 12/13/23 15:25
Matrix: Water
Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.050	0.014	ug/L		12/20/23 11:12	12/21/23 20:42	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/20/23 11:12	12/21/23 20:42	1
Anthracene	ND		0.050	0.025	ug/L		12/20/23 11:12	12/21/23 20:42	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/20/23 11:12	12/21/23 20:42	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 20:42	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/20/23 11:12	12/21/23 20:42	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/20/23 11:12	12/21/23 20:42	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/20/23 11:12	12/21/23 20:42	1
Chrysene	ND		0.050	0.030	ug/L		12/20/23 11:12	12/21/23 20:42	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/20/23 11:12	12/21/23 20:42	1
Fluoranthene	ND		0.050	0.039	ug/L		12/20/23 11:12	12/21/23 20:42	1
Fluorene	ND		0.050	0.012	ug/L		12/20/23 11:12	12/21/23 20:42	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/20/23 11:12	12/21/23 20:42	1
Naphthalene	ND		0.20	0.12	ug/L		12/20/23 11:12	12/21/23 20:42	1
Phenanthrene	ND		0.050	0.022	ug/L		12/20/23 11:12	12/21/23 20:42	1
Pyrene	ND		0.050	0.031	ug/L		12/20/23 11:12	12/21/23 20:42	1

Client Sample ID: MW-11S-20231214

Lab Sample ID: 410-155043-7

Date Collected: 12/14/23 10:00
Matrix: Water
Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.31**	**J**	1.0	0.30	ug/L			12/23/23 02:35	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/23/23 02:35	1
Toluene	ND		1.0	0.30	ug/L			12/23/23 02:35	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/23/23 02:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*12/23/23 02:35*	*1*
4-Bromofluorobenzene (Surr)	*111*		*80 - 120*		*12/23/23 02:35*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*12/23/23 02:35*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/23/23 02:35*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	**0.49**		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 16:54	1
Anthracene	**3.1**	J, RC:8	0.050	0.025	ug/L		12/21/23 08:32	12/21/23 16:54	1
Benzo[a]anthracene	**0.27**		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 16:54	1
Benzo[a]pyrene	**0.13**	J, RC:SH	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 16:54	1
Benzo[b]fluoranthene	**0.20**		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 16:54	1
Benzo[g,h,i]perylene	**0.080**		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 16:54	1
Benzo[k]fluoranthene	**0.054**		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 16:54	1
Chrysene	**0.29**		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 16:54	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 16:54	1
Fluoranthene	**3.0**		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 16:54	1
Fluorene	**7.6**	J, RC:8	0.050	0.012	ug/L		12/21/23 08:32	12/21/23 16:54	1
Indeno[1,2,3-cd]pyrene	**0.099**		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 16:54	1

Client Sample ID: MW-11S-20231214

Lab Sample ID: 410-155043-7

Date Collected: 12/14/23 10:00
Matrix: Water
Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	**2.4**	J, RC:8	0.20	0.12	ug/L		12/21/23 08:32	12/21/23 16:54	1
Pyrene	**3.8**		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 16:54	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**34**		0.25	0.071	ug/L		12/21/23 08:32	12/22/23 14:30	5
Phenanthrene	**12**	J, RC:SL,8	0.25	0.11	ug/L		12/21/23 08:32	12/22/23 14:30	5

Client Sample ID: MW-8S-20231214

Lab Sample ID: 410-155043-8

Date Collected: 12/14/23 10:51
Matrix: Water
Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/23/23 02:56	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/23/23 02:56	1
Toluene	ND		1.0	0.30	ug/L			12/23/23 02:56	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/23/23 02:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*80 - 120*		*12/23/23 02:56*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/23/23 02:56*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*12/23/23 02:56*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/23/23 02:56*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**0.23**		0.050	0.014	ug/L		12/21/23 08:32	12/21/23 17:15	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 17:15	1
Anthracene	ND		0.050	0.025	ug/L		12/21/23 08:32	12/21/23 17:15	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 17:15	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 17:15	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 17:15	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 17:15	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 17:15	1
Chrysene	ND		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 17:15	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 17:15	1
Fluoranthene	ND		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 17:15	1
Fluorene	0.050	~~0.013 J~~	UJ, RC:7	0.050	0.012	ug/L	12/21/23 08:32	12/21/23 17:15	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 17:15	1
Naphthalene	ND		0.20	0.12	ug/L		12/21/23 08:32	12/21/23 17:15	1
Phenanthrene	ND	UJ, RC:SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 17:15	1
Pyrene	ND		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 17:15	1

Client Sample ID: MW-10S-20231214

Lab Sample ID: 410-155043-9

Date Collected: 12/14/23 11:50

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/22/23 22:10	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/22/23 22:10	1
Toluene	ND		1.0	0.30	ug/L			12/22/23 22:10	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/22/23 22:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*12/22/23 22:10*	*1*
4-Bromofluorobenzene (Surr)	*112*		*80 - 120*		*12/22/23 22:10*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*12/22/23 22:10*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/22/23 22:10*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte		Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.050	~~0.013~~ ~~J~~	UJ, RC:7	0.050	0.014	ug/L		12/21/23 08:32	12/21/23 15:52	1
Acenaphthylene		ND		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 15:52	1
Anthracene		ND		0.050	0.025	ug/L		12/21/23 08:32	12/21/23 15:52	1
Benzo[a]anthracene		ND		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 15:52	1
Benzo[a]pyrene		ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 15:52	1
Benzo[b]fluoranthene		ND		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 15:52	1
Benzo[g,h,i]perylene		ND		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 15:52	1
Benzo[k]fluoranthene		ND		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 15:52	1
Chrysene		ND		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 15:52	1
Dibenz(a,h)anthracene		ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 15:52	1
Fluoranthene		ND		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 15:52	1
Fluorene		ND		0.050	0.012	ug/L		12/21/23 08:32	12/21/23 15:52	1
Indeno[1,2,3-cd]pyrene		ND		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 15:52	1
Naphthalene		ND		0.20	0.12	ug/L		12/21/23 08:32	12/21/23 15:52	1
Phenanthrene		ND	UJ, RC:SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 15:52	1
Pyrene		ND		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 15:52	1

Client Sample ID: MW-7S-20231214

Lab Sample ID: 410-155043-10

Date Collected: 12/14/23 13:43

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/23/23 03:17	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/23/23 03:17	1
Toluene	ND		1.0	0.30	ug/L			12/23/23 03:17	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/23/23 03:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*12/23/23 03:17*	*1*
4-Bromofluorobenzene (Surr)	*112*		*80 - 120*		*12/23/23 03:17*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*12/23/23 03:17*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/23/23 03:17*	*1*

Client Sample ID: MW-7S-20231214

Lab Sample ID: 410-155043-10
Matrix: Water
Date Collected: 12/14/23 13:43
Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**0.072**	UJ, RC:7	0.050	0.014	ug/L		12/21/23 08:32	12/21/23 17:35	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 17:35	1
Anthracene	**0.050**		0.050	0.025	ug/L		12/21/23 08:32	12/21/23 17:35	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 17:35	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 17:35	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 17:35	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 17:35	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 17:35	1
Chrysene	ND		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 17:35	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 17:35	1
Fluoranthene	ND		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 17:35	1
Fluorene	0.050	~~0.028 J~~ UJ, RC:7	0.050	0.012	ug/L		12/21/23 08:32	12/21/23 17:35	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 17:35	1
Naphthalene	ND		0.20	0.12	ug/L		12/21/23 08:32	12/21/23 17:35	1
Phenanthrene	0.050	~~0.027 J~~ UJ, RC:7,SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 17:35	1
Pyrene	ND		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 17:35	1

Client Sample ID: MW-14S-20231214

Lab Sample ID: 410-155043-11
Matrix: Water
Date Collected: 12/14/23 14:34
Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/23/23 03:37	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/23/23 03:37	1
Toluene	ND		1.0	0.30	ug/L			12/23/23 03:37	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/23/23 03:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*12/23/23 03:37*	*1*
4-Bromofluorobenzene (Surr)	*111*		*80 - 120*		*12/23/23 03:37*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*12/23/23 03:37*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*12/23/23 03:37*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**0.25**		0.050	0.014	ug/L		12/21/23 08:32	12/21/23 17:56	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 17:56	1
Anthracene	ND		0.050	0.025	ug/L		12/21/23 08:32	12/21/23 17:56	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 17:56	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 17:56	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 17:56	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 17:56	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 17:56	1
Chrysene	ND		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 17:56	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 17:56	1
Fluoranthene	ND		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 17:56	1
Fluorene	0.050	~~0.027 J~~ UJ, RC:7	0.050	0.012	ug/L		12/21/23 08:32	12/21/23 17:56	1

Client Sample ID: MW-14S-20231214

Lab Sample ID: 410-155043-11

Date Collected: 12/14/23 14:34

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 17:56	1
Naphthalene	**0.40**		0.20	0.12	ug/L		12/21/23 08:32	12/21/23 17:56	1
Phenanthrene	ND	UJ, RC:SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 17:56	1
Pyrene	ND		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 17:56	1

Client Sample ID: MW-4S-20231214

Lab Sample ID: 410-155043-12

Date Collected: 12/14/23 15:36

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/23/23 03:57	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/23/23 03:57	1
Toluene	ND		1.0	0.30	ug/L			12/23/23 03:57	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/23/23 03:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*12/23/23 03:57*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/23/23 03:57*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*12/23/23 03:57*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/23/23 03:57*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	**0.27**		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 18:17	1
Anthracene	**0.21**		0.050	0.025	ug/L		12/21/23 08:32	12/21/23 18:17	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 18:17	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 18:17	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 18:17	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 18:17	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 18:17	1
Chrysene	ND		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 18:17	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 18:17	1
Fluoranthene	**3.1**		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 18:17	1
Fluorene	**3.7**		0.050	0.012	ug/L		12/21/23 08:32	12/21/23 18:17	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 18:17	1
Naphthalene	**0.21**		0.20	0.12	ug/L		12/21/23 08:32	12/21/23 18:17	1
Phenanthrene	**0.063**	UJ, RC:7,SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 18:17	1
Pyrene	**3.9**		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 18:17	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**18**		0.10	0.028	ug/L		12/21/23 08:32	12/22/23 14:51	2

Client Sample ID: DUP-20231214

Lab Sample ID: 410-155043-13

Date Collected: 12/14/23 00:00

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.30**	**J**	1.0	0.30	ug/L			12/23/23 04:17	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/23/23 04:17	1
Toluene	ND		1.0	0.30	ug/L			12/23/23 04:17	1
Xylenes, Total	**0.42**	**J**	1.0	0.40	ug/L			12/23/23 04:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*80 - 120*		*12/23/23 04:17*	*1*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*		*12/23/23 04:17*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 120*		*12/23/23 04:17*	*1*
Toluene-d8 (Surr)	*107*		*80 - 120*		*12/23/23 04:17*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	**0.47**		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 20:00	1
Anthracene	**1.5**	J, RC:8	0.050	0.025	ug/L		12/21/23 08:32	12/21/23 20:00	1
Benzo[a]anthracene	**0.22**		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 20:00	1
Benzo[a]pyrene	**0.10**	J, RC:SH	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 20:00	1
Benzo[b]fluoranthene	**0.14**		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 20:00	1
Benzo[g,h,i]perylene	**0.069**		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 20:00	1
Benzo[k]fluoranthene	**0.059**		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 20:00	1
Chrysene	**0.23**		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 20:00	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 20:00	1
Fluoranthene	**2.7**		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 20:00	1
Fluorene	**3.5**	J, RC:8	0.050	0.012	ug/L		12/21/23 08:32	12/21/23 20:00	1
Indeno[1,2,3-cd]pyrene	**0.083**		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 20:00	1
Naphthalene	**0.28**	J, RC:8	0.20	0.12	ug/L		12/21/23 08:32	12/21/23 20:00	1
Phenanthrene	**0.27**	J, RC:8,SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 20:00	1
Pyrene	**3.4**		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 20:00	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL
Lab: Eurofins Edison

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**30**		0.25	0.071	ug/L		12/21/23 08:32	12/22/23 15:12	5

Client Sample ID: FB-20231214

Lab Sample ID: 410-155043-14

Date Collected: 12/14/23 14:45

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/22/23 21:29	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/22/23 21:29	1
Toluene	ND		1.0	0.30	ug/L			12/22/23 21:29	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/22/23 21:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*80 - 120*		*12/22/23 21:29*	*1*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*12/22/23 21:29*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 120*		*12/22/23 21:29*	*1*
Toluene-d8 (Surr)	*108*		*80 - 120*		*12/22/23 21:29*	*1*

Client Sample ID: FB-20231214

Lab Sample ID: 410-155043-14

Date Collected: 12/14/23 14:45

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab: Eurofins Edison

Analyte	Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**0.026**	**J**		0.050	0.014	ug/L		12/21/23 08:32	12/21/23 18:37	1
Acenaphthylene	ND			0.050	0.015	ug/L		12/21/23 08:32	12/21/23 18:37	1
Anthracene	ND			0.050	0.025	ug/L		12/21/23 08:32	12/21/23 18:37	1
Benzo[a]anthracene	ND			0.050	0.016	ug/L		12/21/23 08:32	12/21/23 18:37	1
Benzo[a]pyrene	ND			0.050	0.022	ug/L		12/21/23 08:32	12/21/23 18:37	1
Benzo[b]fluoranthene	ND			0.050	0.024	ug/L		12/21/23 08:32	12/21/23 18:37	1
Benzo[g,h,i]perylene	ND			0.050	0.035	ug/L		12/21/23 08:32	12/21/23 18:37	1
Benzo[k]fluoranthene	ND			0.050	0.028	ug/L		12/21/23 08:32	12/21/23 18:37	1
Chrysene	ND			0.050	0.030	ug/L		12/21/23 08:32	12/21/23 18:37	1
Dibenz(a,h)anthracene	ND			0.050	0.020	ug/L		12/21/23 08:32	12/21/23 18:37	1
Fluoranthene	ND			0.050	0.039	ug/L		12/21/23 08:32	12/21/23 18:37	1
Fluorene	**0.015**	**J**		0.050	0.012	ug/L		12/21/23 08:32	12/21/23 18:37	1
Indeno[1,2,3-cd]pyrene	ND			0.050	0.036	ug/L		12/21/23 08:32	12/21/23 18:37	1
Naphthalene	ND			0.20	0.12	ug/L		12/21/23 08:32	12/21/23 18:37	1
Phenanthrene	**0.038**	**J**	J, RC:SL	0.050	0.022	ug/L		12/21/23 08:32	12/21/23 18:37	1
Pyrene	ND			0.050	0.031	ug/L		12/21/23 08:32	12/21/23 18:37	1

Client Sample ID: TB-20231214

Lab Sample ID: 410-155043-15

Date Collected: 12/14/23 00:00

Matrix: Water

Date Received: 12/15/23 18:10

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/22/23 21:50	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/22/23 21:50	1
Toluene	ND		1.0	0.30	ug/L			12/22/23 21:50	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/22/23 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*80 - 120*		*12/22/23 21:50*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*12/22/23 21:50*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 120*		*12/22/23 21:50*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*12/22/23 21:50*	*1*

Surrogate Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)	(80-120)
410-155043-1	MW-1-20231213	106	110	106	106
410-155043-2	MW-3-20231213	108	110	108	105
410-155043-3	MW-13S-20231213	107	112	111	106
410-155043-4	MW-13D-20231213	109	110	109	103
410-155043-5	MW-12S-20231213	110	110	110	103
410-155043-6	MW-12D-20231213	107	112	107	102
410-155043-7	MW-11S-20231214	107	111	104	106
410-155043-8	MW-8S-20231214	108	110	104	106
410-155043-9	MW-10S-20231214	107	112	105	106
410-155043-9 MS	MW-10S-20231214	103	106	102	110
410-155043-9 MSD	MW-10S-20231214	105	103	104	109
410-155043-10	MW-7S-20231214	106	112	105	105
410-155043-11	MW-14S-20231214	109	111	104	105
410-155043-12	MW-4S-20231214	109	110	105	106
410-155043-13	DUP-20231214	108	109	108	107
410-155043-14	FB-20231214	112	110	107	108
410-155043-15	TB-20231214	108	108	107	106
410-155055-B-3 MS	Matrix Spike	102	105	104	108
410-155055-C-3 MSD	Matrix Spike Duplicate	104	104	101	107
LCS 410-456568/4	Lab Control Sample	104	113	104	115
LCS 410-457095/4	Lab Control Sample	103	112	104	100
LCS 410-457437/4	Lab Control Sample	103	109	100	105
MB 410-456568/6	Method Blank	107	107	109	103
MB 410-457095/6	Method Blank	110	114	107	101
MB 410-457437/6	Method Blank	111	109	103	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 410-456568/6
Matrix: Water
Analysis Batch: 456568

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/20/23 21:30	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/20/23 21:30	1
Toluene	ND		1.0	0.30	ug/L			12/20/23 21:30	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/20/23 21:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*12/20/23 21:30*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*12/20/23 21:30*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 120*		*12/20/23 21:30*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*12/20/23 21:30*	*1*

Lab Sample ID: LCS 410-456568/4
Matrix: Water
Analysis Batch: 456568

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.0	21.0		ug/L		105	80 - 120
Ethylbenzene	20.0	21.3		ug/L		107	80 - 120
Toluene	20.0	21.9		ug/L		109	80 - 120
Xylenes, Total	60.0	60.7		ug/L		101	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*
4-Bromofluorobenzene (Surr)	*113*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*115*		*80 - 120*

Lab Sample ID: MB 410-457095/6
Matrix: Water
Analysis Batch: 457095

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/21/23 23:31	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/21/23 23:31	1
Toluene	ND		1.0	0.30	ug/L			12/21/23 23:31	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/21/23 23:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*80 - 120*		*12/21/23 23:31*	*1*
4-Bromofluorobenzene (Surr)	*114*		*80 - 120*		*12/21/23 23:31*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 120*		*12/21/23 23:31*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*12/21/23 23:31*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 410-457095/4
Matrix: Water
Analysis Batch: 457095

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			20.0	21.7		ug/L		108	80 - 120		
Ethylbenzene			20.0	20.7		ug/L		104	80 - 120		
Toluene			20.0	19.6		ug/L		98	80 - 120		
Xylenes, Total			60.0	59.1		ug/L		99	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*
4-Bromofluorobenzene (Surr)	*112*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: 410-155055-B-3 MS
Matrix: Water
Analysis Batch: 457095

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene	ND		20.0	22.2		ug/L		111	81 - 120		
Ethylbenzene	ND		20.0	23.3		ug/L		116	78 - 120		
Toluene	ND		20.0	22.1		ug/L		110	79 - 120		
Xylenes, Total	ND		60.0	66.1		ug/L		110	78 - 120		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*108*		*80 - 120*

Lab Sample ID: 410-155055-C-3 MSD
Matrix: Water
Analysis Batch: 457095

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND		20.0	22.2		ug/L		111	81 - 120	0	30
Ethylbenzene	ND		20.0	23.7		ug/L		119	78 - 120	2	30
Toluene	ND		20.0	22.1		ug/L		111	79 - 120	0	30
Xylenes, Total	ND		60.0	66.4		ug/L		111	78 - 120	0	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
Toluene-d8 (Surr)	*107*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 410-457437/6
Matrix: Water
Analysis Batch: 457437

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.30	ug/L			12/22/23 20:07	1
Ethylbenzene	ND		1.0	0.40	ug/L			12/22/23 20:07	1
Toluene	ND		1.0	0.30	ug/L			12/22/23 20:07	1
Xylenes, Total	ND		1.0	0.40	ug/L			12/22/23 20:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*80 - 120*		*12/22/23 20:07*	*1*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*		*12/22/23 20:07*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*12/22/23 20:07*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*12/22/23 20:07*	*1*

Lab Sample ID: LCS 410-457437/4
Matrix: Water
Analysis Batch: 457437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.0	19.8		ug/L		99	80 - 120
Ethylbenzene	20.0	20.3		ug/L		101	80 - 120
Toluene	20.0	19.2		ug/L		96	80 - 120
Xylenes, Total	60.0	57.8		ug/L		96	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*105*		*80 - 120*

Lab Sample ID: 410-155043-9 MS
Matrix: Water
Analysis Batch: 457437

Client Sample ID: MW-10S-20231214
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	ND		20.0	22.0		ug/L		110	81 - 120
Ethylbenzene	ND		20.0	23.5		ug/L		118	78 - 120
Toluene	ND		20.0	22.4		ug/L		112	79 - 120
Xylenes, Total	ND		60.0	66.7		ug/L		111	78 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 120*
Toluene-d8 (Surr)	*110*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 410-155043-9 MSD
Matrix: Water
Analysis Batch: 457437

Client Sample ID: MW-10S-20231214
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND		20.0	22.3		ug/L		111	81 - 120	1	30
Ethylbenzene	ND		20.0	23.5		ug/L		118	78 - 120	0	30
Toluene	ND		20.0	22.3		ug/L		111	79 - 120	1	30
Xylenes, Total	ND		60.0	66.5		ug/L		111	78 - 120	0	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*109*		*80 - 120*

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 460-950959/1-A
Matrix: Water
Analysis Batch: 951027

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 950959

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.050	0.014	ug/L		12/19/23 11:00	12/19/23 22:25	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/19/23 11:00	12/19/23 22:25	1
Anthracene	ND		0.050	0.025	ug/L		12/19/23 11:00	12/19/23 22:25	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/19/23 11:00	12/19/23 22:25	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/19/23 11:00	12/19/23 22:25	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/19/23 11:00	12/19/23 22:25	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/19/23 11:00	12/19/23 22:25	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/19/23 11:00	12/19/23 22:25	1
Chrysene	ND		0.050	0.030	ug/L		12/19/23 11:00	12/19/23 22:25	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/19/23 11:00	12/19/23 22:25	1
Fluoranthene	ND		0.050	0.039	ug/L		12/19/23 11:00	12/19/23 22:25	1
Fluorene	ND		0.050	0.012	ug/L		12/19/23 11:00	12/19/23 22:25	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/19/23 11:00	12/19/23 22:25	1
Naphthalene	ND		0.20	0.12	ug/L		12/19/23 11:00	12/19/23 22:25	1
Phenanthrene	ND		0.050	0.022	ug/L		12/19/23 11:00	12/19/23 22:25	1
Pyrene	ND		0.050	0.031	ug/L		12/19/23 11:00	12/19/23 22:25	1

Lab Sample ID: LCS 460-950959/4-A
Matrix: Water
Analysis Batch: 951027

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 950959

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	2.00	2.08		ug/L		104	25 - 130
Acenaphthylene	2.00	2.05		ug/L		102	10 - 150
Anthracene	2.00	2.26		ug/L		113	18 - 150
Benzo[a]anthracene	2.00	2.20		ug/L		110	33 - 139
Benzo[a]pyrene	2.00	2.36		ug/L		118	32 - 140
Benzo[b]fluoranthene	2.00	1.91		ug/L		96	34 - 136
Benzo[g,h,i]perylene	2.00	2.35		ug/L		118	20 - 150
Benzo[k]fluoranthene	2.00	1.92		ug/L		96	35 - 150
Chrysene	2.00	2.07		ug/L		103	43 - 134

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 460-950959/4-A
Matrix: Water
Analysis Batch: 951027

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 950959

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dibenz(a,h)anthracene	2.00	2.54		ug/L		127	14 - 150
Fluoranthene	2.00	2.21		ug/L		110	28 - 133
Fluorene	2.00	2.13		ug/L		107	10 - 150
Indeno[1,2,3-cd]pyrene	2.00	2.45		ug/L		123	12 - 145
Naphthalene	2.00	2.10		ug/L		105	26 - 135
Phenanthrene	2.00	2.22		ug/L		111	12 - 141
Pyrene	2.00	1.89		ug/L		94	19 - 134

Lab Sample ID: LCSD 460-950959/5-A
Matrix: Water
Analysis Batch: 951027

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 950959

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acenaphthene	2.00	2.07		ug/L		104	25 - 130	1	30
Acenaphthylene	2.00	2.04		ug/L		102	10 - 150	0	30
Anthracene	2.00	2.27		ug/L		113	18 - 150	0	30
Benzo[a]anthracene	2.00	2.09		ug/L		104	33 - 139	5	30
Benzo[a]pyrene	2.00	2.39		ug/L		120	32 - 140	2	30
Benzo[b]fluoranthene	2.00	1.78		ug/L		89	34 - 136	7	30
Benzo[g,h,i]perylene	2.00	2.51		ug/L		125	20 - 150	6	30
Benzo[k]fluoranthene	2.00	2.10		ug/L		105	35 - 150	9	30
Chrysene	2.00	2.16		ug/L		108	43 - 134	5	30
Dibenz(a,h)anthracene	2.00	2.65		ug/L		132	14 - 150	4	30
Fluoranthene	2.00	2.15		ug/L		107	28 - 133	3	30
Fluorene	2.00	2.19		ug/L		109	10 - 150	3	30
Indeno[1,2,3-cd]pyrene	2.00	2.54		ug/L		127	12 - 145	4	30
Naphthalene	2.00	2.10		ug/L		105	26 - 135	0	30
Phenanthrene	2.00	2.09		ug/L		104	12 - 141	6	30
Pyrene	2.00	1.86		ug/L		93	19 - 134	2	30

Lab Sample ID: MB 460-951416/1-A
Matrix: Water
Analysis Batch: 951508

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 951416

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.050	0.014	ug/L		12/21/23 08:32	12/21/23 13:49	1
Acenaphthylene	ND		0.050	0.015	ug/L		12/21/23 08:32	12/21/23 13:49	1
Anthracene	ND		0.050	0.025	ug/L		12/21/23 08:32	12/21/23 13:49	1
Benzo[a]anthracene	ND		0.050	0.016	ug/L		12/21/23 08:32	12/21/23 13:49	1
Benzo[a]pyrene	ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 13:49	1
Benzo[b]fluoranthene	ND		0.050	0.024	ug/L		12/21/23 08:32	12/21/23 13:49	1
Benzo[g,h,i]perylene	ND		0.050	0.035	ug/L		12/21/23 08:32	12/21/23 13:49	1
Benzo[k]fluoranthene	ND		0.050	0.028	ug/L		12/21/23 08:32	12/21/23 13:49	1
Chrysene	ND		0.050	0.030	ug/L		12/21/23 08:32	12/21/23 13:49	1
Dibenz(a,h)anthracene	ND		0.050	0.020	ug/L		12/21/23 08:32	12/21/23 13:49	1
Fluoranthene	ND		0.050	0.039	ug/L		12/21/23 08:32	12/21/23 13:49	1
Fluorene	ND		0.050	0.012	ug/L		12/21/23 08:32	12/21/23 13:49	1
Indeno[1,2,3-cd]pyrene	ND		0.050	0.036	ug/L		12/21/23 08:32	12/21/23 13:49	1
Naphthalene	ND		0.20	0.12	ug/L		12/21/23 08:32	12/21/23 13:49	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 460-951416/1-A
Matrix: Water
Analysis Batch: 951508

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 951416

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	ND		0.050	0.022	ug/L		12/21/23 08:32	12/21/23 13:49	1
Pyrene	ND		0.050	0.031	ug/L		12/21/23 08:32	12/21/23 13:49	1

Lab Sample ID: LCS 460-951416/2-A
Matrix: Water
Analysis Batch: 951508

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 951416

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	2.00	2.17		ug/L		109	25 - 130
Acenaphthylene	2.00	1.89		ug/L		95	10 - 150
Anthracene	2.00	2.61		ug/L		130	18 - 150
Benzo[a]anthracene	2.00	2.23		ug/L		112	33 - 139
Benzo[a]pyrene	2.00	2.61		ug/L		131	32 - 140
Benzo[b]fluoranthene	2.00	2.52		ug/L		126	34 - 136
Benzo[g,h,i]perylene	2.00	2.11		ug/L		105	20 - 150
Benzo[k]fluoranthene	2.00	2.05		ug/L		103	35 - 150
Chrysene	2.00	2.11		ug/L		106	43 - 134
Dibenz(a,h)anthracene	2.00	2.41		ug/L		120	14 - 150
Fluoranthene	2.00	2.17		ug/L		109	28 - 133
Fluorene	2.00	2.16		ug/L		108	10 - 150
Indeno[1,2,3-cd]pyrene	2.00	2.46		ug/L		123	12 - 145
Naphthalene	2.00	1.95		ug/L		98	26 - 135
Phenanthrene	2.00	2.05		ug/L		103	12 - 141
Pyrene	2.00	2.25		ug/L		113	19 - 134

Lab Sample ID: LCSD 460-951416/3-A
Matrix: Water
Analysis Batch: 951508

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 951416

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acenaphthene	2.00	2.04		ug/L		102	25 - 130	6	30
Acenaphthylene	2.00	1.82		ug/L		91	10 - 150	4	30
Anthracene	2.00	2.34		ug/L		117	18 - 150	11	30
Benzo[a]anthracene	2.00	2.14		ug/L		107	33 - 139	4	30
Benzo[a]pyrene	2.00	2.55		ug/L		128	32 - 140	2	30
Benzo[b]fluoranthene	2.00	2.40		ug/L		120	34 - 136	5	30
Benzo[g,h,i]perylene	2.00	2.07		ug/L		103	20 - 150	2	30
Benzo[k]fluoranthene	2.00	2.01		ug/L		100	35 - 150	2	30
Chrysene	2.00	2.02		ug/L		101	43 - 134	4	30
Dibenz(a,h)anthracene	2.00	2.26		ug/L		113	14 - 150	6	30
Fluoranthene	2.00	2.22		ug/L		111	28 - 133	2	30
Fluorene	2.00	1.98		ug/L		99	10 - 150	8	30
Indeno[1,2,3-cd]pyrene	2.00	2.44		ug/L		122	12 - 145	1	30
Naphthalene	2.00	1.91		ug/L		96	26 - 135	2	30
Phenanthrene	2.00	2.13		ug/L		107	12 - 141	4	30
Pyrene	2.00	2.11		ug/L		106	19 - 134	6	30

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 410-155043-9 MS
Matrix: Water
Analysis Batch: 951508

Client Sample ID: MW-10S-20231214
Prep Type: Total/NA
Prep Batch: 951416

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	0.019	J	2.00	1.93		ug/L		96	25 - 130
Acenaphthylene	ND		2.00	1.74		ug/L		87	10 - 150
Anthracene	ND		2.00	2.38		ug/L		119	18 - 150
Benzo[a]anthracene	ND		2.00	1.94		ug/L		97	33 - 139
Benzo[a]pyrene	ND		2.00	2.18		ug/L		109	32 - 140
Benzo[b]fluoranthene	ND		2.00	2.05		ug/L		102	34 - 136
Benzo[g,h,i]perylene	ND		2.00	1.67		ug/L		84	20 - 150
Benzo[k]fluoranthene	ND		2.00	1.69		ug/L		85	35 - 150
Chrysene	ND		2.00	1.80		ug/L		90	43 - 134
Dibenz(a,h)anthracene	ND		2.00	1.79		ug/L		89	14 - 150
Fluoranthene	ND		2.00	2.05		ug/L		102	28 - 133
Fluorene	ND		2.00	2.05		ug/L		102	10 - 150
Indeno[1,2,3-cd]pyrene	ND		2.00	1.89		ug/L		94	12 - 145
Naphthalene	ND		2.00	1.88		ug/L		94	26 - 135
Phenanthrene	ND		2.00	2.07		ug/L		103	12 - 141
Pyrene	ND		2.00	1.99		ug/L		99	19 - 134

Lab Sample ID: 410-155043-9 MSD
Matrix: Water
Analysis Batch: 951508

Client Sample ID: MW-10S-20231214
Prep Type: Total/NA
Prep Batch: 951416

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acenaphthene	0.019	J	2.00	2.27		ug/L		112	25 - 130	16	30
Acenaphthylene	ND		2.00	2.04		ug/L		102	10 - 150	16	30
Anthracene	ND		2.00	2.64		ug/L		132	18 - 150	10	30
Benzo[a]anthracene	ND		2.00	2.19		ug/L		110	33 - 139	12	30
Benzo[a]pyrene	ND		2.00	2.33		ug/L		116	32 - 140	7	30
Benzo[b]fluoranthene	ND		2.00	2.24		ug/L		112	34 - 136	9	30
Benzo[g,h,i]perylene	ND		2.00	1.73		ug/L		86	20 - 150	3	30
Benzo[k]fluoranthene	ND		2.00	1.80		ug/L		90	35 - 150	6	30
Chrysene	ND		2.00	1.94		ug/L		97	43 - 134	8	30
Dibenz(a,h)anthracene	ND		2.00	1.91		ug/L		95	14 - 150	6	30
Fluoranthene	ND		2.00	2.10		ug/L		105	28 - 133	3	30
Fluorene	ND		2.00	2.28		ug/L		114	10 - 150	11	30
Indeno[1,2,3-cd]pyrene	ND		2.00	2.10		ug/L		105	12 - 145	11	30
Naphthalene	ND		2.00	2.01		ug/L		100	26 - 135	6	30
Phenanthrene	ND		2.00	1.99		ug/L		99	12 - 141	4	30
Pyrene	ND		2.00	2.17		ug/L		109	19 - 134	9	30

GC/MS VOA

Analysis Batch: 456568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-2	MW-3-20231213	Total/NA	Water	8260D	
410-155043-3	MW-13S-20231213	Total/NA	Water	8260D	
410-155043-4	MW-13D-20231213	Total/NA	Water	8260D	
410-155043-5	MW-12S-20231213	Total/NA	Water	8260D	
410-155043-6	MW-12D-20231213	Total/NA	Water	8260D	
MB 410-456568/6	Method Blank	Total/NA	Water	8260D	
LCS 410-456568/4	Lab Control Sample	Total/NA	Water	8260D	

Analysis Batch: 457095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-1	MW-1-20231213	Total/NA	Water	8260D	
MB 410-457095/6	Method Blank	Total/NA	Water	8260D	
LCS 410-457095/4	Lab Control Sample	Total/NA	Water	8260D	
410-155055-B-3 MS	Matrix Spike	Total/NA	Water	8260D	
410-155055-C-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D	

Analysis Batch: 457437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-7	MW-11S-20231214	Total/NA	Water	8260D	
410-155043-8	MW-8S-20231214	Total/NA	Water	8260D	
410-155043-9	MW-10S-20231214	Total/NA	Water	8260D	
410-155043-10	MW-7S-20231214	Total/NA	Water	8260D	
410-155043-11	MW-14S-20231214	Total/NA	Water	8260D	
410-155043-12	MW-4S-20231214	Total/NA	Water	8260D	
410-155043-13	DUP-20231214	Total/NA	Water	8260D	
410-155043-14	FB-20231214	Total/NA	Water	8260D	
410-155043-15	TB-20231214	Total/NA	Water	8260D	
MB 410-457437/6	Method Blank	Total/NA	Water	8260D	
LCS 410-457437/4	Lab Control Sample	Total/NA	Water	8260D	
410-155043-9 MS	MW-10S-20231214	Total/NA	Water	8260D	
410-155043-9 MSD	MW-10S-20231214	Total/NA	Water	8260D	

GC/MS Semi VOA

Prep Batch: 950959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-1	MW-1-20231213	Total/NA	Water	3510C	
410-155043-2	MW-3-20231213	Total/NA	Water	3510C	
410-155043-2 - DL	MW-3-20231213	Total/NA	Water	3510C	
410-155043-3	MW-13S-20231213	Total/NA	Water	3510C	
410-155043-4	MW-13D-20231213	Total/NA	Water	3510C	
410-155043-5	MW-12S-20231213	Total/NA	Water	3510C	
410-155043-6	MW-12D-20231213	Total/NA	Water	3510C	
MB 460-950959/1-A	Method Blank	Total/NA	Water	3510C	
LCS 460-950959/4-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 460-950959/5-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 951027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 460-950959/1-A	Method Blank	Total/NA	Water	8270E SIM	950959
LCS 460-950959/4-A	Lab Control Sample	Total/NA	Water	8270E SIM	950959

GC/MS Semi VOA (Continued)

Analysis Batch: 951027 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 460-950959/5-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	950959

Prep Batch: 951416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-7 - DL	MW-11S-20231214	Total/NA	Water	3510C	
410-155043-7	MW-11S-20231214	Total/NA	Water	3510C	
410-155043-8	MW-8S-20231214	Total/NA	Water	3510C	
410-155043-9	MW-10S-20231214	Total/NA	Water	3510C	
410-155043-10	MW-7S-20231214	Total/NA	Water	3510C	
410-155043-11	MW-14S-20231214	Total/NA	Water	3510C	
410-155043-12	MW-4S-20231214	Total/NA	Water	3510C	
410-155043-12 - DL	MW-4S-20231214	Total/NA	Water	3510C	
410-155043-13 - DL	DUP-20231214	Total/NA	Water	3510C	
410-155043-13	DUP-20231214	Total/NA	Water	3510C	
410-155043-14	FB-20231214	Total/NA	Water	3510C	
MB 460-951416/1-A	Method Blank	Total/NA	Water	3510C	
LCS 460-951416/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 460-951416/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
410-155043-9 MS	MW-10S-20231214	Total/NA	Water	3510C	
410-155043-9 MSD	MW-10S-20231214	Total/NA	Water	3510C	

Analysis Batch: 951465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-1	MW-1-20231213	Total/NA	Water	8270E SIM	950959
410-155043-2	MW-3-20231213	Total/NA	Water	8270E SIM	950959
410-155043-3	MW-13S-20231213	Total/NA	Water	8270E SIM	950959
410-155043-4	MW-13D-20231213	Total/NA	Water	8270E SIM	950959
410-155043-5	MW-12S-20231213	Total/NA	Water	8270E SIM	950959
410-155043-6	MW-12D-20231213	Total/NA	Water	8270E SIM	950959

Analysis Batch: 951508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-7	MW-11S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-8	MW-8S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-9	MW-10S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-10	MW-7S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-11	MW-14S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-12	MW-4S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-13	DUP-20231214	Total/NA	Water	8270E SIM	951416
410-155043-14	FB-20231214	Total/NA	Water	8270E SIM	951416
MB 460-951416/1-A	Method Blank	Total/NA	Water	8270E SIM	951416
LCS 460-951416/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	951416
LCSD 460-951416/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	951416
410-155043-9 MS	MW-10S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-9 MSD	MW-10S-20231214	Total/NA	Water	8270E SIM	951416

Analysis Batch: 951659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-2 - DL	MW-3-20231213	Total/NA	Water	8270E SIM	950959
410-155043-7 - DL	MW-11S-20231214	Total/NA	Water	8270E SIM	951416
410-155043-12 - DL	MW-4S-20231214	Total/NA	Water	8270E SIM	951416

GC/MS Semi VOA (Continued)

Analysis Batch: 951659 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-155043-13 - DL	DUP-20231214	Total/NA	Water	8270E SIM	951416

Lab Chronicle

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Client Sample ID: MW-1-20231213
Lab Sample ID: 410-155043-1
Date Collected: 12/13/23 10:21
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457095	K4WN	ELLE	12/22/23 03:36
Total/NA	Prep	3510C			950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM		1	951465	MDJ	EET EDI	12/21/23 18:57

Client Sample ID: MW-3-20231213
Lab Sample ID: 410-155043-2
Date Collected: 12/13/23 11:31
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	456568	K4WN	ELLE	12/21/23 00:14
Total/NA	Prep	3510C			950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM		1	951465	MDJ	EET EDI	12/21/23 19:18
Total/NA	Prep	3510C	DL		950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM	DL	5	951659	MDJ	EET EDI	12/22/23 14:10

Client Sample ID: MW-13S-20231213
Lab Sample ID: 410-155043-3
Date Collected: 12/13/23 12:59
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	456568	K4WN	ELLE	12/21/23 00:33
Total/NA	Prep	3510C			950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM		1	951465	MDJ	EET EDI	12/21/23 19:39

Client Sample ID: MW-13D-20231213
Lab Sample ID: 410-155043-4
Date Collected: 12/13/23 13:44
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	456568	K4WN	ELLE	12/21/23 00:53
Total/NA	Prep	3510C			950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM		1	951465	MDJ	EET EDI	12/21/23 20:00

Client Sample ID: MW-12S-20231213
Lab Sample ID: 410-155043-5
Date Collected: 12/13/23 14:37
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	456568	K4WN	ELLE	12/21/23 01:13
Total/NA	Prep	3510C			950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM		1	951465	MDJ	EET EDI	12/21/23 20:21

Lab Chronicle

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Client Sample ID: MW-12D-20231213
Lab Sample ID: 410-155043-6
Date Collected: 12/13/23 15:25
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	456568	K4WN	ELLE	12/21/23 01:32
Total/NA	Prep	3510C			950959	OTS	EET EDI	12/20/23 11:12
Total/NA	Analysis	8270E SIM		1	951465	MDJ	EET EDI	12/21/23 20:42

Client Sample ID: MW-11S-20231214
Lab Sample ID: 410-155043-7
Date Collected: 12/14/23 10:00
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/23/23 02:35
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 16:54
Total/NA	Prep	3510C	DL		951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM	DL	5	951659	MDJ	EET EDI	12/22/23 14:30

Client Sample ID: MW-8S-20231214
Lab Sample ID: 410-155043-8
Date Collected: 12/14/23 10:51
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/23/23 02:56
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 17:15

Client Sample ID: MW-10S-20231214
Lab Sample ID: 410-155043-9
Date Collected: 12/14/23 11:50
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/22/23 22:10
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 15:52

Client Sample ID: MW-7S-20231214
Lab Sample ID: 410-155043-10
Date Collected: 12/14/23 13:43
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/23/23 03:17
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 17:35

Lab Chronicle

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Client Sample ID: MW-14S-20231214
Lab Sample ID: 410-155043-11
Date Collected: 12/14/23 14:34
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/23/23 03:37
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 17:56

Client Sample ID: MW-4S-20231214
Lab Sample ID: 410-155043-12
Date Collected: 12/14/23 15:36
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/23/23 03:57
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 18:17
Total/NA	Prep	3510C	DL		951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM	DL	2	951659	MDJ	EET EDI	12/22/23 14:51

Client Sample ID: DUP-20231214
Lab Sample ID: 410-155043-13
Date Collected: 12/14/23 00:00
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/23/23 04:17
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 20:00
Total/NA	Prep	3510C	DL		951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM	DL	5	951659	MDJ	EET EDI	12/22/23 15:12

Client Sample ID: FB-20231214
Lab Sample ID: 410-155043-14
Date Collected: 12/14/23 14:45
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/22/23 21:29
Total/NA	Prep	3510C			951416	AXB	EET EDI	12/21/23 08:32
Total/NA	Analysis	8270E SIM		1	951508	DXD	EET EDI	12/21/23 18:37

Client Sample ID: TB-20231214
Lab Sample ID: 410-155043-15
Date Collected: 12/14/23 00:00
Matrix: Water
Date Received: 12/15/23 18:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457437	K4WN	ELLE	12/22/23 21:50

Laboratory References:

EET EDI = Eurofins Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	43200	01-31-24
Alaska	State	PA00009	06-30-24
Alaska (UST)	State	17-027	02-28-24
Arizona	State	AZ0780	03-12-24
Arkansas DEQ	State	88-00660	08-09-24
California	State	2792	01-31-24
Colorado	State	PA00009	06-30-24
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-24
Delaware (DW)	State	N/A	01-31-24
Florida	NELAP	E87997	06-30-24
Georgia (DW)	State	C048	01-31-24
Hawaii	State	N/A	01-31-24
Illinois	NELAP	200027	01-31-24
Iowa	State	361	03-01-24
Kansas	NELAP	E-10151	10-31-24
Kentucky (DW)	State	KY90088	12-31-23
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-23
Louisiana (All)	NELAP	02055	06-30-24
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-24
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-24
Minnesota	NELAP	042-999-487	12-31-23
Mississippi	State	023	01-31-24
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-25
Nebraska	State	NE-OS-32-17	01-31-24
New Hampshire	NELAP	2730	01-10-24
New Jersey	NELAP	PA011	06-30-24
New York	NELAP	10670	04-01-24
North Carolina (DW)	State	42705	07-31-24
North Carolina (WW/SW)	State	521	12-31-23
North Dakota	State	R-205	01-31-24
Oklahoma	NELAP	9804	08-31-24
Oregon	NELAP	PA200001	09-11-24
Pennsylvania	NELAP	36-00037	01-31-24
Quebec Ministry of Environment and Fight against Climate Change	PALA	1978	09-16-24
Rhode Island	State	LAO00338	12-31-23
South Carolina	State	89002	01-31-24
Tennessee	State	02838	01-31-24
Texas	NELAP	T104704194-23-46	08-31-24
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-24
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-24

Accreditation/Certification Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
West Virginia (DW)	State	9906 C	12-31-23
West Virginia DEP	State	055	07-31-24
Wyoming	State	8TMS-L	01-31-24
Wyoming (UST)	A2LA	0001.01	11-30-24

Laboratory: Eurofins Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Connecticut	State	PH-0818	09-30-24
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	01-01-24
Georgia	State	12028 (NJ)	06-30-24
Massachusetts	State	M-NJ312	06-30-24
New Jersey	NELAP	12028	06-30-24
New York	NELAP	11452	04-01-24
Pennsylvania	NELAP	68-00522	02-29-24
Rhode Island	State	LAO00376	12-30-23
USDA	US Federal Programs	P330-20-00244	05-31-24

Method Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	ELLE
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	EET EDI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET EDI
5030C	Purge and Trap	SW846	ELLE

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET EDI = Eurofins Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Brown and Caldwell
Project/Site: Patchogue, NY

Job ID: 410-155043-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-155043-1	MW-1-20231213	Water	12/13/23 10:21	12/15/23 18:10
410-155043-2	MW-3-20231213	Water	12/13/23 11:31	12/15/23 18:10
410-155043-3	MW-13S-20231213	Water	12/13/23 12:59	12/15/23 18:10
410-155043-4	MW-13D-20231213	Water	12/13/23 13:44	12/15/23 18:10
410-155043-5	MW-12S-20231213	Water	12/13/23 14:37	12/15/23 18:10
410-155043-6	MW-12D-20231213	Water	12/13/23 15:25	12/15/23 18:10
410-155043-7	MW-11S-20231214	Water	12/14/23 10:00	12/15/23 18:10
410-155043-8	MW-8S-20231214	Water	12/14/23 10:51	12/15/23 18:10
410-155043-9	MW-10S-20231214	Water	12/14/23 11:50	12/15/23 18:10
410-155043-10	MW-7S-20231214	Water	12/14/23 13:43	12/15/23 18:10
410-155043-11	MW-14S-20231214	Water	12/14/23 14:34	12/15/23 18:10
410-155043-12	MW-4S-20231214	Water	12/14/23 15:36	12/15/23 18:10
410-155043-13	DUP-20231214	Water	12/14/23 00:00	12/15/23 18:10
410-155043-14	FB-20231214	Water	12/14/23 14:45	12/15/23 18:10
410-155043-15	TB-20231214	Water	12/14/23 00:00	12/15/23 18:10

410-155043 Chain of Custody

nvironme

Chain of Custody Record

	Sampler: MLM	Lab PM: Weyandt, Barbara A	Carrier Tracking No(s):
Mr. James Marolda	Phone:	E-Mail: Barbara Weyandt@et eurofinsus com	State of Origin:
Company: Brown and Caldwell	PWSID:		
Address: 500 North Franklin Turnpike Suite 306	Due Date Requested:		
City: Ramsey	TAT Requested (days): STANDARD		
State, Zip: NJ, 07446	Compliance Project: Δ Yes Δ No		
Phone: 201-574-4713(Tel)	PO #: 153201		
Email: jmarolda@brwncald com	WO #:		
Project Name: Patchogue, NY	Project #: 41002571		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM - 16 PAHs	8260C - BTEX
		Preservation Code:					N	A
MW-2-20231213	12/13/23	1021	G	GW			X	X
MW-3-20231213		1131					X	X
MW-13S-20231213		1259					X	X
MW-13D-20231213		1344					X	X
MW-12S-20231213		1437					X	X
MW-12D-20231213		1525					X	X
MW-11S-20231214	12/14/23	1000	G	GW			X	X
MW-8S-20231214		1051					X	X
MW-16S-20231214 (MS/MSD)		1150					X	X
MW-7S-20231214		1343					X	X
MW-14S-20231214		1434					X	X

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples ar

☐ Return To Client ☐ Disposal By Lab ☐

Deliverable Requested: I, II, III, IV, Other (specify) RC EQuIS

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 12/8/23 1025	Company: Eurofins	Received by:	Date/Time:	
Relinquished by:	Date/Time: 12/15/23 1300	Company:	Received by:	Date/Time: 12/15	
Relinquished by:	Date/Time: 12/15/23 1810	Company: Eurofin	Received by:	Date/Time: 1 07	
Custody Seals Intact: Δ Yes Δ No	Custody Seal No:		Cooler Temperature(s) °C and Other Remarks:		

NO

RO.

Eurofins Lancaster Laboratories Environme

2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

Client Information	Sampler: MLM	Lab PM: Weyandt, Barbara A	Carrier Tracking No(s):
Client Contact: Mr. James Marolda	Phone:	E-Mail: Barbara.Weyandt@et.eurofinsus.com	State of Origin:
Company: Brown and Caldwell	PWSID:		
Address: 500 North Franklin Turnpike Suite 306	Due Date Requested:		
City: Ramsey	TAT Requested (days): STANdard		
State, Zip: NJ, 07446	Compliance Project: Δ Yes Δ No		
Phone: 201-574-4713(Tel)	PO #: 153201		
Email: jmarolda@brwncald.com	WO #:		
Project Name: Patchogue, NY	Project #: 41002571		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM - 16 PAHs	8260C - BTEX
		Preservation Code:					N	A
MW-4S-20231214	12/14/23	1530	G	GW			X	X
DUP-20231214		9999					X	X
FB-20231214		1445		DI			X	X
TB-20231214		LAB						X

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples ar
☐ Return To Client ☐ Disposal By Lab

Deliverable Requested: I, II, III, IV, Other (specify) EQWS

Special Instructions/QC Requirements: BC

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: MLM	Date/Time: 12/15/23 1300	Company	Received by:	Date/Time: 12/15
Relinquished by:	Date/Time: 12/15/23 1810	Company: EUROFIN	Received by:	Date/Time:
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 12/1

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: R.O. R.O.

NJ

410-155043 Chain of Custody

nvironme

Chain of Custody Record

eurofins | Environment Testing

	Sampler: MLM	Lab PM: Weyandt, Barbara A	Carrier Tracking No(s):	COC No: 410-104178-5955 1
Mr. James Marolda	Phone:	E-Mail: Barbara.Weyandt@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: Brown and Caldwell	PWSID:			Job #:
Address: 500 North Franklin Turnpike Suite 306	Due Date Requested:			
City: Ramsey	TAT Requested (days): STANDard			
State, Zip: NJ, 07446	Compliance Project: Δ Yes Δ No			
Phone: 201-574-4713(Tel)	PO #: 153201			
Email: jmarolda@brwncald.com	WO #:			
Project Name: Patchogue, NY	Project #: 41002571			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM - 16 PAHs	8260C - BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	A		
MW-2-20231213	12/13/23	1021	G	GW			X	X	5	
MW-3-20231213		1131					X	X	5	
MW-13S-20231213		1259					X	X	5	
MW-13A-20231213		1344					X	X	5	
MW-12S-20231213		1437					X	X	5	
MW-12A-20231213		1525					X	X	5	
MW-11S-20231214	12/14/23	1000	G	GW			X	X	5	
MW-8S-20231214		1051					X	X	5	
MW-10S-20231214 (MS/MSD)		1150					X	X	5	MS/MSD
MW-7S-20231214		1343					X	X	5	
MW-14S-20231214		1434					X	X	5	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify): RSC EQuIS

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:		Date/Time: 12/8/23 1025	Company: Eurofins	Received by:		Date/Time:	Company:
Relinquished by:		Date/Time: 12/15/23 1300	Company:	Received by:		Date/Time: 12/15/23 1300	Company: Eurofins
Relinquished by:		Date/Time: 12/15/23 1810	Company: Eurofins	Received by:		Date/Time: 12/15/23 1810	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:			Cooler Temperature(s) °C and Other Remarks:		R 0.2 R 0.9	C 0.1 C 0.8

Rev. 06/08/2021

12/27/2023

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: MLM	Lab PM: Weyandt, Barbara A	Carrier Tracking No(s):	COC No: 410-104178-5955 2
Client Contact: Mr. James Marolda	Phone:	E-Mail: Barbara.Weyandt@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: Brown and Caldwell	PWSID:			Job #:
Address: 500 North Franklin Turnpike, Suite 306	Due Date Requested:			
City: Ramsey	TAT Requested (days): STANdard			
State, Zip: NJ, 07446	Compliance Project: Δ Yes Δ No			
Phone: 201-574-4713(Tel)	PO #: 153201			
Email: jmarolda@brwncald.com	WO #:			
Project Name: Patchogue, NY	Project #: 41002571			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM - 16 PAHs	8260C - BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	A		
MW-4S-20231214	12/14/23	1530	G	GW			X	X	5	
DUP-20231214	↓	9999	↓	↓			X	X	5	
FB-20231214	↓	1445	↓	DI			X	X	5	
TB-20231214	↓	LAB	↓	↓				X	2	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify): BC EQWS

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
MLM	12/15/23 1300				
	12/15/23 1810	Eurofins		12/15/23 1300	Eurofins
	Date/Time	Company	Received by	Date/Time	Company
	Date/Time	Company	Received by	12/19/23 1810	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: R: 0.2 C: 0.1 R: 0.9 C: 0.8

NJ

Ver: 06/08/2021

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Weyandt, Barbara A	Carrier Tracking No(s):	COC No: 410-2576901 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Barbara.Weyandt@et.eurofinsus.com	State of Origin: New York	Page: Page 1 of 2
Company: Eurofins Environment Testing Northeast,		Accreditations Required (See note): NELAP New York		Job #: 410-155043-1
Address: 777 New Durham Road	Due Date Requested: 1/2/2024			
City: Edison	TAT Requested (days):			
State, Zip: NJ 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: Patchogue, NY	Project #: 41002571			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)

Other:

Sample Identification Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wewater, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270E_SIM/3510C_LVI 16 PAHs	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-1-20231213 (410-155043-1)	12/13/23	10:21 Eastern		Water			X	2	
MW-3-20231213 (410-155043-2)	12/13/23	11.31 Eastern		Water			X	2	
MW-13S-20231213 (410-155043-3)	12/13/23	12:59 Eastern		Water			X	2	
MW-13D-20231213 (410-155043-4)	12/13/23	13:44 Eastern		Water			X	2	
MW-12S-20231213 (410-155043-5)	12/13/23	14:37 Eastern		Water			X	2	
MW-12D-20231213 (410-155043-6)	12/13/23	15:25 Eastern		Water			X	2	
MW-11S-20231214 (410-155043-7)	12/14/23	10:00 Eastern		Water			X	2	
MW-8S-20231214 (410-155043-8)	12/14/23	10:51 Eastern		Water			X	2	
MW-10S-20231214 (410-155043-9)	12/14/23	11:50 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I II III, IV Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by: Kristi Dunn	12/19/23 1525	ELLET	Brad Bay	12/20/23 10:02	Eurofins
Relinquished by: Brad Bay	12/20/23 1647	Eurofins		12/20/23 1647	ELLET
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:	1.9 2.4/2.5°C 1.7/1.8°C

Ver: 06/08/2021

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Weyandt, Barbara A	Carrier Tracking No(s):	COC No: 410-2576901.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Barbara.Weyandt@et.eurofinsus.com	State of Origin: New York	Page: Page 2 of 2
Company: Eurofins Environment Testing Northeast,		Accreditations Required (See note): NELAP New York		Job #: 410-155043-1
Address: 777 New Durham Road,	Due Date Requested: 1/2/2024			
City: Edison	TAT Requested (days):			
State, Zip: NJ 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: Patchogue, NY	Project #: 41002571			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)
Other:

Sample Identification Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270E_SIM/3510C_LVI 16 PAHs	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-10S-20231214 (410-155043-9MS)	12/14/23	11:50 Eastern	MS	Water			X	2	
MW-10S-20231214 (410-155043-9MSD)	12/14/23	11.50 Eastern	MSD	Water			X	2	
MW-7S-20231214 (410-155043-10)	12/14/23	13:43 Eastern		Water			X	2	
MW-14S-20231214 (410-155043-11)	12/14/23	14.34 Eastern		Water			X	2	
MW-4S-20231214 (410-155043-12)	12/14/23	15:36 Eastern		Water			X	2	
DUP-20231214 (410-155043-13)	12/14/23	Eastern		Water			X	2	
FB-20231214 (410-155043-14)	12/14/23	14:45 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested I, II, III IV Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Kristi Krauss	12/19/23 1525	ELLET		12/20/23 1202	ELLET
2	Board By	12/20/23 1647	ELLET		12/20/23 1647	ELLET
3						

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Brown and Caldwell

Job Number: 410-155043-1

Login Number: 155043
List Number: 1
Creator: Santiago, Nathaniel

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	True	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

Login Sample Receipt Checklist

Client: Brown and Caldwell

Job Number: 410-155043-1

Login Number: 155043
List Number: 2
Creator: Rivera, Kenneth

List Source: Eurofins Edison
List Creation: 12/20/23 08:55 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.5, 1.8°C, IR #9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix C: Data Validator Qualifications

Experience Summary

Jeffrey Davin has 30 years of experience in environmental science, and has expertise in data validation, data quality, data management, laboratory analytical methods, and data analysis. Jeffrey is experienced in the validation and management of environmental chemistry data. He has performed as the group leader of a data management team and as senior scientist for investigations of multiple hazardous waste sites, including impacted aquatic systems, industrial facilities, landfills, and wastewater effluent discharges. He serves as the primary data validator and/or the lead data manager for several Tier I clients.

He is responsible for data validation pursuant to U.S. Environmental Protection Agency (USEPA) Functional Guidelines and provides guidance on data usability. Jeffrey performs data validation efforts in accordance with USEPA regional and individual state guidelines. He is proficient in USEPA-CLP, USEPA-Regional, USEPA SW-846, 40 CFR Part 136, New Jersey Department of Environmental Protection (NJDEP), and New York State Department of Environmental Conservation (NYSDEC) ASP procedures. Jeffrey is also proficient with managing data and providing submittals in a variety of database platforms, including EQuIS, EIM and MS Access.

Jeffrey has held the positions of analytical chemist and project manager at an environmental testing laboratory in the Northeast, where his responsibilities included client relations, laboratory coordinator/technical advisor for all phases of project work, providing analytical and technical support to clients. His analytical chemistry specialties include gas chromatography mass spectrometry (GC/MS) analysis, data generation, and mass spectral interpretation.

Assignment

Data Validator

Education

M.S. Information Management, Syracuse University, Syracuse, NY, 2012

B.A. Biology, SUNY Potsdam, Potsdam, NY, 1992

Experience

30 years

Joined Firm

2023

Relevant Expertise

- *Lead scientist/data validator*
- *Data management group lead*
- *Analytical chemist*

Project Experience

Data Validation, Confidential Client, Lansing, Michigan

Senior Data Validator and Database Manager. Jeffery served as the lead validator and lead database manager for a large automotive manufacturing site. He was responsible for validating the data from numerous samples collected each year, reviewing quality assurance project plan (QAPPs), advising the project team on data quality/technical issues, reviewing and importing laboratory electronic data deliverables (EDDs) into the database, writing data validation reports, updating the database, and generating analytical summaries and custom exports from the database.

Data Validation, Confidential Client, Global Industrial Company

Senior Database Manager. Jeffery served as the lead database manager for a large industrial client portfolio with more than 70 project databases. He was responsible for coordinating the receipt and upload of EDDs and field data deliverables, completing report summary tables with exceedances of regulatory criteria, including statistics on historical data sets, generating data boxes for GIS figures, and coordinating data validation. Jeffrey managed data for numerous samples collected annually with multiple different matrices and diverse analytical methodologies. Additionally, he developed custom automated exports from the database, and coordinated historical data migrations.

Data Validation, Confidential Client, Montana

Senior Data Validator. Jeffery served as the lead validator for a large railroad client portfolio that contained more than 20 sites. He was responsible for facilitating the validation of data from numerous samples collected each year, coordinating validation and database efforts for immediate response to spills and derailments, reviewing and updating QAPPs, advising project teams on data quality/technical issues, writing data validation reports in accordance with the USEPA National Functional Guidelines and Montana DEQ specific guidance, and performing senior review of reports.

Appendix D: Data Usability Summary Report

DATA USABILITY SUMMARY REPORT
Patchogue, NY Site

Client: National Grid
SDGs: 410-155043-1
Laboratory: Eurofins Lancaster Laboratories Environment Testing, Inc.
Site: Patchogue, NY
Date: January 11, 2024

Client Sample ID	Laboratory Sample ID	Date Collected	Matrix
MW-1-20231213	410-155043-1	12/13/2023	Water
MW-3-20231213	410-155043-2	12/13/2023	Water
MW-13S-20231213	410-155043-3	12/13/2023	Water
MW-13D-20231213	410-155043-4	12/13/2023	Water
MW-12S-20231213	410-155043-5	12/13/2023	Water
MW-12D-20231213	410-155043-6	12/13/2023	Water
MW-11S-20231214	410-155043-7	12/14/2023	Water
MW-8S-20231214	410-155043-8	12/14/2023	Water
MW-10S-20231214	410-155043-9	12/14/2023	Water
MW-7S-20231214	410-155043-10	12/14/2023	Water
MW-14S-20231214	410-155043-11	12/14/2023	Water
MW-4S-20231214	410-155043-12	12/14/2023	Water
DUP-20231214	410-155043-13	12/14/2023	Water
FB-20231214	410-155043-14	12/14/2023	Water
TB-20231214	410-155043-15	12/14/2023	Water

Data validation was performed on the analytical data for fifteen (15) samples collected December 13 through December 14, 2023, at the Patchogue site in New York. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for Evaluating Solid Waste Physical/Chemical SW-846 Method" described below.

Specific method references are as follows:

Analysis	Method References
Semivolatile Organic Compounds (SVOCs)	USEPA SW-846 8270E-SIM
Volatile Organic Compounds (VOCs)	USEPA SW-846 8260D

Data were reviewed in accordance with the USEPA National Functional Guidelines (NFGs) listed below and appropriate method specific USEPA Region II Data Validation Standard Operating Procedures (SOPs). The USEPA NFGs were developed for the Contract Laboratory Program (CLP) methods and may not be applicable to the analytical methods and procedures utilized by the laboratory for this data set. Results were also qualified using analytical method criteria and the reviewer's professional judgement where specific guidance was not applicable.

- USEPA. National Functional Guidelines for Superfund Organics Methods Data Review. OLEM 9240.0-51, EPA 540-R-20-005, November 2020
- USEPA. National Functional Guidelines for Superfund Inorganics Methods Data Review. OLEM 9240.0-51, EPA 542-R-20-006, November 2020

- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. OSWER 9240.1-05A-A-P EPA540/R-99/008. October 1999
- USEPA Contract Laboratory Program Region II Data Validation SOPs (HW-22, HW-24)

The following items/criteria were reviewed for this report:

- Data Completeness
- Chain of Custody
- Holding times and sample preservation
- Field Duplicate Accuracy
- Internal Standard Area and RT
- Surrogates
- Laboratory Control Sample (LCS) recoveries
- Matric Spike and Matrix Spike Duplicate Samples
- Method and field blank contamination
- Initial and continuing calibration summaries
- Compound Quantitation
- Reporting Limits
- Sample comments and Quality Control Summaries

Overall Usability Issues:

Overall, the data is acceptable for the intended purposes. All results are usable an no data were rejected. Additionally, minor analytical issues were found with the following data quality indicators resulting in qualified results: field blank, continuing calibration (CCV) and independent calibration verifications (ICV).

Chain of Custody:

- The container count for the following sample did not match what was listed on the Chain-of-Custody (COC): TB-20231214 (410-155043-15). The laboratory received four total containers, while the COC lists two total containers.

Volatile Organic Compounds (VOCs)

Holding Times and Preservation

Samples must be extracted and/or analyzed within method-specific holding times and meet the preservation requirements listed in the following table.

Method	Matrix	Holding Time	Preservation
VOCs by SW-846 8260D	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2

- All samples were received properly preserved and holding times were achieved for all analyses.

Blanks

Quality assurance (QA) blanks (i.e., method, trip, field, or rinse blanks) are prepared to identify and measure contamination which may have been introduced into samples during sample preparation or field sampling procedures.

- All QA/QC blanks were free of contamination.

Surrogates

Surrogate compounds are spiked prior to sample preparation and are used to monitor the overall performance of the analytical method. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

- Surrogates exhibited acceptable recoveries.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Samples

The LCS (and LCSD) and is used to assess the accuracy and precision of the analytical method independent of sample matrix. Percent recoveries and relative percent differences (RPDs) must be within laboratory-established acceptance limits.

- LCS and or LCSD analysis exhibited acceptable recoveries and RPDs.

Matric Spike and Matrix Spike Duplicate (MS/MSD) Samples

Matrix spike/matrix spike duplicate analysis is utilized to assess the accuracy and precision of the method by measuring the effects of interferences caused by the sample matrix. The MS/MSD percent recoveries and relative percent differences (RPDs) must be within laboratory-established acceptance limits.

- The MS/MSD analysis performed on sample MW-10S-20231214 exhibited acceptable recoveries.

Field Duplicate Accuracy

The field duplicate analysis is employed to measure precision in both the field and laboratory. The relative percent difference (RPD) is measured between parent and duplicate sample results. When both results are greater than or equal to five time the reporting limit (RL), a control limit of 30% relative percent difference (RPD) is applied for water samples and 50% RPD for soil samples. When parent and/or duplicate sample results are less than five times the RL, the absolute difference

between the two results is compared to two times the RL for water samples and four times the RL for soil samples.

- DUP-20231214 is the sample duplicate for MW-11S-20231214. All RPDs were within control limits.

Internal Standard Areas

Internal standards are used to monitor instrument performance and ensure instrument sensitivity and response are stable during sample analysis. The internal standard area count must within a (50-200%) range of the associated standard. The retention time of the internal standard must not vary by more than ±10 seconds from the associated continuing calibration standard.

- All samples exhibited acceptable internal standard values and retention times.

Initial Calibration

The initial calibration curve is developed by plotting instrument response of analytes versus the known concentrations of analyte standards, and linearity ensures the instrument can produce quantitative data. The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds. A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99. The RRF control limit is (0.05) or (0.01) for poor responding compounds.

- All recoveries and/or correlation coefficient criteria were met.

Continuing Calibration

The continuing calibration is used to assess calibration drift. A maximum percent difference (%D) of 20% is allowed. The RRF control limit is (0.05) or (0.01) for poor responding compounds.

- ICVs and CCVs were within the specified control limits.

Compound Quantitation and Identification

GC/MS analysis utilizes retention time and mass spectra criteria to identify detected results.

- Identified compounds met the specified criteria.
- All sample detections detected above the MDL and below the RL are appropriately qualified as estimated, J, by the laboratory, reason code T.

System Performance and Overall Assessment

Instrument performance indicators were evaluated, and overall analytical integrity was assessed.

- Mass Spectrometer tuning criteria was within control limits.
- Overall system performance was acceptable.

Semivolatile Organic Compounds (SVOCs)

Holding Times and Preservation

Samples must be extracted and/or analyzed within method-specific holding times and meet the preservation requirements listed in the following table.

Method	Matrix	Holding Time	Preservation
SVOCs by SW-846 8270E	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

- All samples were received properly preserved and holding times were achieved for all analyses.

Blanks

Quality assurance (QA) blanks (i.e., method, trip, field, or rinse blanks) are prepared to identify and measure contamination which may have been introduced into samples during sample preparation or field sampling procedures.

- The field blank (FB-20231214) collected on 12/14/2024 had detections of acenaphthene, fluorene, and phenanthrene. Associated sample analytes less than five times the field blank detections are qualified as follows: detections below the RL are qualified as estimated, UJ, at the RL; detections above the RL are qualified as estimated, UJ, at the sample concentration, reason code 7. Non-detections are not qualified.

Surrogates

Surrogate compounds are spiked prior to sample preparation and are used to monitor the overall performance of the analytical method. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

- Surrogates exhibited acceptable recoveries for all samples.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Samples

The LCS (and LCSD) and is used to assess the accuracy and precision of the analytical method independent of sample matrix. Percent recoveries and relative percent differences (RPDs) must be within laboratory-established acceptance limits.

- LCS and or LCSD analysis exhibited acceptable recoveries and RPDs.

Matrix Spike and Matrix Spike Duplicate (MS/MSD) Samples

Matrix spike/matrix spike duplicate analysis is utilized to assess the accuracy and precision of the method by measuring the effects of interferences caused by the sample matrix. The MS/MSD percent recoveries and relative percent differences (RPDs) must be within laboratory-established acceptance limits.

- The MS/MSD analysis performed on sample MW-10S-20231214 exhibited acceptable recoveries.

Field Duplicate Accuracy

The field duplicate analysis is employed to measure precision in both the field and laboratory. The relative percent difference (RPD) is measured between parent and duplicate sample results. When both results are greater than or equal to five time the reporting limit (RL), a control limit of 30% RPD is applied for water samples and 50% RPD for soil samples. When parent and/or duplicate sample results are less than five times the RL, the absolute difference between the two results is compared to two times the RL for water samples and four times the RL for soil samples.

- DUP-20231214 is the sample duplicate for MW-11S-20231214. All RPDs were within control limits except for anthracene, fluorene, naphthalene and phenanthrene. Parent and duplicate concentrations for associated analyte(s) are qualified as estimated, J, reason code 8.

Internal Standard Areas

Internal standards are used to monitor instrument performance and ensure instrument sensitivity and response are stable during sample analysis. The internal standard area count must within a (50-200%) range of the associated standard. The retention time of the internal standard must not vary by more than ±10 seconds from the associated continuing calibration standard.

- All samples exhibited acceptable internal standard values and retention times.

Initial Calibration

The initial calibration curve is developed by plotting instrument response of analytes versus the known concentrations of analyte standards, and linearity ensures the instrument can produce quantitative data. The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds. A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99. The RRF control limit is (0.05) or (0.01) for poor responding compounds.

- All recoveries and/or correlation coefficient criteria were met.

Continuing Calibration

The continuing calibration is used to assess calibration drift. A maximum percent difference (%D) of 20% is allowed. The RRF control limit is (0.05) or (0.01) for poor responding compounds.

- ICVs and CCVs were within the specified control limits except for analytes presented in the following table.

Method	Sample	Analyte(s)	Exceedance	Qualification	Reason Code
8270E-SIM	MW-1-20231213 MW-3-20231213 MW-13S-20231213 MW-13D-20231213 MW-12S-20231213 MW-12D-20231213	Dibenz(a,h)anthracene	CCV %D > 20% (increase in response)	J (detects) No action (NDs)	SH
	MW-11S-20231214 MW-8S-20231214 MW-10S-20231214 MW-7S-20231214 MW-14S-20231214 MW-4S-20231214 DUP-20231214 FB-20231214 TB-20231214	Phenanthrene	ICV %D > 20% (decrease in response)	J (detects) UJ (non-detects)	SL
		Benzo[a]pyrene	ICV %D > 20% (increase in response)	J (detects) No action (NDs)	SH

Reporting Limits and Compound Quantitation

GC/MS analysis utilizes retention time and mass spectra criteria to identify detected results.

- Identified compounds met the specified criteria.
- All sample detections detected above the MDL and below the RL are appropriately qualified as estimated, J, by the laboratory, reason code T.

System Performance and Overall Assessment

Instrument performance indicators were evaluated, and overall analytical integrity was assessed.

- Mass Spectrometer tuning criteria was within control limits.
- Overall system performance was acceptable.

Signed:  Dated: January 11, 2024 Peer Review: CJS

Jeffrey L. Davin
Senior Validator
Brown and Caldwell

Data Qualifiers

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected above the sample reporting limit; and the reporting limit is approximate.

U = The analyte was analyzed for but was not detected above the method detection limit.

R = The sample results is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

Reason Codes

1	Holding time violation
2	Method blank contamination
3	Surrogate recovery
4	MS/MSD recovery
5	MS/MSD precision outside limits
6	LCS recovery
7	Field blank contamination
8	Field duplicate precision outside limits
9	Other deficiencies (including cooler temperature)
A	Absence of supporting QC
S	ICV, CCV or column performance check problem
Y	Initial and continuing calibration blank problem
M	Interference check samples problem
O	Post digestion spike outside of 85-115%
F	MSA correlation coefficient <0.995, or MSA not done
G	Serial dilution problem
K	DFTPP or BFB tuning problem
Q	Initial calibration problem
X	Internal standard recovery problem
V	Second source standard calibration verification problem
L	Low bias
Z	Retention time problem
N	Counting time error (radionuclide chemistry)
W	Detector instability (radionuclide chemistry)
C	Co-elution of compounds
E	Value exceeds linear calibration range
I	Interferences present during analysis
T	Trace level compound, poor quantitation
P	1C/2C precision outside limits
B	LCS/LCSD precision outside limits
D	Lab Dup/Rep precision outside limits
H	High bias

LABORATORY DATA VERIFICATION AND VALIDATION

Sample Duplicate Comparison

PROJECT INFORMATION

Report Number:	410-155043-1	Project Name/Client:	NG-Patchogue
Project Number:	153021	Laboratory:	Eurofins Lancaster
Project Manager:	Jim Marolda	Task/Purpose of Sampling:	GW sampling

SAMPLE INFORMATION

Parent Sample ID:	MW-11S-20231214	Date/Time:	12/14/23 10:00	Matrix:	WG
Duplicate Sample ID:	DUP-20231214	Date/Time:	12/14/23 0:00	Matrix:	WG

Analytes	Unit	Fraction	Analytical Results[a]		Relative Percent Difference (RPD) Comparison		Difference between results	Reporting Limit (RL) Comparison (If Needed)						Control Limit: Is the difference in sample conc. ≥ 2X either RL?	Actions Required
								MW-11S-20231214			DUP-20231214				
			MW-11S-20231214	DUP-20231214	RPD Limit: 30%[b]	Are both results ≥5X RL[c]		RL	2x RL	5x RL	RL	2x RL	5x RL		
Benzene	UG/L	T	0.31	0.30		No	0.01	1.00	2.0	5.0	1.00	2.00	5.00	No	No further action required
Xylenes, total	UG/L	T	1.0	0.42		No	0.58	1.00	2.0	5.0	1.00	2.00	5.00	No	No further action required
Acenaphthene	UG/L	T	34	30	13%	Yes	4.00	0.25	0.50	1.25	0.25	0.50	1.25		No further action required
Acenaphthylene	UG/L	T	0.49	0.47	4%	Yes	0.02	0.05	0.10	0.25	0.05	0.10	0.25		No further action required
Anthracene	UG/L	T	3.1	1.5	70%	Yes	1.60	0.05	0.10	0.25	0.05	0.10	0.25		Qualify detects/non-detects as estimated, J/UJ
Benzo(a)anthracene	UG/L	T	0.27	0.22		No	0.05	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Benzo(a)pyrene	UG/L	T	0.13	0.1		No	0.03	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Benzo(b)fluoranthene	UG/L	T	0.20	0.14		No	0.06	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Benzo(g,h,i)perylene	UG/L	T	0.080	0.069		No	0.011	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Benzo(k)fluoranthene	UG/L	T	0.054	0.059		No	0.005	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Chrysene	UG/L	T	0.29	0.23		No	0.06	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Fluoranthene	UG/L	T	3.0	2.7	11%	Yes	0.30	0.05	0.10	0.25	0.05	0.10	0.25		No further action required
Fluorene	UG/L	T	7.6	3.5	74%	Yes	4.10	0.05	0.10	0.25	0.05	0.10	0.25		Qualify detects/non-detects as estimated, J/UJ
Indeno(1,2,3-c,d)pyrene	UG/L	T	0.099	0.083		No	0.02	0.05	0.10	0.25	0.05	0.10	0.25	No	No further action required
Naphthalene	UG/L	T	2.4	0.28		No	2.12	0.20	0.40	1.00	0.20	0.40	1.00	Yes	Qualify detects/non-detects as estimated, J/UJ
Phenanthrene	UG/L	T	12	0.27	191%	Yes	11.73	0.25	0.50	1.25	0.05	0.10	0.25		Qualify detects/non-detects as estimated, J/UJ
Pyrene	UG/L	T	3.8	3.4	11%	Yes	0.40	0.05	0.10	0.25	0.05	0.10	0.25		No further action required

[a]Results in red text and italics were below reporting limits. Values are reporting limits for comparison purposes only.

[b]**Relative Percent Difference (RPD)** is a quantitative indicator of quality assurance and quality control (QA/QC) for repeated measurements (i.e. duplicates) where the outcome is expected to be the same. It is calculated using the following equation:

$$RPD = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100$$

[c]When both results are greater than 5X the Reporting Limit (RL) the RPD is calculated. If either result is below 5X the RL, the absolute difference between the two results is compared to 2X the RL.

Appendix E: Evaluation of Potential Impact to River from Site Constituents in Groundwater

Appendix F

Evaluation of Potential Impact to River from Site Constituents in Groundwater Patchogue Former MGP Site Patchogue, New York

As described in the First Quarter 2020 Groundwater Monitoring Report, some potentially MGP-related constituents were detected in the shallow groundwater (i.e., the upper ±18 feet) in the vicinity of the ISS mass during the first groundwater monitoring event following implementation of the site remedy. It is expected these constituents are a result of the short-term disturbance of the subsurface that occurred during implementation of the ISS and, their presence is temporary. Shallow groundwater generally flows from northwest to the south and southeast across the Site toward the Patchogue River (see Figure F-1 for a depiction of shallow groundwater flow). The concentrations of most of the constituents that were detected and potentially mobile in the dissolved phase in groundwater (benzene, ethylbenzene, xylenes and naphthalene) were below surface water quality criteria listed in the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004) that are applicable to the Patchogue River (the portion of the Patchogue River proximal to the Site is classified as a Class C water body per 6 NYCRR Part 897). Therefore, they do not have the potential to impact the river. However, the concentration in groundwater of three potentially mobile constituents (acenaphthene, fluorene and pyrene) were slightly above their respective applicable surface water quality criteria. Although it was not anticipated that these constituent concentrations would result in an impact to surface water quality if they discharged to the river, the following analysis was conducted to confirm this.

An analysis was conducted to assess the potential for discharge of site-related constituents in shallow groundwater to impact water quality in the Patchogue River. The evaluation was conducted by estimating the rate at which a mass of site-related constituents, dissolved in groundwater, may be contributing to the surface water in the Patchogue River (i.e., the mass flux of constituents from groundwater to surface water). This approach is consistent with that described in the document entitled "Groundwater Remediation Strategies Tool" (American Petroleum Institute Publication 4730, December 2003). The equation for calculating the mass flux of a constituent is:

$$mf = \Sigma C_i q_i A_i$$

Where: mf = total mass flux of dissolved constituent from the source (µg/sec)

C_i = concentration of the constituent (µg/mL=µg/cm^3)

q_i = specific discharge through the flow area (cm/sec)

where: $q_i = Ki$, with K= hydraulic conductivity (cm/sec) and i=hydraulic gradient (cm/cm)

A_i = flow area perpendicular to flow (cm^2)

where: $A_i = (L)(b)$, with L=width of constituent plume perpendicular to flow and b=plume thickness

In applying this evaluation to the Site, an estimate of mass flux of a constituent (in µg/sec) was calculated shallow groundwater. The mass flux for the shallow groundwater was calculated across a cross-sectional flow area positioned at the downgradient side of the former MGP site, aligned perpendicular to groundwater flow (which in this case is typically parallel or sub-parallel to the shore line). The vertical dimension of the flow area is equal to the plume thickness (b) within the shallow groundwater. The horizontal dimension of the flow area, L, is equal to the width of the constituent plume, which is based on the isoconcentration contours developed from the results of the March 2020 sampling event (see Figures F-2 through F-4). The concentration of site constituents in the Patchogue River resulting from groundwater discharge was estimated using the following equation:

$$C_R = mf_{sgw}/D_R$$

Where: C_R = Concentration of constituent in the river (µg/L)

mf_{sgw} = Mass flux to the river from shallow groundwater (µg/s)

D_R = Patchogue River volumetric flow (L/s)

To address some of the uncertainties in this evaluation, conservative assumptions were made in the above-described calculations which result in river water concentration estimates that are biased high. These assumptions are as follows:

- The hydraulic gradient (i) of groundwater is variable across the Site and thus, the highest hydraulic gradient value was used in the calculation. The larger the value of i, the greater the calculated value of mass flux.
- The plume thickness (b) was estimated conservatively by using the distance from the top of the water table to the top of the well screen of a deeper well at a well couplet, yet the actual plume thickness may be somewhat less, as site constituents were either not detected or detected at very low levels in the deeper wells positioned adjacent to the river. The larger the value of b, the greater the calculated value of mass flux.
- The river volumetric flow value used to calculate in river concentrations (11.2 ft^3/s or 317 L/s) was derived using a 7Q10 flow analysis (the lowest 7-day average flow that occurs, on average, once every 10 years) for the period April 1, 1958 through March 31, 1968 using data from a USGS river gauging station proximal the Site (USGS 01306000, Patchogue River at Patchogue New York). Thus, it was assumed for this estimate that the flow rate in the river is equal to that during periods of very low flow, and the lower the assumed river flow, the greater the estimated concentration in the river water. For comparison, the mean river flow rate at the same river gauging location using data from 1945 to 1976 is 20.4 ft^3/s (579 L/s). Table F-1 provides the data used to determine the 7Q10 flow in the Patchogue River. Attachment F-1 presents the data plotted on log probability paper and the resultant 7Q10 flow value.

To screen for potential impacts to the river, the estimated concentrations of acenaphthene, fluorene and pyrene were developed using the above-described method and compared to the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004). Listed in the table below are standards and guidance values for acenaphthene, fluorene and pyrene that are applicable to the various classes of fresh water.

Fresh Surface Water Standards and Guidance Values

Substance	Water Class (per 6NYCRR Part 701)	Standard (µg/l)	Guidance Value (µg/l)	Protection for:
Acenaphthene	A, A-S, AA, AA-S, B, C	--	5.3	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	48	Fish survival
	A, A-S, AA, AA-S	20	--	Aesthetics
Fluorene	A, A-S, AA, AA-S	--	50	Drinking water source
	A, A-S, AA, AA-S, B, C	--	0.54	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	4.8	Fish survival
Pyrene	A, A-S, AA, AA-S	--	50	Drinking water source
	A, A-S, AA, AA-S, B, C	--	4.6	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	42	Fish survival

Attachments F-2 through F-4 contain the calculations and results for each of these constituents. The estimated concentrations in the Patchogue River resulting from site groundwater impacts are as follows:

- Acenaphthene = 0.0033 µg/L
- Fluorene = 0.00050 µg/L
- Pyrene = 0.00127 µg/L

These conservatively-estimated (i.e., biased high) concentrations are three orders of magnitude below the surface water standards and guidance values listed above, including the lowest standard applicable to Class C surface waters. Also, the estimated concentration of fluorene is below the analytical laboratory detection limits for this constituent. Based on the evaluation conducted, site-related constituents in shallow groundwater do not impact surface water quality in the Patchogue River.

Tables

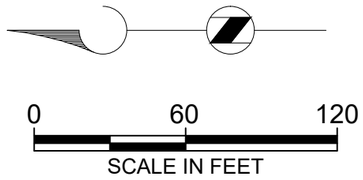
TABLE F-1
SUMMARY OF DATA USED TO CALCULATE 7Q10 FLOW IN PATCHOGUE RIVER
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

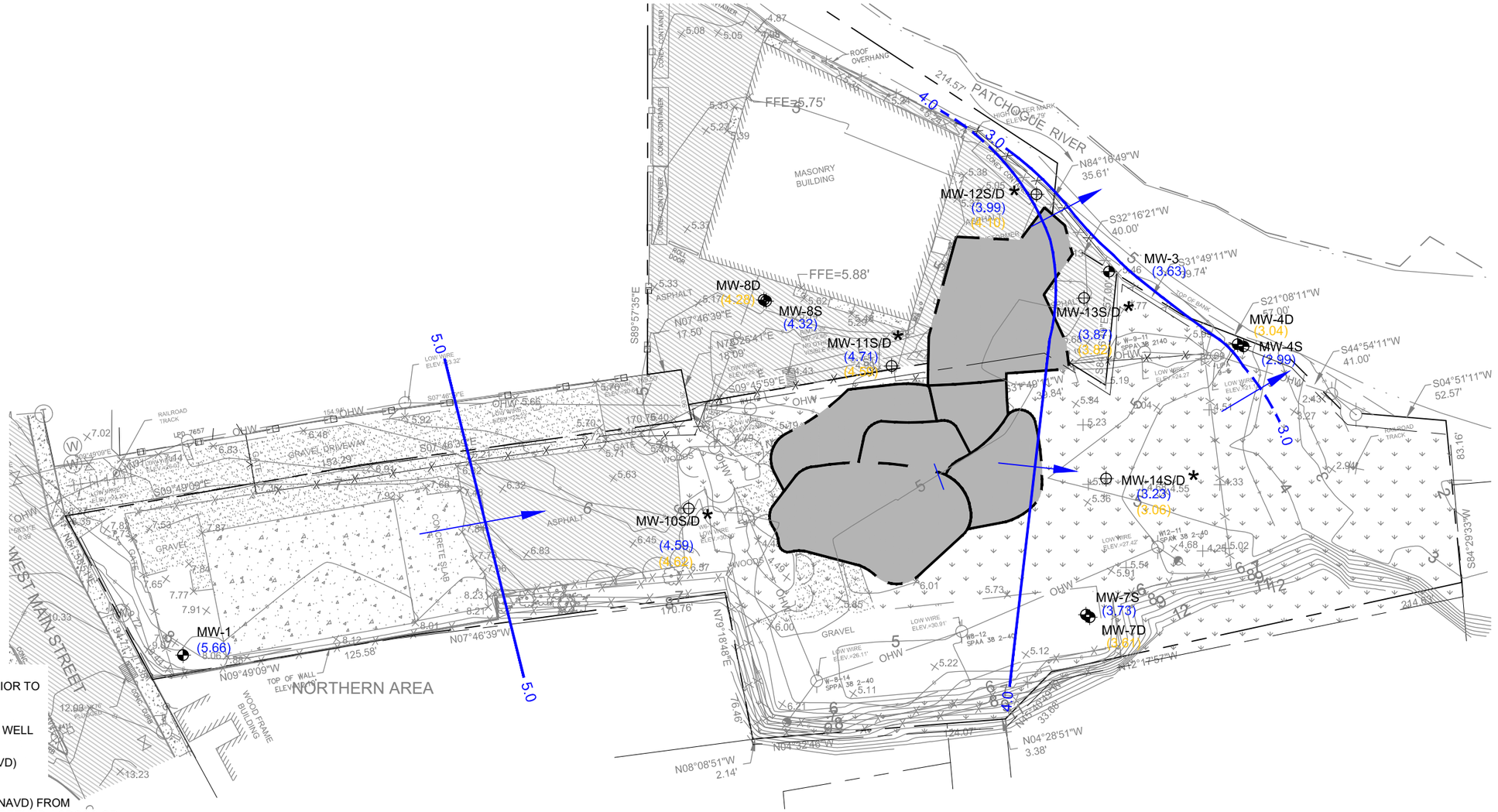
Water Year[(1)]	Low Flow (ft^3/s)	Rank	Probability
1961	20.1	1	0.091
1958	19.1	2	0.182
1960	16.9	3	0.273
1962	16.6	4	0.364
1959	16.0	5	0.455
1967	14.4	6	0.545
1964	13.6	7	0.636
1965	12.9	8	0.727
1963	12.4	9	0.818
1966	11.1	10	0.909

Notes:
(1) - 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through 3/31/1968.

ft^3/s - cubic feet per second

Figures





LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL INSTALLED PRIOR TO REMEDIATION
- POST-REMEDIATION MONITORING WELL
- 4 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- (3.87) — GROUNDWATER ELEVATION (FT., NAVD) FROM SHALLOW MONITORING WELL (SCREENED ACROSS OR CLOSE TO WATER TABLE)
- (3.06) — GROUNDWATER ELEVATION (FT., NAVD) FROM DEEP MONITORING WELL (SCREENED BELOW WATER TABLE). VALUE NOT USED FOR CONTOURING.
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- * — HORIZONTAL LOCATION AND POSTED GROUNDWATER ELEVATION DATA IS APPROXIMATE, AS SURVEYING OF WELLS WILL BE PERFORMED FOLLOWING COMPLETION OF FINAL SITE RESTORATION ACTIVITIES.

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: May 6, 2020

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

WATER TABLE ELEVATION CONTOUR MAP
MARCH 17, 2020

FIGURE

F-1

Path: \\bcusrfp01\Projects\DRAFTING\NATIONAL_GRID\Patchogue\Quarterly-GW-Contour-Map File Name: FIG-1(Mar2020) Plot Date: May 6, 2020 7:32 AM Cadd User: Alan Santiago

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL INSTALLED PRIOR TO REMEDIATION
- POST-REMEDIATION MONITORING WELL
- 4 — WATER TABLE CONTOUR (FT., NAVD) - MARCH 17, 2020 DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 1 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L)
- 12 — ACENAPHTHENE CONCENTRATION IN GROUNDWATER (µg/L) - MARCH 2020
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED

LINE OF CROSS-SECTIONAL AREA FOR MASS FLUX ESTIMATE

MW-1 ND

MW-3 5

MW-4D 0.01J

MW-4S 12

MW-7D ND

MW-7S 0.08

MW-8D ND

MW-8S 0.09

MW-10S/D ND ND

MW-11S/D 56 0.06

MW-12S/D 0.10 ND

MW-13S/D 36 ND

MW-14S/D 0.4 ND

PATCHOGUE RIVER

WEST MAIN STREET

NORTHERN AREA

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell	SCALE: 1" = 60' 153021 DATE: May 6, 2020	NATIONAL GRID PATCHOGUE FORMER MGP SITE VILLAGE OF PATCHOGUE, NEW YORK	ACENAPHTHENE IN GROUNDWATER MARCH 2020

FIGURE

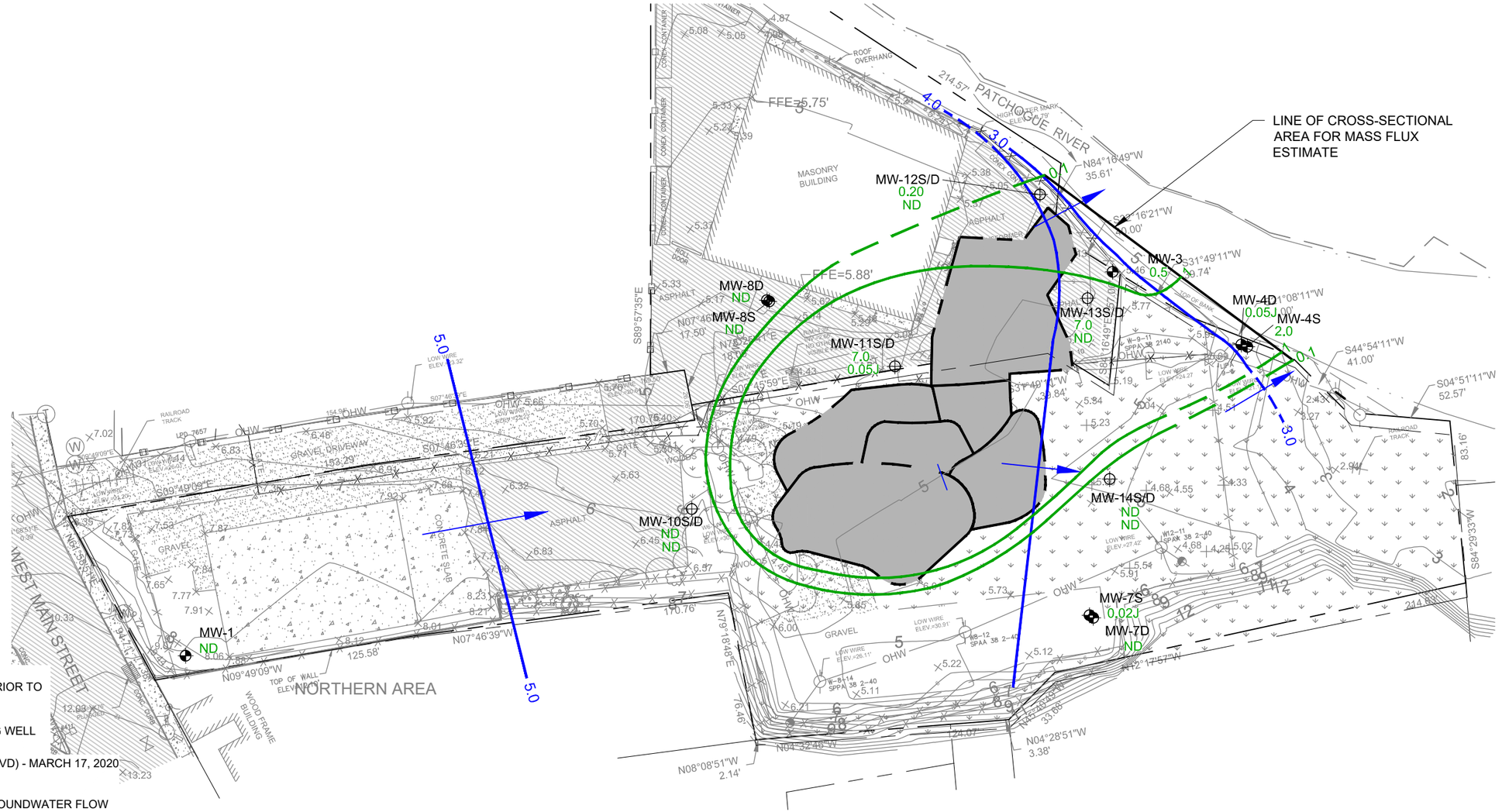
F-2

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL INSTALLED PRIOR TO REMEDIATION
- POST-REMEDIATION MONITORING WELL
- 4 — WATER TABLE CONTOUR (FT., NAVD) - MARCH 17, 2020 DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 1 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L)
- 0.5 — FLUORENE CONCENTRATION IN GROUNDWATER (µg/L) - MARCH 2020
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED



NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: May 6, 2020

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

FLUORENE IN GROUNDWATER MARCH 2020

FIGURE

F-3

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- x x FENCE
- 10 TOPOGRAPHIC CONTOUR
- MONITORING WELL INSTALLED PRIOR TO REMEDIATION
- POST-REMEDIATION MONITORING WELL
- 4 WATER TABLE CONTOUR (FT., NAVD) - MARCH 17, 2020 DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 1 ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L)
- 5.0 PYRENE CONCENTRATION IN GROUNDWATER (µg/L) - MARCH 2020
- J ESTIMATED CONCENTRATION
- ND NOT DETECTED

NOTES:
1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell	SCALE: 1" = 60' 153021 DATE: May 6, 2020	NATIONAL GRID PATCHOGUE FORMER MGP SITE VILLAGE OF PATCHOGUE, NEW YORK	PYRENE IN GROUNDWATER MARCH 2020	FIGURE F-4

Attachments

probability x 2 log cycles

RECURRENCE INTERVAL (yrs)

1.1 2 5 10

99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01

11.2 ft³/s

YEARLY 7 CONSECUTIVE DAY FLOW (ft³/s)

0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99

PROBABILITY OF LARGER FLOW (%)

ATTACHMENT F-2
MASS FLUX CALCULATIONS - ACENAPHTHENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Acenaphthene (March 2020) **Figure No.** See Figure F-2

$mf = kiA * C$

Where:
mf = mass flux, µg/s
k = hydraulic conductivity, cm/s
I = hydraulic gradient, dimensionless
A = cross-sectional area, $cm^{2\,(L * b)}$
C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-1 Contour

						Contour Interval	Geomean	Segment Length	Segment Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	0.1			
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	1	0.32	36	18
C=	0.316227766	µg/L =	0.000316228	µg/cm^3	Geometric mean concentration between selected contours	10	3.16	90	18
L =	36	ft =	1097.28	cm	Length of segment between selected contours [C]	12	10.95	45	18
b =	18	ft =	548.64	cm	Saturated thickness				
mf =	1.5E-02	µg/s	4.8E-01	g/yr	0.00105 lbs/yr				

1-10 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	3.16	µg/L =	0.003162278	µg/cm^3	Geometric mean concentration between selected contours
L =	90	ft =	2743.2	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	3.8E-01	µg/s	1.2E+01	g/yr	0.0262 lbs/yr

10-12 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	10.95	µg/L =	0.010954451	µg/cm^3	Geometric mean concentration between selected contours
L =	45	ft =	1371.6	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	6.5E-01	µg/s	2.1E+01	g/yr	0.045 lbs/yr
mf_{sgw} =	1	µg/s	33	g/yr	0.1 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.0033 µg/L

ATTACHMENT F-3
MASS FLUX CALCULATIONS - FLUORENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Fluorene (March 2020) **Figure No.** See Figure F-3

$mf = kiA * C$

Where:
- mf = mass flux, µg/s
- k = hydraulic conductivity, cm/s
- I = hydraulic gradient, dimensionless
- A = cross-sectional area, $cm^{2\,(L * b)}$
- C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-1 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	**Contour Interval**	**Geomean**
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	0.1	
C=	0.316227766	µg/L =	0.000316228	µg/cm^3	Geometric mean concentration between selected contours	1	0.32
L =	90	ft =	2743.2	cm	Length of segment between selected contours [C]	2	1.41
b =	18	ft =	548.64	cm	Saturated thickness		

Segment Length	**Thickness**
90	18
65	18

mf =	3.8E-02	µg/s	1.2E+00	g/yr	0.00262 lbs/yr

1-2 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	1.41	µg/L =	0.001414214	µg/cm^3	Geometric mean concentration between selected contours
L =	65	ft =	1981.2	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness

mf =	1.2E-01	µg/s	3.8E+00	g/yr	0.0085 lbs/yr
mf_{sgw} =	0	µg/s	5	g/yr	0.0 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
- D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
- mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.00050 µg/L

ATTACHMENT F-4
MASS FLUX CALCULATIONS - PYRENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Pyrene (March 2020) **Figure No.** See Figure F-4

$mf = kiA * C$

Where:
- mf = mass flux, µg/s
- k = hydraulic conductivity, cm/s
- I = hydraulic gradient, dimensionless
- A = cross-sectional area, $cm^{2\,(L * b)}$
- C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-1 Contour

								Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells			0.1			
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours			1	0.32	38	18
C=	0.316227766	µg/L =	0.000316228	µg/cm^3	Geometric mean concentration between selected contours			5	2.24	130	18
L =	38	ft =	1158.24	cm	Length of segment between selected contours [C]						
b =	18	ft =	548.64	cm	Saturated thickness						
mf =	1.6E-02	µg/s	5.0E-01	g/yr	0.00111	lbs/yr					

1-5 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells		
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours		
C=	2.24	µg/L =	0.002236068	µg/cm^3	Geometric mean concentration between selected contours		
L =	130	ft =	3962.4	cm	Length of segment between selected contours [C]		
b =	18	ft =	548.64	cm	Saturated thickness		
mf =	3.9E-01	µg/s	1.2E+01	g/yr	0.0268	lbs/yr	
mf_{sgw} =	0	µg/s	13	g/yr	0.0	lbs/yr	

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
- D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
- mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.00127 µg/L

Appendix G

Evaluation of Potential Impact to River from Site Constituents in Groundwater Patchogue Former MGP Site Patchogue, New York

As described in the Second Quarter 2020 Groundwater Monitoring Report, some potentially MGP-related constituents were detected in the shallow groundwater (i.e., the upper ±18 feet) in the vicinity of the ISS mass during the second groundwater monitoring event following implementation of the site remedy. It is expected these constituents are a result of the disturbance of the subsurface that occurred during implementation of the ISS and, their presence is temporary. Shallow groundwater generally flows from northwest to the south and southeast across the Site toward the Patchogue River (see Figure G-1 for a depiction of shallow groundwater flow). The concentrations of most of the constituents that were detected and potentially mobile in the dissolved phase in groundwater (benzene and ethylbenzene) were below surface water quality criteria listed in the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004) that are applicable to the Patchogue River (the portion of the Patchogue River proximal to the Site is classified as a Class C water body per 6 NYCRR Part 897). Therefore, they do not have the potential to impact the water quality in the river. However, the concentration in groundwater of four potentially mobile constituents (acenaphthene, fluorene, naphthalene and pyrene) were above their respective applicable surface water quality criteria. Although it was not anticipated that these constituent concentrations would result in an impact to surface water quality if they discharged to the river, a mass flux analysis was conducted to confirm this. The concentrations of acenaphthene, fluorene and pyrene in the June 2020 samples were similar (within the same order of magnitude) to those in the March 2020 samples. Since the estimated surface water concentrations of these three constituents based on the mass flux analysis using the March 2020 data (see Appendix F) were three orders of magnitude below applicable surface water criteria, an additional estimation of concentrations of these constituents in the river is not necessary, and the analysis discussed herein was conducted for naphthalene only.

An analysis was conducted to assess the potential for discharge of naphthalene in shallow groundwater to impact water quality in the Patchogue River. The evaluation was conducted by estimating the rate at which a mass of naphthalene, dissolved in groundwater, may be contributing to the surface water in the Patchogue River (i.e., the mass flux of constituents from groundwater to surface water). This approach is consistent with that described in the document entitled "Groundwater Remediation Strategies Tool" (American Petroleum Institute Publication 4730, December 2003). The equation for calculating the mass flux of a constituent is:

$$mf=\Sigma\ C_i q_i A_i$$

Where: mf = total mass flux of dissolved constituent from the source (µg/sec)

C_i = concentration of the constituent (µg/mL=µg/cm^3)

q_i = specific discharge through the flow area (cm/sec)

where: $q_i=Ki$, with K= hydraulic conductivity (cm/sec) and i=hydraulic gradient (cm/cm)

A_i = flow area perpendicular to flow (figure cm^2)

where: $A_i=(L)(b)$, with L=width of constituent plume perpendicular to flow and b=plume thickness

In applying this evaluation to the Site, an estimate of mass flux of a constituent (in µg/sec) was calculated for shallow groundwater. The mass flux for the shallow groundwater was calculated across a cross-sectional flow area positioned at the downgradient side of the former MGP site, aligned perpendicular to groundwater flow (which in this case is typically parallel or sub-parallel to the shore line). The vertical dimension of the flow area is equal to the plume thickness (b) within the shallow groundwater. The horizontal dimension of the flow area, L, is equal to the width of the constituent plume, which is based on the isoconcentration contours developed from the results of the June 2020 sampling event (see Figure G-2). The concentration of site constituents in the Patchogue River resulting from groundwater discharge was estimated using the following equation:

$$C_R=mf_{sgw}/D_R$$

Where: C_R = Concentration of constituent in the river (µg/L)

mf_{sgw} = Mass flux to the river from shallow groundwater (µg/s)

D_R = Patchogue River volumetric flow (L/s)

To address some of the uncertainties in this evaluation, conservative assumptions were made in the above-described calculations which result in river water concentration estimates that are biased high. These assumptions are as follows:

- The hydraulic gradient (i) of groundwater is variable across the Site and thus, the highest hydraulic gradient value was used in the calculation. The larger the value of i, the greater the calculated value of mass flux.
- The plume thickness (b) was estimated conservatively by using the distance from the top of the water table to the top of the well screen of a deeper well at a well couplet, yet the actual plume thickness may be somewhat less, as site constituents were either not detected or detected at very low levels in the deeper wells positioned adjacent to the river. The larger the value of b, the greater the calculated value of mass flux.
- The river volumetric flow value used to calculate in river concentrations (11.2 ft^3/s or 317 L/s) was derived using a 7Q10 flow analysis (the lowest 7-day average flow that occurs, on average, once every 10 years) for the period April 1, 1958 through March 31, 1968 using data from a USGS river gauging station proximal the Site (USGS 01306000, Patchogue River at Patchogue New York). Thus, it was assumed for this estimate that the flow rate in the river is equal to that during periods of very low flow, and the lower the assumed river flow, the greater the estimated concentration in the river water. For comparison, the mean river flow rate at the same river gauging location using data from 1945 to 1976 is 20.4 ft^3/s (579 L/s). Table G-1 provides the data used to determine the 7Q10 flow in the Patchogue River. Attachment G-1 presents the data plotted on log probability paper and the resultant 7Q10 flow value.

To screen for potential impacts to the river, the estimated concentration of naphthalene was calculated using the above-described method and compared to the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004). Listed in the table below are standards and guidance values for naphthalene that are applicable to the various classes of fresh water.

Fresh Surface Water Standards and Guidance Values

Substance	Water Class (per 6NYCRR Part 701)	Standard (µg/l)	Guidance Value (µg/l)	Protection for:
Naphthalene	A, A-S, AA, AA-S, B, C	--	13	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	110	Fish survival
	A, A-S, AA, AA-S	10	--	Aesthetics

Attachment G-2 contains the calculations and results for this constituent. The estimated concentration of naphthalene in the Patchogue River resulting from site groundwater impacts is 0.0197 µg/L. This conservatively-estimated (i.e., biased high) concentration is three orders of magnitude below the surface water standards and guidance values listed above, including the lowest standard applicable to Class C surface waters. Also, the estimated concentration is below the analytical laboratory detection limits for this constituent. Based on the evaluation conducted, site-related constituents in shallow groundwater do not impact surface water quality in the Patchogue River.

Tables

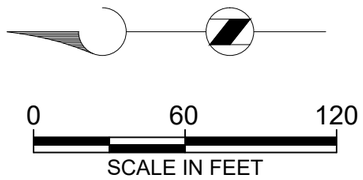
TABLE G-1
SUMMARY OF DATA USED TO CALCULATE 7Q10 FLOW IN PATCHOGUE RIVER
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

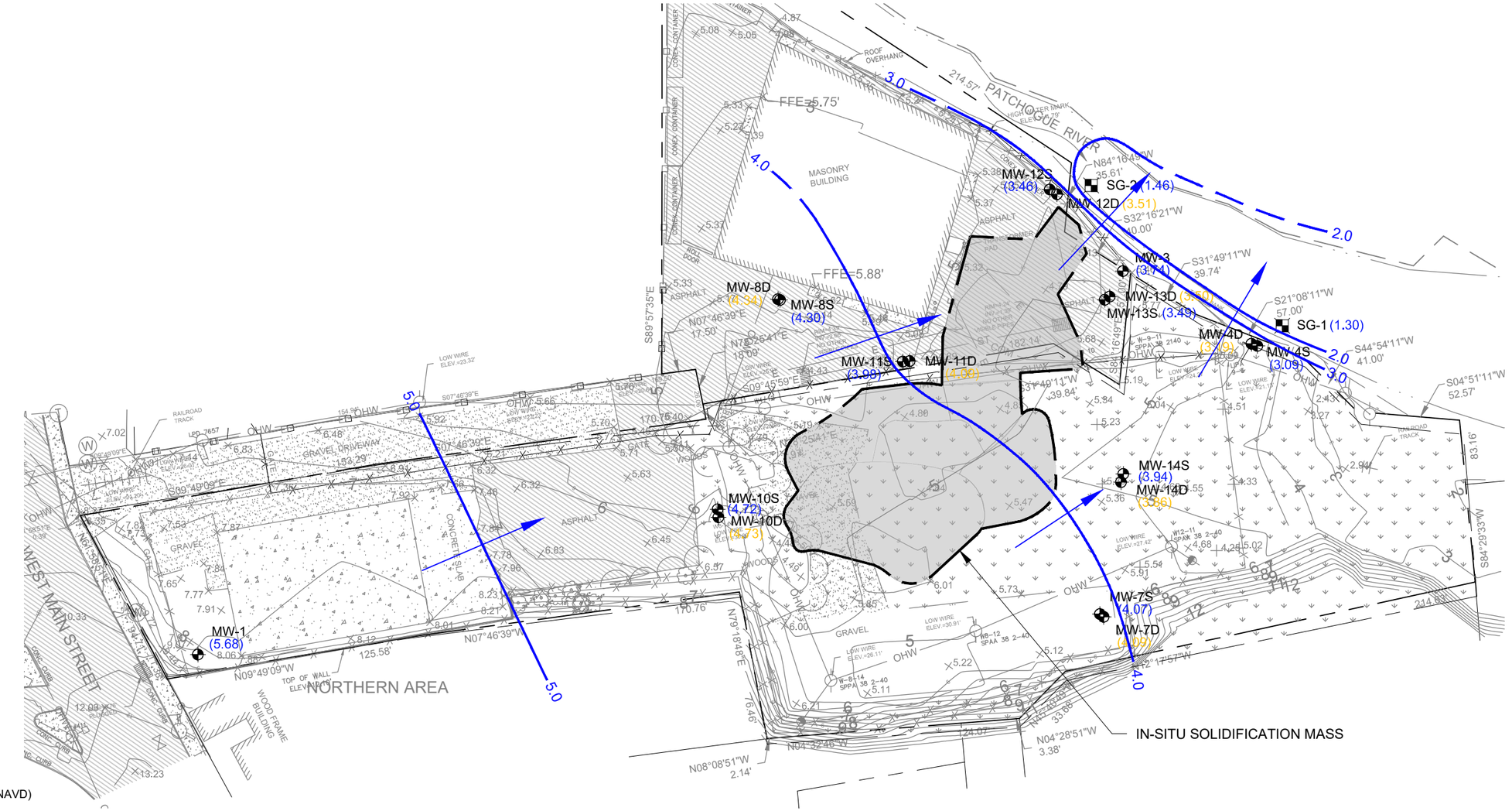
Water Year[(1)]	Low Flow (ft^3/s)	Rank	Probability
1961	20.1	1	0.091
1958	19.1	2	0.182
1960	16.9	3	0.273
1962	16.6	4	0.364
1959	16.0	5	0.455
1967	14.4	6	0.545
1964	13.6	7	0.636
1965	12.9	8	0.727
1963	12.4	9	0.818
1966	11.1	10	0.909

Notes:
(1) - 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through 3/31/1968.

ft^3/s - cubic feet per second

Figures





LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- (4.30) — GROUNDWATER ELEVATION (FT., NAVD) FROM SHALLOW MONITORING WELL (SCREENED ACROSS OR CLOSE TO WATER TABLE) OR RIVER LEVEL FROM STAFF GAUGE (FT., NAVD).
- (4.34) — GROUNDWATER ELEVATION (FT., NAVD) FROM DEEP MONITORING WELL (SCREENED BELOW WATER TABLE). VALUE NOT USED FOR CONTOURING.
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: July 29, 2020

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

WATER TABLE ELEVATION CONTOUR MAP
JUNE 29, 2020

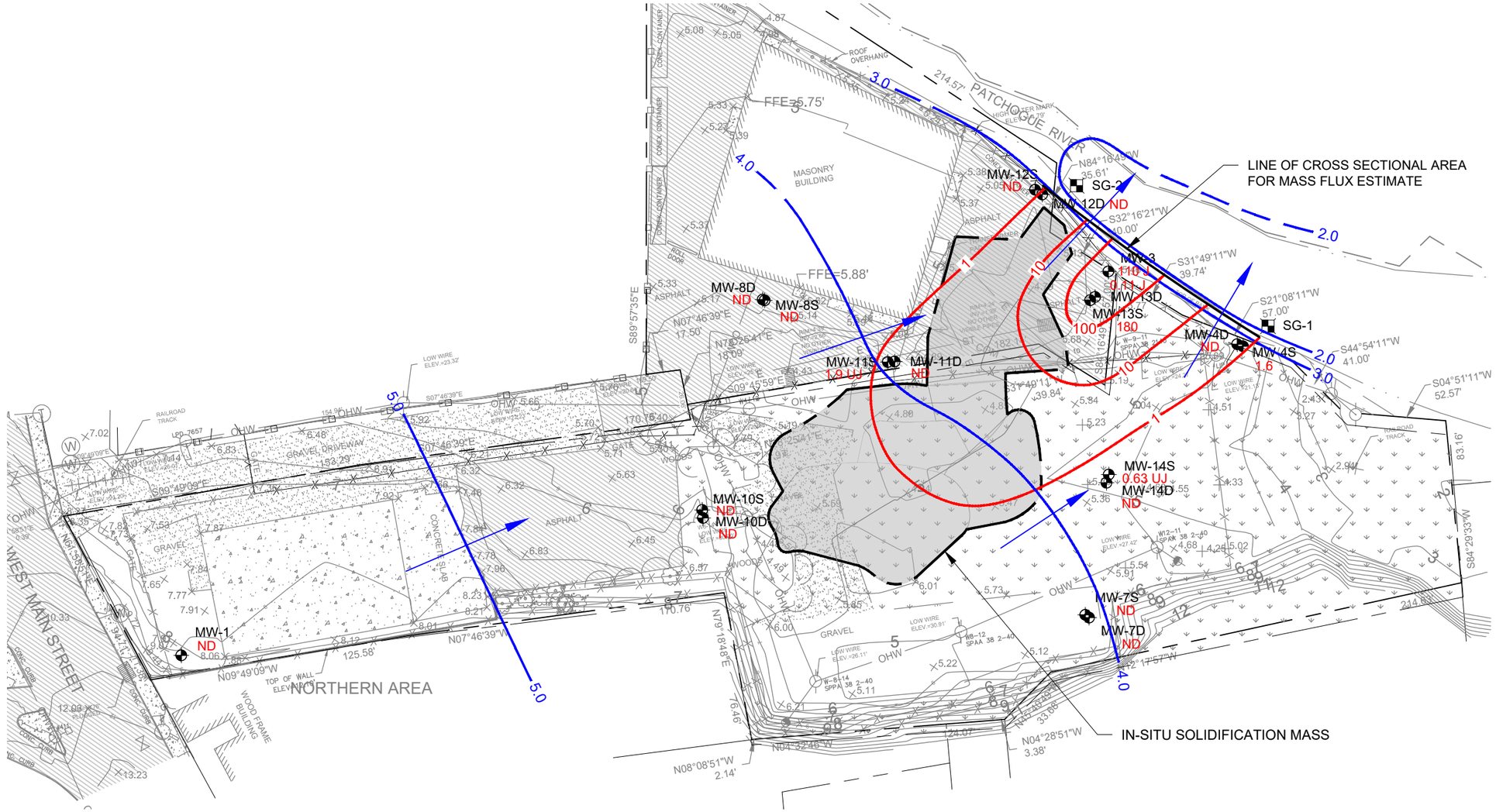
FIGURE

G-1

Path: P:\DRAFTING\NATIONAL_GRID\Patchogue\Quarterly-GW-Contour-Map File Name: FIG-1-(June-2020) Plot Date: September 16, 2020 1:43 PM Cadd User: Robert Near

0 60 120

SCALE IN FEET



LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 10 — ISOCONCENTRATION CONTOUR. LOGARITHMIC CONTOUR INTERVAL (µg/L)
- 1.6 — NAPHTHALENE CONCENTRATION IN GROUNDWATER (µg/L) - JUNE 2020
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: September 11, 2020

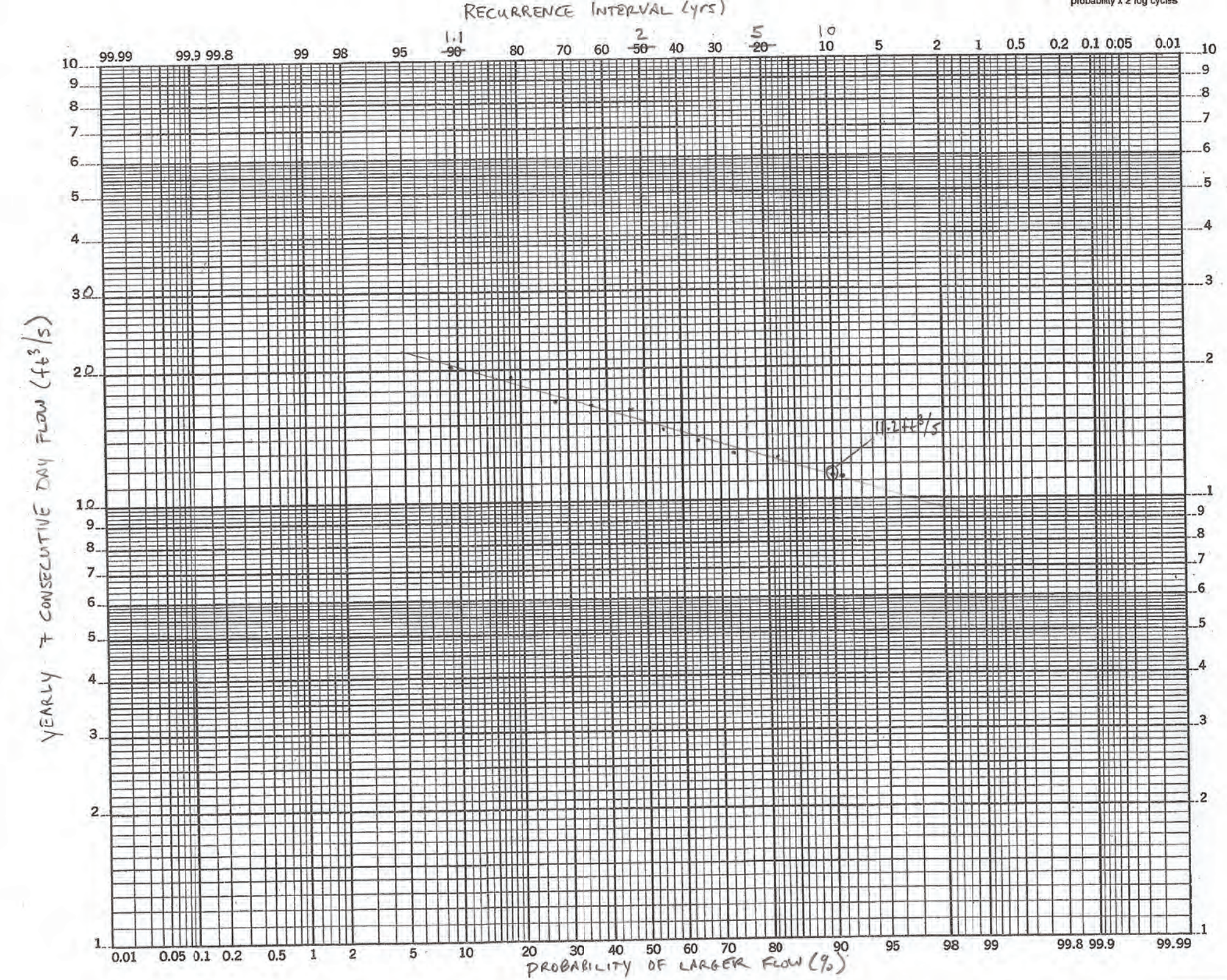
NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

NAPHTHALENE IN GROUNDWATER JUNE 2020

FIGURE

G-2

Attachments


RECURRENCE INTERVAL (yrs)
1.1
2
5
10
99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
YEARLY 7 CONSECUTIVE DAY FLOW (ft³/s)
11.2 ft³/s
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
PROBABILITY OF LARGER FLOW (%)

ATTACHMENT G-2
MASS FLUX CALCULATIONS - NAPHTHALENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Naphthalene (June 2020) **Figure No.** See Figure G-2

$mf = kiA * C$

Where:
mf = mass flux, µg/s
k = hydraulic conductivity, cm/s
I = hydraulic gradient, dimensionless
A = cross-sectional area, $cm^{2\,(L * b)}$
C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

1-10 Contour

						Contour Interval	Geomean	Segment Length	Segment Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells				
i =	0.014	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	1			
C=	3.16	µg/L =	0.00316	µg/cm^3	Geometric mean concentration between selected contours	10	3.16	66	18
L =	66	ft =	2011.68	cm	Length of segment between selected contours [C]	100	31.62	32	18
b =	18	ft =	548.64	cm	Saturated thickness	110	104.88	30	18
mf =	3.0E-01	µg/s	9.4E+00	g/yr	0.02070 lbs/yr				

10-100 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.014	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	31.62	µg/L =	0.0316	µg/cm^3	Geometric mean concentration between selected contours
L =	32	ft =	975.36	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	1.4E+00	µg/s	4.6E+01	g/yr	0.1003 lbs/yr

100-110 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.014	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	104.88	µg/L =	0.105	µg/cm^3	Geometric mean concentration between selected contours
L =	30	ft =	914.4	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	4.5E+00	µg/s	1.4E+02	g/yr	0.312 lbs/yr
mf_{sgw} =	6	µg/s	197	g/yr	0.4 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.0197 µg/L

Appendix E

Evaluation of Potential Impact to River from Site Constituents in Groundwater Patchogue Former MGP Site Patchogue, New York

As described in the Third Quarter 2020 Groundwater Monitoring Report, some potentially MGP-related constituents were detected in the shallow groundwater (i.e., the upper ±18 feet) in the vicinity of the ISS mass during the first groundwater monitoring event following implementation of the site remedy. It is expected these constituents are a result of the short-term disturbance of the subsurface that occurred during implementation of the ISS and, their presence is temporary. Shallow groundwater generally flows from northwest to the south and southeast across the Site toward the Patchogue River (see Figure E-1 for a depiction of shallow groundwater flow). The concentrations of most of the constituents that were detected and potentially mobile in the dissolved phase in groundwater (benzene and ethylbenzene) were below surface water quality criteria listed in the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004) that are applicable to the Patchogue River (the portion of the Patchogue River proximal to the Site is classified as a Class C water body per 6 NYCRR Part 897). Therefore, they do not have the potential to impact the river. However, the concentration of six constituents (acenaphthene, benzo(a)anthracene, fluorene, naphthalene, phenanthrene and pyrene) were detected above their respective applicable surface water quality criteria in downgradient monitoring wells proximal to the river (MW-3 and MW-4S). Although it was not anticipated that these constituent concentrations would result in an impact to surface water quality if they discharged to the river, the following analysis was conducted to confirm this. The concentrations of acenaphthene and naphthalene in the September 2020 samples were similar (within the same order of magnitude) to those in the March and June 2020 samples. Since the estimated surface water concentrations of these two constituents based on the mass flux analysis using the March and June 2020 data were three orders of magnitude below applicable surface water criteria, an additional estimation of concentrations of these constituents in the river is not necessary. However, due to increased concentrations of benzo(a)anthracene, fluorene, phenanthrene and pyrene in MW-3, an additional analysis was conducted for these constituents.

An analysis was conducted to assess the potential for discharge of site-related constituents in shallow groundwater to impact water quality in the Patchogue River. The evaluation was conducted by estimating the rate at which a mass of site-related constituents, dissolved in groundwater, may be contributing to the surface water in the Patchogue River (i.e., the mass flux of constituents from groundwater to surface water). This approach is consistent with that described in the document entitled "Groundwater Remediation Strategies Tool" (American Petroleum Institute Publication 4730, December 2003). The equation for calculating the mass flux of a constituent is:

$$mf = \Sigma C_i q_i A_i$$

Where: mf = total mass flux of dissolved constituent from the source (µg/sec)

C_i = concentration of the constituent (µg/mL=µg/cm^3)

q_i = specific discharge through the flow area (cm/sec)

where: q_i=Ki, with K= hydraulic conductivity (cm/sec) and i=hydraulic gradient (cm/cm)

A_i = flow area perpendicular to flow (cm^2)

where: A_i=(L)(b), with L=width of constituent plume perpendicular to flow and b=plume thickness

In applying this evaluation to the Site, an estimate of mass flux of a constituent (in µg/sec) was calculated shallow groundwater. The mass flux for the shallow groundwater was calculated across a cross-sectional flow area positioned at the downgradient side of the former MGP site, aligned perpendicular to groundwater flow (which in this case is typically parallel or sub-parallel to the shore line). The vertical dimension of the flow area is equal to the plume thickness (b) within the shallow groundwater. The horizontal dimension of the flow area, L, is equal to the width of the constituent plume, which is based on the isoconcentration contours developed from the results of the September 2020 sampling event (see Figures E-2 through E-5). The concentration of site constituents in the Patchogue River resulting from groundwater discharge was estimated using the following equation:

$$C_R = mf_{sgw}/D_R$$

Where: C_R = Concentration of constituent in the river (µg/L)

mf_{sgw} = Mass flux to the river from shallow groundwater (µg/s)

D_R = Patchogue River volumetric flow (L/s)

To address some of the uncertainties in this evaluation, conservative assumptions were made in the above-described calculations which result in river water concentration estimates that are biased high. These assumptions are as follows:

- The hydraulic gradient (i) of groundwater is variable across the Site and thus, the highest hydraulic gradient value was used in the calculation. The larger the value of i, the greater the calculated value of mass flux.
- The plume thickness (b) was estimated conservatively by using the distance from the top of the water table to the top of the well screen of a deeper well at a well couplet, yet the actual plume thickness may be somewhat less, as site constituents were either not detected or detected at very low levels in the deeper wells positioned adjacent to the river. The larger the value of b, the greater the calculated value of mass flux.
- The river volumetric flow value used to calculate in river concentrations (11.2 ft^3/s or 317 L/s) was derived using a 7Q10 flow analysis (the lowest 7-day average flow that occurs, on average, once every 10 years) for the period April 1, 1958 through March 31, 1968 using data from a USGS river gauging station proximal the Site (USGS 01306000, Patchogue River at Patchogue New York). Thus, it was assumed for this estimate that the flow rate in the river is equal to that during periods of very low flow, and the lower the assumed river flow, the greater the estimated concentration in the river water. For comparison, the mean river flow rate at the same river gauging location using data from 1945 to 1976 is 20.4 ft^3/s (579 L/s). Table F-1 provides the data used to determine the 7Q10 flow in the Patchogue River. Attachment F-1 presents the data plotted on log probability paper and the resultant 7Q10 flow value.

To screen for potential impacts to the river, the estimated concentrations of benzo(a)anthracene, fluorene, phenanthrene and pyrene were developed using the above-described method and compared to the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004). Listed in the table below are standards and guidance values for benzo(a)anthracene, fluorene, phenanthrene and pyrene that are applicable to Class C Fresh Water (no standards have been developed for these compounds).

Class C Fresh Surface Water Standards and Guidance Values

Substance	Water Class (per 6NYCRR Part 701)	Standard (µg/l)	Guidance Value (µg/l)	Protection for:
Benzo(a)anthracene	A, A-S, AA, AA-S, B, C	--	0.03	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	0.23	Fish survival
Fluorene	A, A-S, AA, AA-S, B, C	--	0.54	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	4.8	Fish survival
Phenanthrene	A, A-S, AA, AA-S, B, C	--	5.0	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	45	Fish survival
Pyrene	A, A-S, AA, AA-S, B, C	--	4.6	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	42	Fish survival

Attachments E-2 through E-5 contain the calculations and results for each of these constituents. The estimated concentrations in the Patchogue River resulting from site groundwater impacts are as follows:

- Benzo(a)anthracene = 0.0008 µg/L
- Fluorene = 0.003 µg/L
- Phenanthrene = 0.001 µg/L
- Pyrene = 0.007 µg/L

These conservatively-estimated (i.e., biased high) concentrations are below the surface water standards and guidance values listed above, including the lowest standard applicable to Class C surface waters. Also, the estimated concentrations are below the analytical laboratory detection limits for these constituents. Based on the evaluation conducted, site-related constituents in shallow groundwater do not impact surface water quality in the Patchogue River.

Tables

TABLE E-1
SUMMARY OF DATA USED TO CALCULATE 7Q10 FLOW IN PATCHOGUE RIVER
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Water Year[(1)]	Low Flow (ft^3/s)	Rank	Probability
1961	20.1	1	0.091
1958	19.1	2	0.182
1960	16.9	3	0.273
1962	16.6	4	0.364
1959	16.0	5	0.455
1967	14.4	6	0.545
1964	13.6	7	0.636
1965	12.9	8	0.727
1963	12.4	9	0.818
1966	11.1	10	0.909

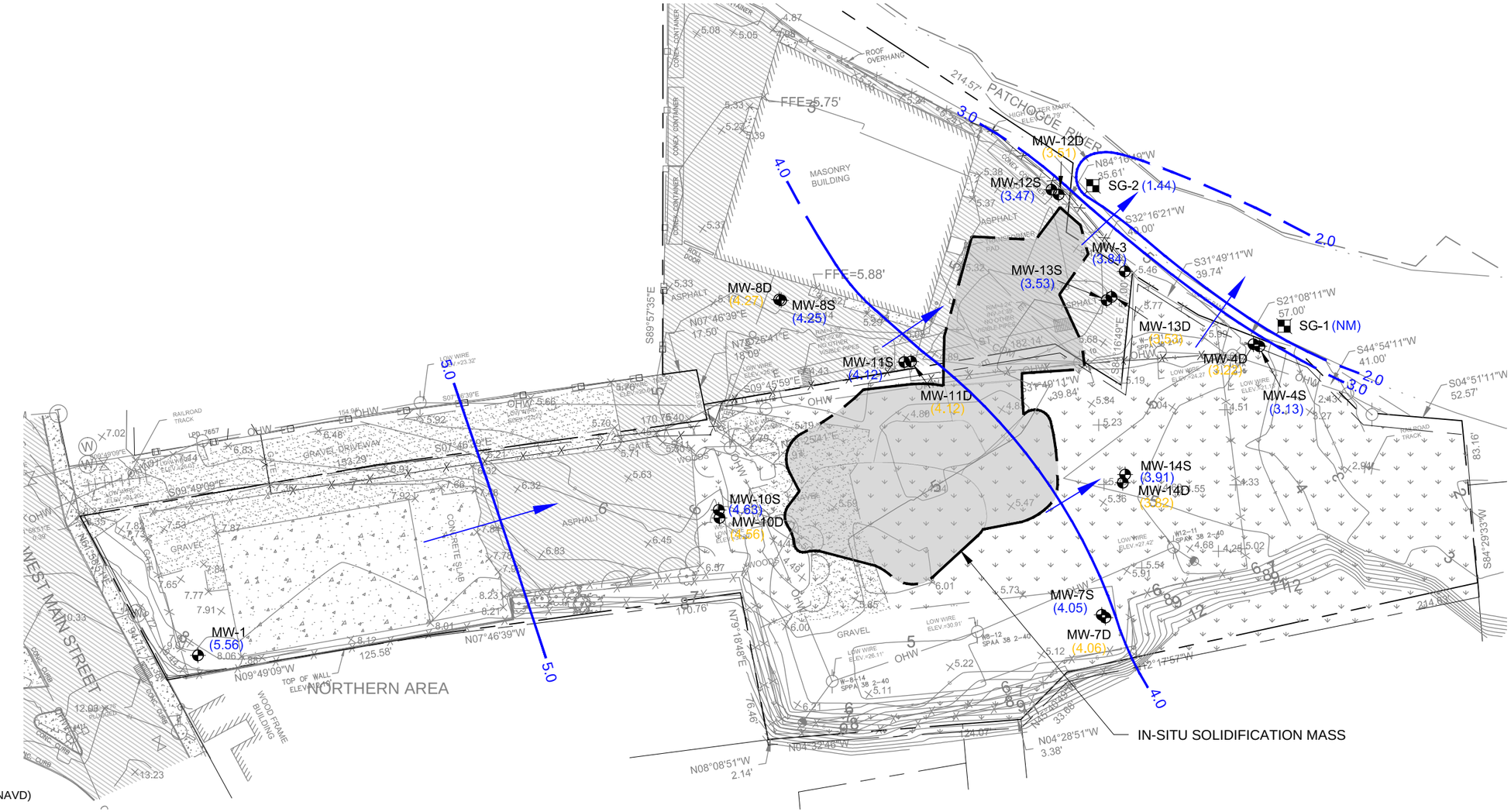
Notes:
(1) - 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through 3/31/1968.

ft^3/s - cubic feet per second

Figures

0 60 120

SCALE IN FEET



LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- (4.30) — GROUNDWATER ELEVATION (FT., NAVD) FROM SHALLOW MONITORING WELL (SCREENED ACROSS OR CLOSE TO WATER TABLE) OR RIVER LEVEL FROM STAFF GAUGE (FT., NAVD).
- (4.34) — GROUNDWATER ELEVATION (FT., NAVD) FROM DEEP MONITORING WELL (SCREENED BELOW WATER TABLE). VALUE NOT USED FOR CONTOURING.
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: July 29, 2020

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

WATER TABLE ELEVATION CONTOUR MAP SEPTEMBER, 2020

FIGURE

E-1

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) - SEPTEMBER 28, 2020 - DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 2.4 — BENZO(a)ANTHRACENE CONCENTRATION IN GROUNDWATER (µg/L) - SEPTEMBER 2020
- ND — NOT DETECTED
- J — ESTIMATED CONCENTRATION
- 1 — ISOCONCENTRATION CONTOUR. LOGARITHMIC CONTOUR INTERVAL (µg/L).

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

LINE OF CROSS-SECTIONAL AREA FOR MASS FLUX ESTIMATE

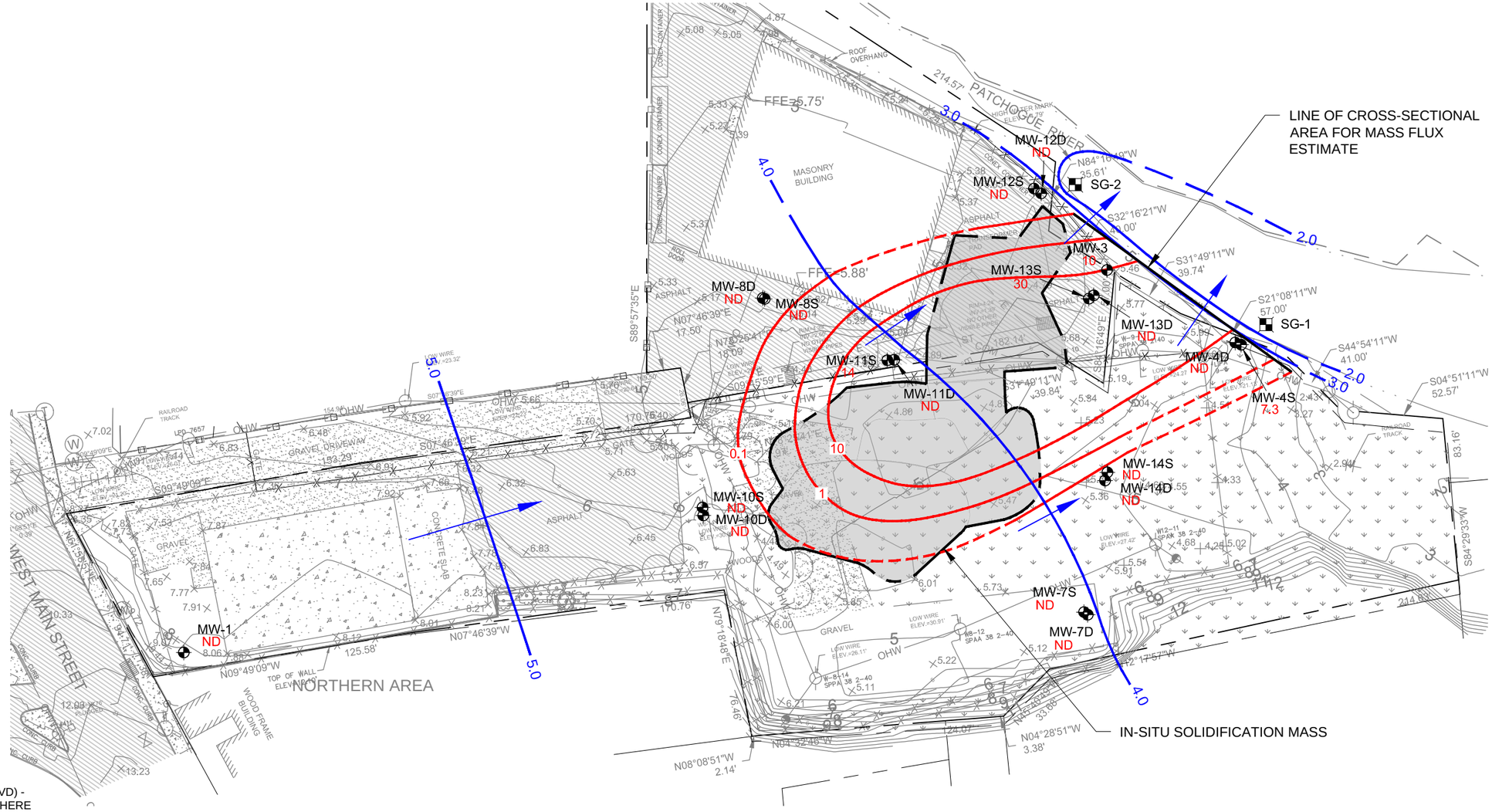
IN-SITU SOLIDIFICATION MASS

NORTHERN AREA

Brown AND Caldwell	SCALE: 1" = 60' 153021 DATE: November 17, 2020	NATIONAL GRID PATCHOGUE FORMER MGP SITE VILLAGE OF PATCHOGUE, NEW YORK	BENZO(a)ANTHRACENE IN GROUNDWATER (µg/L) SEPTEMBER 2020	FIGURE E-2

0 60 120

SCALE IN FEET



LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) - SEPTEMBER 28, 2020 - DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 10 — FLUORENE CONCENTRATION IN GROUNDWATER (µg/L) - SEPTEMBER 2020
- ND — NOT DETECTED
- 10 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L).

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: November 17, 2020

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

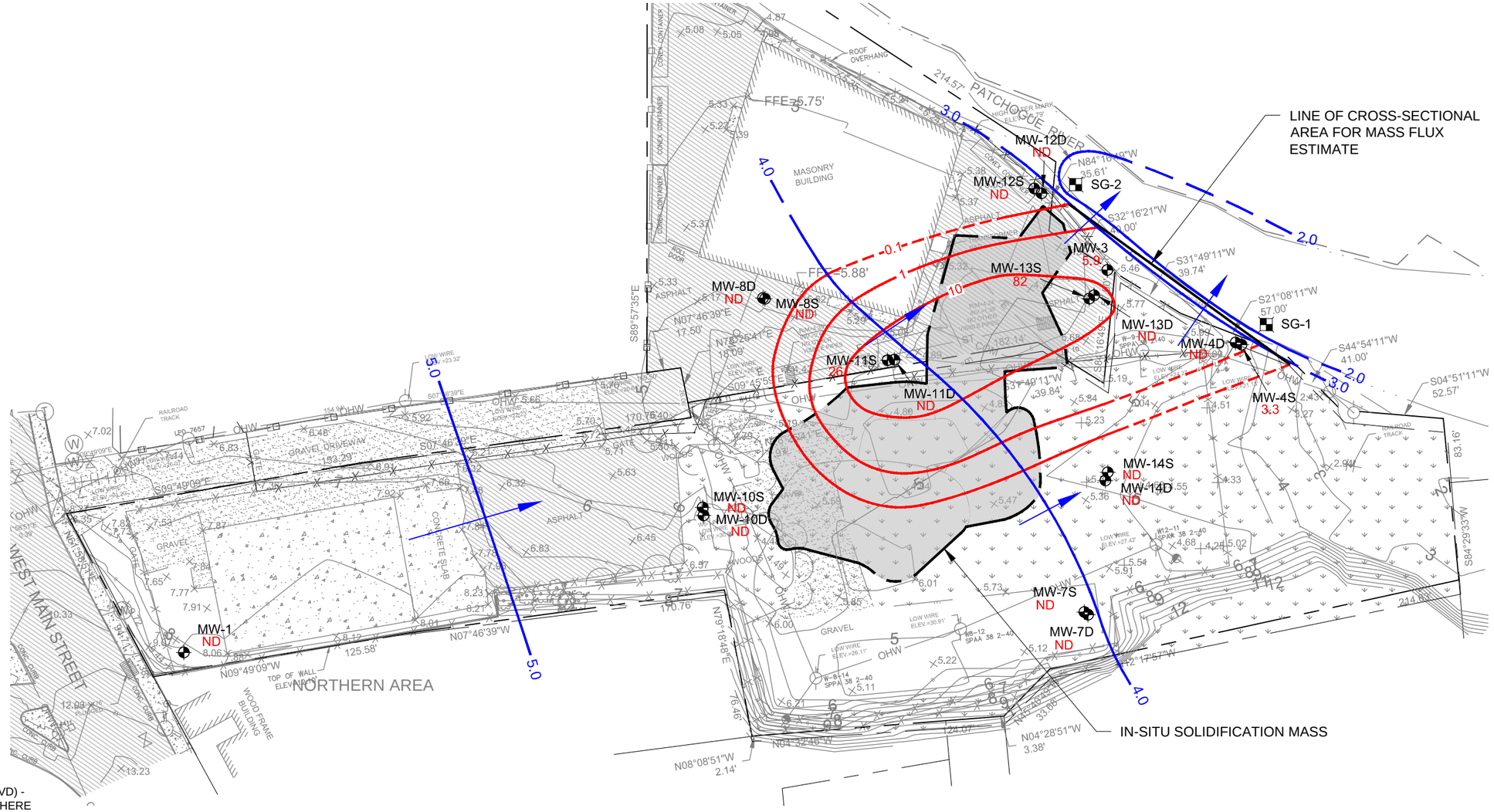
FLUORENE IN GROUNDWATER (µg/L) SEPTEMBER 2020

FIGURE

E-3

0 60 120

SCALE IN FEET



LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) - SEPTEMBER 28, 2020 - DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 5.9 — PHENANTHRENE CONCENTRATION IN GROUNDWATER (µg/L) - SEPTEMBER 2020
- ND — NOT DETECTED
- 10 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L).

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: November 17, 2020

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

PHENANTHRENE IN GROUNDWATER (µg/L) SEPTEMBER 2020

FIGURE

E-4

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- FENCE
- TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) - SEPTEMBER 28, 2020 - DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- 17 — PYRENE CONCENTRATION IN GROUNDWATER (µg/L) - SEPTEMBER 2020
- ND — NOT DETECTED
- 10 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L).

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM TETRA TECH EC, INC. DRAWING ENTITLED "CONCEPTUAL SITE MODEL", DATED DECEMBER 17, 2008.

LINE OF CROSS-SECTIONAL AREA FOR MASS FLUX ESTIMATE

IN-SITU SOLIDIFICATION MASS

NORTHERN AREA

Brown AND Caldwell	SCALE: 1" = 60' 153021 DATE: November 17, 2020	NATIONAL GRID PATCHOGUE FORMER MGP SITE VILLAGE OF PATCHOGUE, NEW YORK	PYRENE IN GROUNDWATER (µg/L) SEPTEMBER 2020	FIGURE E-5

Attachments

probability x 2 log cycles

RECURRENCE INTERVAL (yrs)

1.1 2 5 10

99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01

11.2 ft³/s

YEARLY 7 CONSECUTIVE DAY FLOW (ft³/s)

0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99

PROBABILITY OF LARGER FLOW (%)

ATTACHMENT E-2
MASS FLUX CALCULATIONS - BENZO(A)ANTHRACENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Benzon(a)anthracene (September 2020) **Figure No.** See Figure E-2

mf = kiA * C
Where:
mf = mass flux, µg/s
k = hydraulic conductivity, cm/s
I = hydraulic gradient, dimensionless
A = cross-sectional area, $cm^{2\ (L * b)}$
C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-1 Contour

						Contour Interval		Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	0.1			
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours				
C=	0.316227766	µg/L =	0.000316228	µg/cm^3	Geometric mean concentration between selected contours	1	0.32	34	18
L =	34	ft =	1036.32	cm	Length of segment between selected contours [C]	4.8	2.19	80	18
b =	18	ft =	548.64	cm	Saturated thickness				
mf =	1.4E-02	µg/s	4.5E-01	g/yr	0.00099 lbs/yr				

1-4.8 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	2.19	µg/L =	0.00219089	µg/cm^3	Geometric mean concentration between selected contours
L =	80	ft =	2438.4	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	2.3E-01	µg/s	7.3E+00	g/yr	0.0161 lbs/yr
mf_{sgw} =	0.25	µg/s	7.8	g/yr	0.017 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.0008 µg/L

ATTACHMENT E-3
MASS FLUX CALCULATIONS - FLUORENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Fluorene (September 2020) **Figure No.** See Figure E-3

mf = kiA * C
Where:
mf = mass flux, µg/s
k = hydraulic conductivity, cm/s
I = hydraulic gradient, dimensionless
A = cross-sectional area, $cm^{2\,(L * b)}$
C = (µg/L)/1000=$µg/cm^3$

Shallow Groundwater Flux

0.1-1 Contour

						Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	0.1			
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	1	0.32	32	18
C=	0.316227766	µg/L =	0.000316228	$µg/cm^3$	Geometric mean concentration between selected contours	10	3.16	46	18
L =	32	ft =	975.36	cm	Length of segment between selected contours [C]	10	10.00	60	18
b =	18	ft =	548.64	cm	Saturated thickness				
mf =	1.3E-02	µg/s	4.2E-01	g/yr	0.00093 lbs/yr				

1-10 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	3.16	µg/L =	0.003162278	$µg/cm^3$	Geometric mean concentration between selected contours
L =	46	ft =	1402.08	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	1.9E-01	µg/s	6.1E+00	g/yr	0.0134 lbs/yr

10-10 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	10.00	µg/L =	0.01	$µg/cm^3$	Geometric mean concentration between selected contours
L =	60	ft =	1828.8	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	8.0E-01	µg/s	2.5E+01	g/yr	0.0552 lbs/yr
mf_{sgw} =	1.0	µg/s	32	g/yr	0.070 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.003 µg/L

ATTACHMENT E-4
MASS FLUX CALCULATIONS - PHENANTHRENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Phenanthrene (September 2020) **Figure No.** See Figure E-4

mf = kiA * C
Where:
mf = mass flux, µg/s
k = hydraulic conductivity, cm/s
I = hydraulic gradient, dimensionless
A = cross-sectional area, $cm^{2\,(L * b)}$
C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-1 Contour

						Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	0.1			
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	1	0.32	38	18
C=	0.316227766	µg/L =	0.000316228	µg/cm^3	Geometric mean concentration between selected contours	5.9	2.43	107	18
L =	38	ft =	1158.24	cm	Length of segment between selected contours [C]				
b =	18	ft =	548.64	cm	Saturated thickness				
mf =	1.6E-02	µg/s	5.0E-01	g/yr	0.00111 lbs/yr				

1-5.9 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	2.43	µg/L =	0.002428992	µg/cm^3	Geometric mean concentration between selected contours
L =	107	ft =	3261.36	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	3.4E-01	µg/s	1.1E+01	g/yr	0.0239 lbs/yr
mf_{sgw} =	0.36	µg/s	11	g/yr	0.025 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.001 µg/L

ATTACHMENT E-5
MASS FLUX CALCULATIONS - PYRENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Pyrene (September 2020) **Figure No.** See Figure E-5

$mf = kiA * C$

Where:
- mf = mass flux, µg/s
- k = hydraulic conductivity, cm/s
- I = hydraulic gradient, dimensionless
- A = cross-sectional area, $cm^{2\,(L * b)}$
- C = $(\mu g/L)/1000 = \mu g/cm^3$

Shallow Groundwater Flux

0.1-1 Contour

							Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells		0.1			
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours		1	0.32	19	18
C=	0.316227766	µg/L =	0.000316228	$\mu g/cm^3$	Geometric mean concentration between selected contours		10	3.16	45	18
L =	19	ft =	579.12	cm	Length of segment between selected contours [C]		35	18.71	85	18
b =	18	ft =	548.64	cm	Saturated thickness					
mf =	8.0E-03	µg/s	2.5E-01	g/yr	0.00055	lbs/yr				

1-10 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	
C=	3.16	µg/L =	0.003162278	$\mu g/cm^3$	Geometric mean concentration between selected contours	
L =	45	ft =	1371.6	cm	Length of segment between selected contours [C]	
b =	18	ft =	548.64	cm	Saturated thickness	
mf =	1.9E-01	µg/s	6.0E+00	g/yr	0.0131	lbs/yr

1-35 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	
i =	0.013	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	
C=	18.71	µg/L =	0.018708287	$\mu g/cm^3$	Geometric mean concentration between selected contours	
L =	85	ft =	2590.8	cm	Length of segment between selected contours [C]	
b =	18	ft =	548.64	cm	Saturated thickness	
mf =	2.1E+00	µg/s	6.7E+01	g/yr	0.1464	lbs/yr
mf_{sgw} =	2.3	µg/s	73	g/yr	0.16	lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
- D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
- mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.007 µg/L

Appendix E

Evaluation of Potential Impact to River from Site Constituents in Groundwater Patchogue Former MGP Site Patchogue, New York

As described in the Fourth Quarter 2020 Groundwater Monitoring Report, some potentially MGP-related constituents were detected in the shallow groundwater (i.e., the upper ±18 feet) in the vicinity of the ISS mass during the December 2020 sampling event. It is expected these constituents are a result of the short-term disturbance of the subsurface that occurred during implementation of the ISS and, their presence is temporary. Shallow groundwater generally flows from northwest to the south and southeast across the Site toward the Patchogue River (see Figure E-1 for a depiction of shallow groundwater flow). The concentrations of some of the constituents that were detected and potentially mobile in the dissolved phase in groundwater (benzene and ethylbenzene) were below surface water quality criteria listed in the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004) that are applicable to the Patchogue River (the portion of the Patchogue River proximal to the Site is classified as a Class C water body per 6 NYCRR Part 897). Therefore, they do not have the potential to impact the river. However, the concentration of one or more of seven constituents -- acenaphthene, benzo(a)anthracene, benzo(a)pyrene, fluorene, naphthalene, phenanthrene, and pyrene -- were detected above their respective applicable surface water quality criteria in downgradient monitoring wells proximal to the river (MW-3 and MW-4S). Although it was not anticipated that these constituent concentrations would result in an impact to surface water quality if they discharged to the river, the following analysis was conducted to confirm this. The concentrations of acenaphthene, benzo(a)anthracene, fluorene, naphthalene, and pyrene in the December 2020 samples were similar (within the same order of magnitude) to those in the March, June, and September 2020 samples. Since the estimated surface water concentrations of these five constituents based on the mass flux analyses using the March, June, and September 2020 data were below applicable surface water criteria, an additional estimation of concentrations of these constituents in the river is not necessary. However, due to increased concentrations of benzo(a)pyrene and phenanthrene in MW-3 in the December 2020 samples, an additional analysis was conducted for these constituents.

An analysis was conducted to assess the potential for discharge of site-related constituents in shallow groundwater to impact water quality in the Patchogue River. Noteworthy is that including benzo(a)pyrene in this evaluation is a very conservative measure in that benzo(a)pyrene has a very low aqueous solubility, is not readily mobile in groundwater, and is unlikely to have migrated from the on-Site source area, Moreover, the detection of this constituent in the monitoring locations is likely related to the disturbance of fine or colloid sized particles during purging or sampling activities. These particles are derived from within the well or the soil adjacent to the well that become suspended into the water column of the well as a result of disturbance during purging and sampling activities.

The evaluation was conducted by estimating the rate at which a mass of site-related constituents, dissolved in groundwater, may be contributing to the surface water in the Patchogue River (i.e., the mass flux of constituents from groundwater to surface water). This approach is consistent with that described

in the document entitled "Groundwater Remediation Strategies Tool" (American Petroleum Institute Publication 4730, December 2003). The equation for calculating the mass flux of a constituent is:

$$mf=\Sigma C_i q_i A_i$$

Where: mf = total mass flux of dissolved constituent from the source (µg/sec)

C_i = concentration of the constituent (µg/mL=µg/cm^3)

q_i = specific discharge through the flow area (cm/sec)

where: $q_i=Ki$, with K= hydraulic conductivity (cm/sec) and i=hydraulic gradient (cm/cm)

A_i = flow area perpendicular to flow (cm^2)

where: $A_i=(L)(b)$, with L=width of constituent plume perpendicular to flow and b=plume thickness

In applying this evaluation to the Site, an estimate of mass flux of a constituent (in µg/sec) was calculated for shallow groundwater. The mass flux for the shallow groundwater was calculated across a cross-sectional flow area positioned at the downgradient side of the former MGP site, aligned perpendicular to groundwater flow (which in this case is typically parallel or sub-parallel to the shore line). The vertical dimension of the flow area is equal to the plume thickness (b) within the shallow groundwater. The horizontal dimension of the flow area, L, is equal to the width of the constituent plume, which is based on the isoconcentration contours developed from the results of the December 2020 sampling event (see Figures E-2 and E-3). The concentration of site constituents in the Patchogue River resulting from groundwater discharge was estimated using the following equation:

$$C_R=mf_{sgw}/D_R$$

Where: C_R = Concentration of constituent in the river (µg/L)

mf_{sgw} = Mass flux to the river from shallow groundwater (µg/s)

D_R = Patchogue River volumetric flow (L/s)

To address some of the uncertainties in this evaluation, conservative assumptions were made in the above-described calculations which result in river water concentration estimates that are biased high. These assumptions are as follows:

- The hydraulic gradient (i) of groundwater is variable across the Site and thus, the highest hydraulic gradient value was used in the calculation. The larger the value of i, the greater the calculated value of mass flux.
- The plume thickness (b) was estimated conservatively by using the distance from the top of the water table to the top of the well screen of a deeper well at a well couplet, yet the actual plume thickness may be somewhat less, as site constituents were either not detected or detected at very low levels in the deeper wells positioned adjacent to the river. The larger the value of b, the greater the calculated value of mass flux.
- The river volumetric flow value used to calculate in river concentrations (11.2 ft^3/s or 317 L/s) was derived using a 7Q10 flow analysis (the lowest 7-day average flow that occurs, on average, once every 10 years) for the period April 1, 1958 through March 31, 1968 using data from a USGS river gauging station proximal the Site (USGS 01306000, Patchogue River at Patchogue New York). Thus, it was assumed for this estimate that the flow rate in the river is equal to that during periods of very low flow, and the lower the assumed river flow, the greater the estimated concentration in the river water. For comparison, the mean river flow rate at the same river gauging location using data from 1945 to 1976 is 20.4 ft^3/s (579 L/s). Table E-1 provides the data used to determine the 7Q10 flow

in the Patchogue River. Attachment E-1 presents the data plotted on log probability paper and the resultant 7Q10 flow value.

To screen for potential impacts to the river, the estimated concentrations of benzo(a)pyrene and phenanthrene were calculated using the above-described method and compared to the New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, June 1998 with Addenda dated April 2000 and June 2004). Listed in the table below are standards and guidance values for benzo(a)pyrene and phenanthrene that are applicable to Class C Fresh Water (no standards have been developed for these compounds).

Class C Fresh Surface Water Standards and Guidance Values

Substance	Water Class (per 6NYCRR Part 701)	Standard (µg/l)	Guidance Value (µg/l)	Protection for:
Benzo(a)pyrene	A, A-S, AA, AA-S, B, C, D	--	0.0012	Human Consumption of Fish
Phenanthrene	A, A-S, AA, AA-S, B, C	--	5.0	Fish propagation
	A, A-S, AA, AA-S, B, C, D	--	45	Fish survival

Attachments E-2 and E-3 contain the calculations and results for each of these constituents. The estimated concentrations in the Patchogue River resulting from site groundwater impacts are as follows:

- Benzo(a)pyrene = 0.00008 µg/L
- Phenanthrene = 0.025 µg/L

These conservatively estimated (i.e., biased high) concentrations are below the surface water guidance values listed above, including the lowest guidance value applicable to Class C surface waters. Also, the estimated concentrations are below the analytical laboratory detection limits for these constituents. Based on the evaluation conducted, site-related constituents in shallow groundwater do not impact surface water quality in the Patchogue River.

Tables

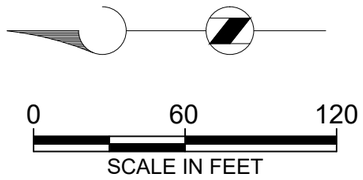
TABLE E-1
SUMMARY OF DATA USED TO CALCULATE 7Q10 FLOW IN PATCHOGUE RIVER
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

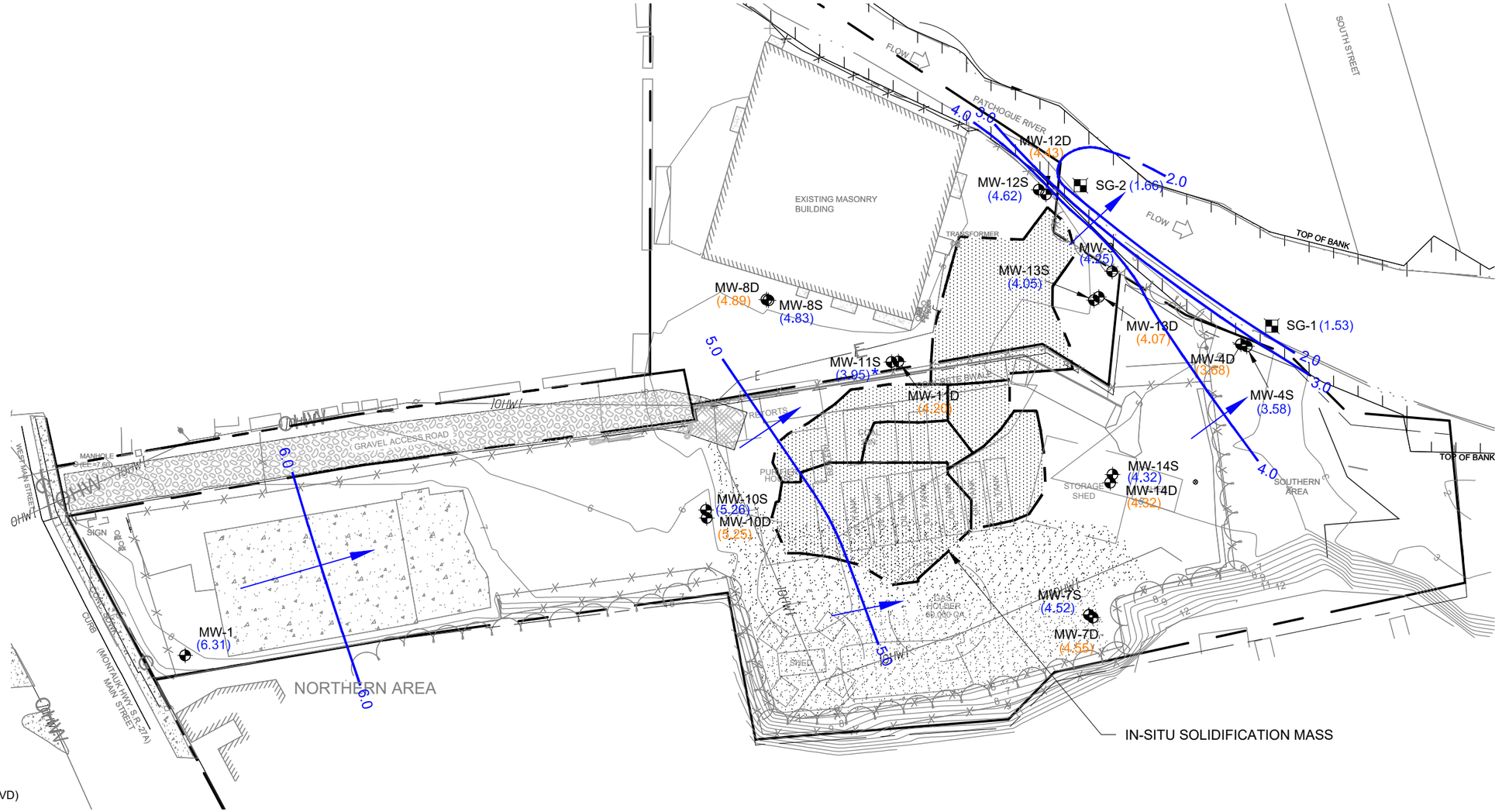
Water Year[(1)]	Low Flow (ft^3/s)	Rank	Probability
1961	20.1	1	0.091
1958	19.1	2	0.182
1960	16.9	3	0.273
1962	16.6	4	0.364
1959	16.0	5	0.455
1967	14.4	6	0.545
1964	13.6	7	0.636
1965	12.9	8	0.727
1963	12.4	9	0.818
1966	11.1	10	0.909

Notes:
(1) - 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through 3/31/1968.

ft^3/s - cubic feet per second

Figures





LEGEND:

- PROPERTY LINE
- FENCE
- 10 — TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- (4.30) GROUNDWATER ELEVATION (FT., NAVD) FROM SHALLOW MONITORING WELL (SCREENED ACROSS OR CLOSE TO WATER TABLE) OR RIVER LEVEL FROM STAFF GAUGE (FT., NAVD).
- (4.34) GROUNDWATER ELEVATION (FT., NAVD) FROM DEEP MONITORING WELL (SCREENED BELOW WATER TABLE). VALUE NOT USED FOR CONTOURING.
- GENERALIZED DIRECTION OF GROUNDWATER FLOW
- IN-SITU SOLIDIFICATION MASS

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: February 2021

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

WATER TABLE ELEVATION CONTOUR MAP
DECEMBER 28, 2020

FIGURE

E-1

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- FENCE
- 10 TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 0.1 ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L) - DECEMBER 2020
- 0.10 J BENZO(A)PYRENE CONCENTRATION IN GROUNDWATER (µg/L) - DECEMBER 2020
- ND NOT DETECTED
- J ESTIMATED CONCENTRATION
- 4.0 WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

LINE OF CROSS-SECTIONAL AREA USED FOR MASS FLUX ESTIMATE

IN-SITU SOLIDIFICATION MASS

NORTHERN AREA

SOUTHERN AREA

MW-1 ND
MW-4D ND
MW-4S ND
MW-7D ND
MW-7S ND
MW-8D ND
MW-8S ND
MW-10D ND
MW-10S ND
MW-11D ND
MW-11S 0.16 J
MW-12D ND
MW-12S ND
MW-13D ND
MW-13S ND
MW-14D ND
MW-14S ND
MW-3 0.40 J
SG-1
SG-2

Path: C:\users\asantiagobcpw\d09001435 File Name: BenzoApyrene_December2020 Plot Date: February 8, 2021 12:34 PM Cadd User: Alan Santiago

Brown AND Caldwell	SCALE: 1" = 60' 153021 DATE: January 2021	NATIONAL GRID PATCHOGUE FORMER MGP SITE VILLAGE OF PATCHOGUE, NEW YORK	BENZO(A)PYRENE IN GROUNDWATER DECEMBER, 2020	FIGURE E-2

0 60 120

SCALE IN FEET

LEGEND:

- PROPERTY LINE
- FENCE
- 10 — TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 1 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L) - DECEMBER 2020
- 0.74 — PHENANTHRENE CONCENTRATION IN GROUNDWATER (µg/L) - DECEMBER 2020
- ND — NOT DETECTED
- J — ESTIMATED CONCENTRATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

LINE OF CROSS-SECTIONAL AREA USED FOR MASS FLUX ESTIMATE

IN-SITU SOLIDIFICATION MASS

NORTHERN AREA

SOUTHERN AREA

MW-1 ND

MW-8D ND

MW-8S ND

MW-10S ND

MW-10D ND

MW-11S 0.74

MW-11D ND

MW-12D ND

MW-12S ND

MW-13D ND

MW-13S 45

MW-14S ND

MW-14D ND

MW-4D ND

MW-4S 0.15 J

MW-7S ND

MW-7D ND

SG-1

SG-2

PATCHOGUE RIVER

WEST MAIN STREET

SOUTH STREET

TOP OF BANK

FFE=5.75'

FFE=5.88'

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: January 2021

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

PHENANTHRENE IN GROUNDWATER (µg/L) DECEMBER, 2020

FIGURE

E-3

Path: C:\users\asantiago\bcpw\d0901435 File Name: Phenanthrene_December2020 Plot Date: February 8, 2021 12:33 PM Cadd User: Alan Santiago

Attachments

probability x 2 log cycles

RECURRENCE INTERVAL (yrs)

1.1 2 5 10

99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01

11.2 ft³/s

YEARLY 7 CONSECUTIVE DAY FLOW (ft³/s)

0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99

PROBABILITY OF LARGER FLOW (%)

ATTACHMENT E-2
MASS FLUX CALCULATIONS - BENZO(A)PYRENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Benzo(a)pyrene (December 2020) **Figure No.** See Figure E-2

$mf = kiA * C$

Where:
- mf = mass flux, µg/s
- k = hydraulic conductivity, cm/s
- I = hydraulic gradient, dimensionless
- A = cross-sectional area, $cm^{2\,(L * b)}$
- C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-0.1 Contour

						Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	0.1			
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours				
C=	0.1	µg/L =	0.0001	µg/cm^3	Geometric mean concentration between selected contours	0.1	0.10	16	18
L =	16	ft =	487.68	cm	Length of segment between selected contours [C]				
b =	18	ft =	548.64	cm	Saturated thickness				
mf =	2.5E-02	µg/s	7.7E-01	g/yr	0.00170 lbs/yr				
mf_{sgw} =	0.02450	µg/s	0.773	g/yr	0.00170 lbs/yr				

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
- D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
- mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.00008 µg/L

ATTACHMENT E-3
MASS FLUX CALCULATIONS - PHENANTHRENE
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

Phenanthrene (December 2020) **Figure No.** See Figure E-3

$mf = kiA * C$

Where:
- mf = mass flux, µg/s
- k = hydraulic conductivity, cm/s
- I = hydraulic gradient, dimensionless
- A = cross-sectional area, $cm^{2\,(L * b)}$
- C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

0.1-1 Contour

							Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells		0.1			
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours					
C=	0.316227766	µg/L =	0.000316228	µg/cm^3	Geometric mean concentration between selected contours		1	0.32	35	18
L =	35	ft =	1066.8	cm	Length of segment between selected contours [C]		10	3.16	67	18
b =	18	ft =	548.64	cm	Saturated thickness		13	11.40	26	18
mf =	1.7E-01	µg/s	5.3E+00	g/yr	0.01176	lbs/yr				

1-10 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	
C=	3.16	µg/L =	0.003162278	µg/cm^3	Geometric mean concentration between selected contours	
L =	67	ft =	2042.16	cm	Length of segment between selected contours [C]	
b =	18	ft =	548.64	cm	Saturated thickness	
mf =	3.2E+00	µg/s	1.0E+02	g/yr	0.2251	lbs/yr

10-13 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	
C=	11.40	µg/L =	0.011401754	µg/cm^3	Geometric mean concentration between selected contours	
L =	26	ft =	792.48	cm	Length of segment between selected contours [C]	
b =	18	ft =	548.64	cm	Saturated thickness	
mf =	4.5E+00	µg/s	1.4E+02	g/yr	0.3150	lbs/yr
mf_{sgw} =	7.95	µg/s	251	g/yr	0.552	lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
- D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
- mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 0.025 µg/L

Appendix F: Evaluation of Potential Impact to River from Increased pH Levels in Groundwater

Appendix G

Evaluation of Potential Impact to River from Increased pH Levels in Groundwater
Patchogue Former MGP Site
Patchogue, New York

As described in the Fourth Quarter 2020 Groundwater Monitoring Report, elevated pH levels were measured in the shallow groundwater (i.e., the upper ±18 feet) in the vicinity of the ISS mass during the December 2020 groundwater sampling activities. The increased pH levels are considered a potential effect from implementation of ISS in the area and it is anticipated that the pH will decrease to pre-remedy levels with time (i.e., as ISS mass continues to fully cure). Shallow groundwater generally flows from northwest to the south and southeast across the Site toward the Patchogue River (see Figure G-1 for a depiction of shallow groundwater flow).

The pH levels measured at MW-3 and MW-13S in December 2020 were 10.46 and 9.60, respectively, which is above the acceptable range for pH levels applicable to the Patchogue River (the portion of the Patchogue River proximal to the Site is classified as a Class C water body per 6 NYCRR Part 897). In accordance with 6 NYCRR Part 703.3, pH shall not be less than 6.5 nor more than 8.5 in Class C water bodies. Although it was not anticipated that the increased pH levels would result in an impact to surface water quality if they discharged to the river, the following analysis was conducted to confirm this.

An analysis was conducted to assess the potential for discharge of shallow groundwater with elevated pH levels to impact water quality in the Patchogue River. The evaluation was conducted by estimating the rate at which a mass of hydroxide (OH^-), dissolved in groundwater, may be contributing to the surface water in the Patchogue River (i.e., the mass flux of hydroxide from groundwater to surface water). This approach is consistent with that described in the document entitled "Groundwater Remediation Strategies Tool" (American Petroleum Institute Publication 4730, December 2003). The equation for calculating the mass flux of a constituent is:

$$mf = \Sigma\, C_i q_i A_i$$

Where: mf = total mass flux of dissolved hydroxide from the source (µg/sec)

C_i = concentration of the hydroxide ion (µg/mL=µg/cm^3)

q_i = specific discharge through the flow area (cm/sec)

where: q_i=Ki, with K= hydraulic conductivity (cm/sec) and i=hydraulic gradient (cm/cm)

A_i = flow area perpendicular to flow (cm^2)

where: A_i=(L)(b), with L=width of constituent plume perpendicular to flow and b=plume thickness

In applying this evaluation to the Site, an estimate of the mass flux of hydroxide (in µg/sec) was calculated for shallow groundwater. The mass flux for the shallow groundwater was calculated across a cross-sectional flow area positioned at the downgradient side of the former MGP site, aligned perpendicular to groundwater flow (which in this case is typically parallel or sub-parallel to the shore line). The vertical dimension of the flow area is equal to the plume thickness (b) within the shallow

groundwater. The horizontal dimension of the flow area, L, is equal to the width of the hydroxide plume, which is based on the isoconcentration contours developed from the results of the December 2020 sampling event (see Figure G-2). The concentration of hydroxide in the Patchogue River resulting from groundwater discharge was estimated using the following equation:

$$C_R = mf_{sgw}/D_R$$

Where: C_R = Concentration of hydroxide in the river (µg/L)

mf_{sgw} = Mass flux to the river from shallow groundwater (µg/s)

D_R = Patchogue River volumetric flow (L/s)

To address some of the uncertainties in this evaluation, conservative assumptions were made in the above-described calculations which result in river water concentration estimates that are biased high. These assumptions are as follows:

- The hydraulic gradient (i) of groundwater is variable across the Site and thus, the highest hydraulic gradient value was used in the calculation. The larger the value of i, the greater the calculated value of mass flux.
- The plume thickness (b) was estimated conservatively by using the distance from the top of the water table to the top of the well screen of a deeper well at a well couplet, yet the actual plume thickness may be somewhat less, as site constituents were either not detected or detected at very low levels in the deeper wells positioned adjacent to the river. The larger the value of b, the greater the calculated value of mass flux.
- The river volumetric flow value used to calculate in river concentrations (11.2 ft^3/s or 317 L/s) was derived using a 7Q10 flow analysis (the lowest 7-day average flow that occurs, on average, once every 10 years) for the period April 1, 1958 through March 31, 1968 using data from a USGS river gauging station proximal the Site (USGS 01306000, Patchogue River at Patchogue New York). Thus, it was assumed for this estimate that the flow rate in the river is equal to that during periods of very low flow, and the lower the assumed river flow, the greater the estimated concentration in the river water. For comparison, the mean river flow rate at the same river gauging location using data from 1945 to 1976 is 20.4 ft^3/s (579 L/s). Table G-1 provides the data used to determine the 7Q10 flow in the Patchogue River. Attachment G-1 presents the data plotted on log probability paper and the resultant 7Q10 flow value.
- The mass flux estimate assumes that there is no pH buffering capacity in the river water; the buffering capacity would resist change to pH in the river water due to contributions of higher pH groundwater.

To screen for potential impacts to the river, the estimated concentration of hydroxide was calculated using the above-described method and then converted back to pH to compare to water quality standards for pH per NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations. Attachment G-2 contains the calculations and results for the analysis performed. The estimated concentration of hydroxide in the Patchogue River resulting from site groundwater impacts is 3.67 µg/L, which equates to a pH level of 7.45. For comparison, water quality data was obtained from a USGS river gauging station proximal to the Site (USGS 01306000, Patchogue River at Patchogue New York) for the period May 6, 1966 to August 12, 1996; pH levels measured at this station during this period ranged from 5.3 to 8.4 and had a median of 6.8. This median pH value was accounted for in the mass flux estimate. Specifically, the median pH of 6.8 in the Patchogue River, which equates to a hydroxide ion concentration of 1.07 µg/L was added to the estimated hydroxide ion concentration in the river contributed by site groundwater to reflect hydroxide conditions already present in the surface water. The conservatively-estimated (i.e., biased high) pH level of 7.45 is above the median level measured in

the river, which may be a result of the increased pH levels in shallow groundwater adjacent to the river; however, it is within the acceptable range for pH levels in Class C water bodies in accordance with 6 NYCRR Part 703.3 (i.e., pH shall not be less than 6.5 nor more than 8.5). Based on the evaluation conducted, the increased pH levels in shallow groundwater do not impact surface water quality in the Patchogue River.

Tables

TABLE G-1
SUMMARY OF DATA USED TO CALCULATE 7Q10 FLOW IN PATCHOGUE RIVER
PATCHOGUE FORMER MGP SITE
PATCHOGUE, NEW YORK

Water Year[(1)]	Low Flow (ft^3/s)	Rank	Probability
1961	20.1	1	0.091
1958	19.1	2	0.182
1960	16.9	3	0.273
1962	16.6	4	0.364
1959	16.0	5	0.455
1967	14.4	6	0.545
1964	13.6	7	0.636
1965	12.9	8	0.727
1963	12.4	9	0.818
1966	11.1	10	0.909

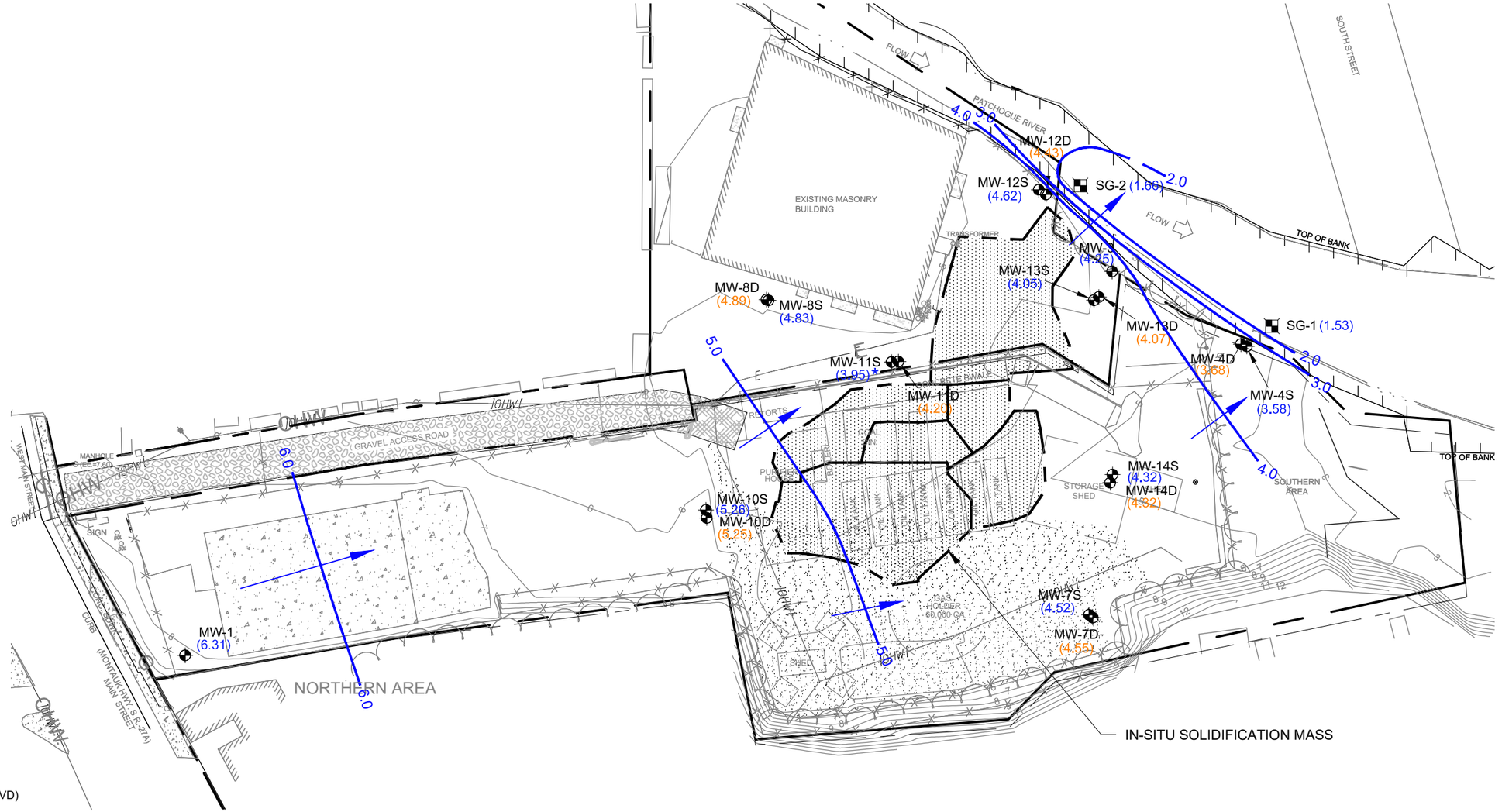
Notes:
(1) - 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through 3/31/1968.

ft^3/s - cubic feet per second

Figures

0 60 120

SCALE IN FEET



LEGEND:

- PROPERTY LINE
- FENCE
- 10 — TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- (4.30) — GROUNDWATER ELEVATION (FT., NAVD) FROM SHALLOW MONITORING WELL (SCREENED ACROSS OR CLOSE TO WATER TABLE) OR RIVER LEVEL FROM STAFF GAUGE (FT., NAVD).
- (4.34) — GROUNDWATER ELEVATION (FT., NAVD) FROM DEEP MONITORING WELL (SCREENED BELOW WATER TABLE). VALUE NOT USED FOR CONTOURING.
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: February 2021

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

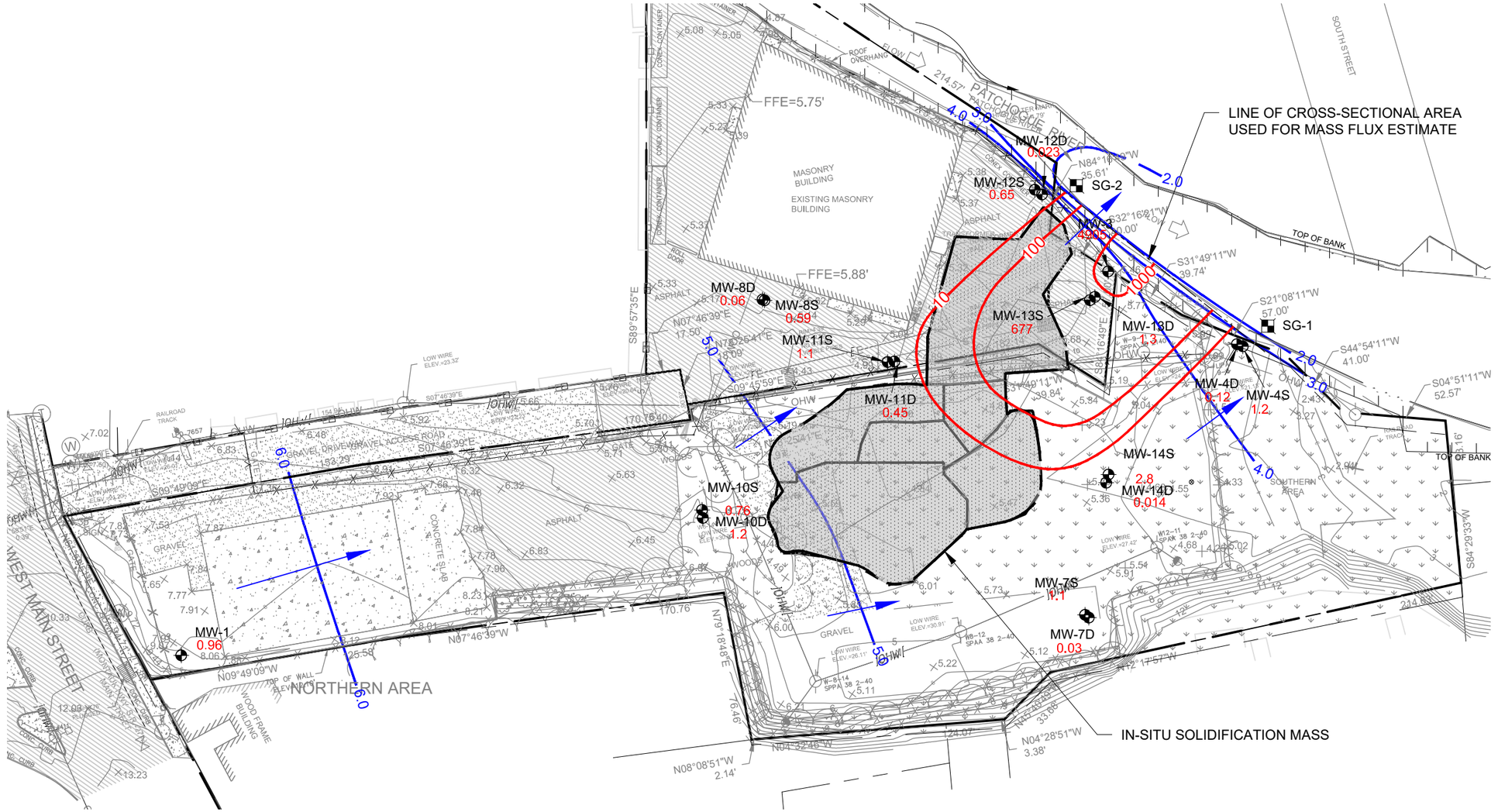
WATER TABLE ELEVATION CONTOUR MAP
DECEMBER 28, 2020

FIGURE

G-1

0 60 120

SCALE IN FEET



LEGEND:

- PROPERTY LINE
- FENCE
- 10 — TOPOGRAPHIC CONTOUR
- MONITORING WELL LOCATION
- STAFF GAGE LOCATION
- 10 — ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED). LOGARITHMIC CONTOUR INTERVAL (µg/L) - DECEMBER 2020
- 0.65 — HYDROXIDE CONCENTRATION IN GROUNDWATER (µg/L) - DECEMBER 2020
- 4.0 — WATER TABLE CONTOUR (FT., NAVD) DASHED WHERE INFERRED
- GENERALIZED DIRECTION OF GROUNDWATER FLOW

Brown AND Caldwell

SCALE: 1" = 60'

153021

DATE: January 2021

NATIONAL GRID
PATCHOGUE FORMER MGP SITE
VILLAGE OF PATCHOGUE, NEW YORK

HYDROXIDE(OH-) IN GROUNDWATER (µg/L) DECEMBER, 2020

FIGURE

G-2

Path: C:\users\asantiago\bcpw\d0901435 File Name: Hydroxide(OH-)_December2020 Plot Date: February 9, 2021 12:33 PM Cadd User: Alan Santiago

Attachments

probability x 2 log cycles

RECURRENCE INTERVAL (yrs)

1.1 2 5 10

99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01

11.2 ft³/s

YEARLY 7 CONSECUTIVE DAY FLOW (ft³/s)

0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99

PROBABILITY OF LARGER FLOW (%)

ATTACHMENT G-2
MASS FLUX CALCULATIONS - pH
PATCHOGUE RIVER

Mass Flux Calculation
Enter site data in yellow highlighted cells

pH (December 2020) **Figure No.** See Figure G-2

mf = kiA * C
Where: mf = mass flux, µg/s
k = hydraulic conductivity, cm/s
I = hydraulic gradient, dimensionless
A = cross-sectional area, $cm^{2\,(L * b)}$
C = (µg/L)/1000=µg/cm^3

Shallow Groundwater Flux

10-100 Contour

						Contour Interval	Geomean	Segment Length	Thickness
k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells	10			
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours	100	31.62	23	18
C=	31.6227766	µg/L =	0.031622777	µg/cm^3	Geometric mean concentration between selected contours	1000	316.23	63	18
L =	23	ft =	701.04	cm	Length of segment between selected contours [C]	4905	2214.72	25	18
b =	18	ft =	548.64	cm	Saturated thickness				
mf =	1.1E+01	µg/s	3.5E+02	g/yr	0.77275 lbs/yr				

100-1000 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	316.23	µg/L =	0.316227766	µg/cm^3	Geometric mean concentration between selected contours
L =	63	ft =	1920.24	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	3.1E+02	µg/s	9.6E+03	g/yr	21.1665 lbs/yr

1000-4905 Contour

k =	6.1E-03	hydraulic conductivity, cm/s			Geometric mean of PDI slug tests for shallow water table wells
i =	0.15	hydraulic gradient, dimensionless			Measured in vicinity of selected contours
C=	2214.72	µg/L =	2.214723459	µg/cm^3	Geometric mean concentration between selected contours
L =	25	ft =	762	cm	Length of segment between selected contours [C]
b =	18	ft =	548.64	cm	Saturated thickness
mf =	8.5E+02	µg/s	2.7E+04	g/yr	58.8258 lbs/yr
mf_{sgw} =	1164.11	µg/s	36711.4	g/yr	80.765 lbs/yr

River Concentration

$$C_R = \frac{mf_{sgw}}{D_R}$$

Where:
D_R = Patchogue River flow, L/s — 11.2 — 7Q10 flow (ft^3/s) calculated using data from a USGS river gauging station (USGS 01306000 PATCHOGUE RIVER AT PATCHOGUE NY), for period 4/1/1958 through
mf_{sgw} = Shallow groundwater flux — See above

D_R = 11.2 ft^3/s = 317 L/s

C_R = 4.74 µg/L
Note - Value is based on hydroxide ion (OH^-) from groundwater discharge plus ambient OH^- in river (1.07 µg/L).

pH_R = 7.45 std. units