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Emerging Contaminant Groundwater Sampling Report

National Grid Downstate New York MGP Sites

Brooklyn, Queens, and Long Island, New York

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CERTIFICATION STATEMENT

I, KATHLEEN SLIMON, certify that I am currently a New York State registered professional engineer and that this Groundwater Sampling Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).

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Abbreviations and Acronyms

bgs	below ground surface
DER	Division of Environmental Remediation
D&B	Dvirka and Bartilucci
EPA	Environmental Protection Agency
GEI	GEI Consultants, Inc., P.C.
LIPA	Long Island Power Authority
LIRR	Long Island Railroad
LNG	liquified natural gas
LPG	liquified petroleum gas
MGP	Manufactured Gas Plant
MTA	Metropolitan Transportation Authority
NAPL	Non-Aqueous Phase Liquid
NCI	National Cancer Institute
ng/L	nanogram per liter
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PFOA	Perfluorooctanoic acid
PFAS	Per- and Polyfluoroalkyl Substances
PFBA	Perfluorobutanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFOS	Perfluorooctane sulfonic acid
ppt	parts per trillion
PS&S	Paulus, Sokolowski and Sartor Engineering PC
PSEG	Public Service Enterprise Group
SNG	substitute natural gas
SCWA	Suffolk County Water Authority
TCA	Trichloroethane
µg/L	micrograms per liter

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Executive Summary

This report has been prepared by GEI Consultants, Inc., P.C. (GEI) on behalf of National Grid and presents the results of emerging contaminant groundwater sampling at the downstate former Manufactured Gas Plant (MGP) sites. As a result of certain emerging contaminants having been found in a number of drinking water supplies in New York State, the Clean Water Infrastructure Act of 2017 directed the New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), to build a comprehensive database, evaluate, and prioritize inactive solid waste sites statewide to determine any potential impacts from emerging contaminants on drinking water sources. To implement this directive, NYSDEC issued letters to remediation sites with existing monitoring wells requesting the collection of groundwater samples and submittal of data for per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. National Grid has an extensive monitoring well network at various MGP sites in New York. Therefore, by letters dated May 30, 2018, NYSDEC requested National Grid sample a select number of existing monitoring wells from specified former MGP sites for PFAS and 1,4-dioxane in order to utilize existing well infrastructure to satisfy NYSDEC's commitment to analyze representative groundwater samples at remediation sites for emerging contaminants.

PFAS and 1,4-dioxane have historically not been evaluated at MGP remediation sites because they are not associated with former MGP operations. It is well documented that PFAS were not manufactured before the 1940's and 1,4 dioxane was not manufactured prior to 1951, which makes it highly unlikely that these chemicals were used at MGP sites. PFAS are a large group of highly soluble manmade chemicals that have been widely used since the 1940s to make fluoropolymer coatings and are present in a multitude of everyday products to increase resistance to stains, grease, heat, and water. 1,4-Dioxane is used primarily as a solvent in paints, varnishes, lacquers, cosmetics, deodorants, cleaning and detergent preparations, and in scintillating fluids and was not manufactured prior to 1951. Many of the sites identified for sampling by NYSDEC have been sold and used for other purposes since their use as MGP sites and are located within highly industrial areas with many potential sources of the 1,4-dioxane and PFAS compounds.

The emerging contaminant groundwater sampling was performed in accordance with the *Emerging Contaminant Groundwater Sampling Work Plan, National Grid Downstate and Upstate New York MGP Sites* (Work Plan) letter from National Grid to NYSDEC, dated September 4, 2018. In accordance with the NYSDEC-approved Work Plan, precautions were taken during sampling for PFAS to minimize the potential for false detections.

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Groundwater sampling was completed at 18 of the 24 downstate former MGP sites identified in the Work Plan between September 24, 2018 and October 23, 2018. Sampling has not been completed at the following six sites due to site access issues.

- Babylon MGP Site
- Citizens MGP – Carroll Gardens Site
- Jamaica Gas and Light MGP Site
- Metropolitan Works MGP Site
- Union Station Holder Site
- Williamsburg Works MGP Site

National Grid is continuing to seek access to these sites from the current property owners. The data for these sites will be submitted in the future after access has been obtained, the sampling has been completed, and validated analytical data is available.

At the 18 sites where sampling has been completed, two to five groundwater wells were selected for sampling at each site to represent upgradient, on site, and downgradient groundwater conditions, where possible. Groundwater samples were collected at a total of 54 wells and analyzed for PFAS and 1,4-dioxane. Each sample was analyzed by Test America (Edison, New Jersey and Burlington, Vermont) for the following analyses in accordance with the Work Plan:

- Modified United States Environmental Protection Agency (EPA) Method 537
- 1,4-dioxane by EPA Method SIM 8270D

Quality Assurance/Quality Control samples were collected in accordance with the Work Plan and Quality Assurance Project Plan.

1,4-Dioxane was detected at concentrations above the NYSDEC Groundwater and Drinking Water Screening Level (0.35 ug/L) at six of the 18 sites, in a total of eight of the 54 wells sampled. Five sites had concentrations of 1,4-dioxane detected above the Screening Level in only one of the wells sampled at the site and one site had concentrations of 1,4-dioxane detected in all three wells sampled at this site.

PFAS compounds were detected at concentrations above the NYSDEC Screening Levels at 16 of the 18 sites in 36 of the 54 wells sampled. The two sites that did not have concentrations of PFAS compounds above the Screening Levels were the Glen Cove and Sag Harbor sites. Of the 16 sites that had PFAS concentrations above the Screening Levels, 12 sites (20 wells) had concentrations above the higher Groundwater Screening Levels.

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1. Introduction

This report has been prepared by GEI Consultants, Inc., P.C. (GEI) on behalf of National Grid and presents the results of emerging contaminant groundwater sampling at the downstate former Manufactured Gas Plant (MGP) sites. The emerging contaminant groundwater sampling was performed in accordance with the *Emerging Contaminant Groundwater Sampling Work Plan, National Grid Downstate and Upstate New York MGP Sites* (Work Plan) letter from National Grid to the New York State Department of Environmental Conservation (NYSDEC) dated September 4, 2018.

As a result of certain emerging contaminants having been found in a number of drinking water supplies in New York State, the Clean Water Infrastructure Act of 2017 directed NYSDEC, in consultation with New York State Department of Health (NYSDOH), to build a comprehensive database, evaluate, and prioritize inactive solid waste sites statewide to determine any potential impacts from emerging contaminants on drinking water sources. To implement this directive, NYSDEC issued letters to remediation sites with existing monitoring wells requesting the collection of groundwater samples and submittal of data for per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. National Grid has an extensive monitoring well network at various MGP sites in New York. Therefore, by letters dated May 30, 2018, NYSDEC requested National Grid sample a select number of existing monitoring wells from specified former MGP sites for PFAS and 1,4-dioxane in order to utilize existing well infrastructure to satisfy NYSDEC's commitment to analyze representative groundwater samples at remediation sites for emerging contaminants. Many of the sites identified for sampling by NYSDEC have been sold and used for other purposes since their use as MGP sites and are located within highly industrial areas with many potential sources of the 1,4-dioxane and PFAS compounds.

PFAS are a large group of highly soluble manmade chemicals that have been widely used since the 1940s to make fluoropolymer coatings and everyday products more resistant to stains, grease, heat, and water (EPA, 2018a and 2018b). Fluoropolymer coatings are blends of resins and lubricants used in products such as water-repellent clothing, furniture, adhesives, paint and varnish, food packaging, heat-resistant non-stick cooking surfaces and insulation of electrical wires (NYSDEC, 2018). Although the use of perfluorooctanoic acid (PFOA) is being phased out, the chemical is still used to make household and commercial products that resist heat and repel stains. Perfluorooctane sulfonic acid (PFOS) is used in fire-fighting foam and is a newly listed hazardous substance (as is PFOA). PFAS are highly soluble, stable, and have low volatility. They are dispersed by air emissions into the atmosphere or deposited directly to surface water or the land surface. PFAS present in unsaturated soils leach downward through the subsurface with precipitation and are transported via groundwater flow. Since PFAS were not manufactured prior to the 1940s and

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are not associated with former MGP site operations, it is highly unlikely that these chemicals were used at MGP sites.

1,4-Dioxane is used primarily as a solvent in paints, varnishes, lacquers, cosmetics, deodorants, cleaning and detergent preparations, and in scintillating fluids. 1,4-Dioxane often has been used with chlorinated solvents, particularly 1,1,1-trichloroethane (TCA), as a stabilizer and corrosion inhibitor (EPA, 2018c). Commercial production of 1,4-dioxane in the United States was first reported in 1951 (NCI, 1985). Since 1,4-dioxane was not manufactured prior to 1951 and is not associated with former MGP site operations, it is highly unlikely that this chemical was used at MGP sites.

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2. Scope of Work

2.1 Groundwater Sampling Summary

Groundwater sampling was completed at 18 of the 24 downstate former MGP sites identified in the Work Plan between September 24, 2018 and October 23, 2018. Sampling has not been completed at the following six sites due to site access issues.

- Babylon MGP Site
- Citizens MGP – Carroll Gardens Site
- Jamaica Gas and Light MGP Site
- Metropolitan Works MGP Site
- Union Station Holder Site
- Williamsburg Works MGP Site

National Grid is continuing to seek access to these sites from the current property owners. The data for these sites will be submitted in the future after access has been obtained, the sampling has been completed, and validated analytical data is available.

For the 18 sites where sampling has been completed, the Work Plan identified sampling a total of two to five groundwater wells at each site to represent upgradient, on site, and downgradient groundwater conditions, where possible. The wells were selected based on a review of site specific groundwater conditions and the location of existing groundwater monitoring wells. Some of the wells identified in the Work Plan were damaged, contained non-aqueous phase liquid (NAPL), or could not be located. For these wells, replacement wells were identified in the field and sampled. A summary of wells sampled at each of the sites, any deviations from the Work Plan, and the sampling dates are provided in Table 1. The rationale for well selection is provided with the discussion of results for each of the sites in Section 3 below. Groundwater samples were collected at a total of 54 wells and analyzed for PFAS and 1,4-dioxane in accordance with the Work Plan.

2.2 Sampling and Analysis Program

The Work Plan provides the means and methods for sampling groundwater and analyzing for 1,4-dioxane and PFAS. The samples were collected in accordance with the Field Sampling Plan and NYSDEC Guidance, which provide specific precautions to be taken during sampling for PFAS to minimize the potential for false detections. Depth to groundwater measured from each well prior to sampling and final groundwater discharge parameters recorded for each well are provided in Appendix A.

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Each sample was analyzed by Test America (Edison, New Jersey and Burlington, Vermont), NYSDOH Environmental Laboratory Approval Program certified and National Environmental Laboratory Accreditation Program-accredited laboratories, for the following analyses in accordance with the Work Plan:

- Modified United States Environmental Protection Agency (EPA) Method 537
- 1,4-Dioxane by EPA Method SIM 8270D

Quality Assurance/Quality Control samples were collected in accordance with the Work Plan and Quality Assurance Project Plan.

Analytical results were provided in a New York State Category B data deliverable format. The data was validated by GEI in accordance with New York State Analytical Service Protocols. Data usability summary reports were prepared to document the adequacy of the analytical data obtained from the laboratory and to discuss any quality control non-compliance issues or limitations on the use of the data. In December 2018, GEI provided the data in the NYSDEC-required format. The data usability summary reports are provided in Appendix B.

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3. Findings

The discussion below presents the analytical results from groundwater samples collected at each site and a comparison to the NYSDEC Screening Values provided in the August 20, 2018 NYSDEC letter (NYSDEC 2018a). Groundwater analytical results for each site are compared to the NYSDEC Screening Values and summarized in Tables 2 through 19. Groundwater monitoring well locations and analytical results at concentrations above the NYSDEC Screening Values are provided in Figures 1 through 18 for each of the sites.

The location of water supply wells within a ½-mile of each of the sites was identified through review of existing well search information provided in previous site investigation reports and review of information provided by NYSDEC's Google Earth Water Wells map that provides information on water supply wells installed after April 2000. The location of water supply wells identified within a ½-mile of the site is provided in Figures 19 through 26, for each of the applicable sites.

3.1 Bay Ridge Holder Stations A & B Site

The validated analytical results for the Bay Ridge Holder Station site compared against the NYSDEC Screening Levels are provided in Table 2. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 1.

There are currently no existing groundwater monitoring wells on Bay Ridge Holder Station A. The following two groundwater monitoring wells identified in the Work Plan were sampled on Bay Ridge Holder Station B:

- MW-112: upgradient on-site well located on the southern upgradient corner of Holder Station B; and
- MW-105: downgradient off-site well located on the sidewalk downgradient of the north-central Holder Station B property line.

Concentrations of PFOA are above the Drinking Water Screening Level but are below the Groundwater Screening Level in both MW-112 and MW-105. Total PFAS concentrations range from 116.89 ng/L in the downgradient location (MW-105) to 238.7 ng/L at upgradient sample location MW-112. Concentrations of 1,4-dioxane were not detected in either sample.

Holder Station B operated as a holder station from prior to 1905 until between 1956 and 1966 and is currently owned and operated by National Grid. A natural gas gate station and vacant land occupy the eastern portion of the site and baseball fields are present on the western portion of the site (AECOM, 2012).

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There are no water supply wells within a ½ mile of the site (Environmental Data Resources Inc. (EDR) 2005) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.2 Bay Shore MGP Site

The validated analytical results for the Bay Shore site compared against the NYSDEC Screening Levels are provided in Table 3. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 2.

The following five groundwater monitoring wells identified in the Work Plan were sampled at the Bay Shore former MGP site:

- MW-29S: upgradient on-site well located on the Brightwaters Yard portion of Operable Unit 3 (OU-3);
- OU3MW-11S: downgradient on-site well located on the Brightwaters Yard portion of OU-3;
- MW-09I: upgradient on-site well located on the upgradient OU-1 site boundary in the gas regulating station;
- BBMW-41I: on-site well in OU-1 North; and
- OU2MW-57I: off-site well downgradient of OU-1 on the upgradient OU-2 boundary, immediately downgradient of the former King Bear/Summers Lumber properties.

Concentrations of PFOS were above the Drinking Water Screening Level but were below the Groundwater Screening Level in samples collected from the OU-1 on-site well BBMW-41I and OU-1 downgradient well OU2MW-57I. There were no analytes detected above the NYSDEC Screening Levels at the OU-1 upgradient well or the wells sampled on OU-3. Total PFAS values ranged from 53.11 ng/L at MW-29S to 104.98 ng/L at OU2MW-57I. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as an MGP from 1889 to 1973. The OU-1 and OU-3 Brightwaters Yard portion of the site is currently owned by National Grid. OU-1 North was the location of the main MGP operations and is currently vacant with the exception of a natural gas regulating station on the northern property boundary. The highest PFAS concentration detected was in OU2MW-57I, which is located downgradient of the King Bear/Summers Lumber properties that were not part of the MGP operations. These properties were operated as an automobile service center and lumber yard prior to being purchased by National Grid to facilitate the remediation of MGP impacts. A former drywell associated with the automotive operations was located immediately upgradient of OU2MW-57I. The dry well was tied to the bay drains in the former automotive service center.

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There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000. The following information on water supply wells within a ½-mile of the Bay Shore former MGP site was obtained from the 2002 Remedial Investigation Report (D&B 2002a). A total of 18 public water supply and five NYSDEC-registered private supply wells were identified in 2002 within a 1/2-mile radius of the site. The location of each water supply well is shown in Figure 19.

The Suffolk County Water Authority (SCWA) Fifth Avenue Public Water Supply Well Field (Station 27) is located approximately 1/4-mile northwest and upgradient of the site. The SCWA Fifth Avenue well field, consists of 18 wells, however, only two of the 18 wells were active at the time of the 2002 RI. The active wells extract water from the Magothy aquifer. Five privately owned water supply wells were identified within 1/2-mile of the site in 2002. The private well uses were identified as for irrigation or air conditioning purposes.

3.3 Clifton MGP Site

The validated analytical results for the Clifton site compared against the NYSDEC Screening Levels are provided in Table 4. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 3.

The following three groundwater monitoring wells were sampled at the Clifton former MGP site:

- RW-210I: on-site upgradient well, located in the southern upgradient corner of OU-2. Intermediate well RW-210I (screened 25 to 35 ft bgs) was sampled in place of adjacent shallow well RW-210S (screened 15 to 25 ft bgs) identified in the Work Plan due to NAPL observed at RW-210S;
- RW-202S: on-site well, located on the northeastern downgradient edge of OU-2; and
- RW-23: off-site downgradient well; located at 1 Edgewater Street/Edgewater Plaza.

There were no emerging contaminants detected above the NYSDEC Screening Values at the on-site upgradient well RW-201I or the on-site well RW-202S. The concentration of PFOA was above the Groundwater Screening Level and the concentration of PFOS was above the Drinking Water Screening Level in the sample collected from the off-site downgradient well, RW-23. Total PFAS values ranged from 0.62 ng/L at RW-210I to 208.43 ng/L at RW-23. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as an MGP from 1856 to 1957. The OU-2 portion of the site is currently owned and by National Grid and is vacant land. The off-site downgradient well, RW-23, is located on Edgewater Plaza. Edgewater Plaza was a former oil terminal owned by others, and the current site use is as an office building (AECOM, 2016a).

No water supply wells have been identified within a ½ mile of the site.

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3.4 Equity Works MGP Site

The validated analytical results for the Equity Works site compared against the NYSDEC Screening Levels are provided in Table 5. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 4.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Equity Works former MGP site:

- MW-6B: off-site upgradient, located in the sidewalk approximately 50-feet west of the site;
- MW-8B: on site, on the northwest portion of the site; and
- MW-11B: off-site downgradient, located approximately 100-feet southeast of the site in the Federal Express truck terminal parking lot.

Concentrations of perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), PFOA and Total PFAS were above the Groundwater Screening Level and PFOS was above the Drinking Water Screening Level in the sample collected from the on-site well MW-8B. There were PFAS compounds detected above the Screening Levels in the upgradient or downgradient off-site wells. Concentrations of 1,4-dioxane were above the Groundwater Screening Level in the samples collected from all three wells. The 1,4-dioxane concentrations ranged from 0.43 ug/L in the on-site well MW-8B to 1.1 ug/L in the downgradient well MW-11B.

The site operated as an MGP from 1892 to 1929 and was decommissioned in 1933. The property was sold in 1951 and has been used for pipe and valve storage, waste recycling, and as a transfer station, and is not currently owned by National Grid (AECOM, 2016b). The site use as a solid waste transfer facility from 1989 to present is believed to have resulted in a complex nature of environmental impacts to soil and groundwater and is a potential source of 1,4-dioxane and PFAS at the site.

There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000. There are reports of a private water supply well located at a truck wash facility upgradient of the site at 184 Maspeth Avenue as shown in Figure 20. No further details are available for this well. There were no water supply wells identified in the search performed by EDR (EDR 2004a).

3.5 Far Rockaway MGP Site

The validated analytical results for the Far Rockaway site compared against the NYSDEC Screening Levels are provided in Table 6. The groundwater monitoring well locations and

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analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 5.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Far Rockaway former MGP site:

- MW-116D: upgradient, on sidewalk on adjacent eastern property boundary;
- MW-118DR: near site, on sidewalk on adjacent downgradient western property boundary; and
- MW-119D: downgradient, approximately 100 feet west of the site downgradient of the adjacent Long Island Railroad (LIRR) property.

Concentrations of PFOA and PFOS were above the Drinking Water Screening Level in all of the samples and the PFOS concentration was above the Groundwater Screening Level in the sample collected from the near site well MW-118DR. Total PFAS ranged from 139.25 ng/L at downgradient well MW-119D to 248.99 ng/L at the near site downgradient well MW-118DR. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as a MGP between the mid 1890's and 1909. The property was sold in 1965 and is not currently owned by National Grid. Following the operation of the MGP, the site was utilized as office and manufacturing space. The site was used for plastic and other manufacturing uses from approximately 1975 until 1999.

There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000. The results of an informal well survey performed by AECOM are presented below and on Figure 21. There were multiple water supply wells located within a ½ mile of the site, however, the current status and use of these wells has not been identified. One public supply well location (NY0003913) was identified in a 2004 EDR Report (EDR 2004b), as shown on Figure 21.

3.6 Flatbush Station A & B Site

The validated analytical results for the Flatbush Station A & B former holder site compared against the NYSDEC Screening Levels are provided in Table 7. The groundwater monitoring well locations and analytes in detected at concentrations above the NYSDEC Screening Levels are provided in Figure 6.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Flatbush Station A & B site:

- MW-2: on-site upgradient, located in the northeast corner of the current State University of New York (SUNY) parking lot;
- MW-4: on site, located immediately south of the northern SUNY parking lot, and;

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- MW-7: on-site downgradient, located on the western portion of the southern downgradient site boundary.

Concentrations of PFOA and PFOS were detected above the Drinking Water Screening Level but are below the Groundwater Screening level in all three of the samples. Total PFAS concentrations ranged from 139.53 ng/L at on-site well MW-4 to 212.27 ng/L at upgradient well MW-2. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as a MGP from approximately 1873 until between 1947 and 1954. The properties were sold in 1929, 1943, 1955, and 1980 and are not currently owned by National Grid. The properties have been used for parking lots, manufacturing, auto body shop, as a garage, and packaging tobacco and candy. The current uses of the site include the SUNY parking areas and the SUNY Health Science Center (AECOM, 2016c).

There are no water supply wells within a ½ mile of the site (EDR 2004c) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.7 Former Brooklyn Borough Gas Works (Coney Island) MGP Site

The validated analytical results for the Coney Island site compared against the NYSDEC Screening Levels are provided in Table 8. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 7.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Coney Island site:

- MW-18: on-site upgradient, on the north-central property boundary;
- MW-2: on site, in the central portion of the site; and
- MW-16: on-site downgradient, on the south-southeastern property boundary.

Concentrations of PFOA were above the Groundwater Screening Level in all three of the samples. Concentrations of PFOS were above the Groundwater Screening Level in on site downgradient well MW-16 and on site upgradient well MW-18 and was above the Drinking Water Screening Level in on-site well MW-2. The highest PFAS concentrations were detected in on site downgradient well MW-16 with concentrations of PFBA, perfluorohexanesulfonic acid (PFHxS), PFOS, PFOA, and total PFAS above the Groundwater Screening Level. The total PFAS concentrations range from 358.12 ng/L in the duplicate sample at on site upgradient well MW-18 to 2,083.29 ng/L in the downgradient on-site well MW-16. The concentration of 1,4-dioxane was above the Groundwater Screening Level in the on-site well MW-2.

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The site operated as a MGP from 1908 until 1951. Between 1952 and 1959, the site's gas manufacturing capability may have been maintained and operated for the purpose of peak shaving. From 1960 to 1966, the facility was almost completely decommissioned and demolished. In 1974, a few buildings associated with a gate station remained operational providing natural gas service. National Grid believes the gate station and gasholders were taken off line at the end of the 1970s and were reported to be subsequently decommissioned and surface features were demolished in the early 1980s (PS&S, 2013). The site is currently owned by National Grid. Immediately upgradient of the site is the elevated Belt Parkway with stormwater drainage to the ground surface below and a Metropolitan Transportation Authority (MTA) rail yard. The MTA rail yard is the largest rapid transit rail yard in the State of New York and operations have included maintenance, overhaul, storage, washing, and painting of the rail cars. The rail yard has also included a firing range for the New York City Police Department's Transit Division and a firefighting training school (New York City Department of City Planning, 2018).

There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000. No additional well search data has been obtained for this site.

3.8 Fulton Works MGP Site

The validated analytical results for the Fulton Works former MGP site compared against the NYSDEC Screening Levels are provided in Table 9. The groundwater monitoring well locations and analytes that were detected above the NYSDEC Screening Levels are provided in Figure 8.

The following four groundwater monitoring wells were sampled at the Fulton site:

- FW-MW-19: upgradient, located northeast of Parcel VII and east of Parcel II;
- FW-MW-5R: near site, located on the northwestern boundary of Paracel II
- FW-MW-04: downgradient, located on the northwestern boundary of Parcel III. FW-MW-04 was sampled in place of FW-MW-4R due to a pressure transducer located at FW-MW-4R; and
- FW-MW-17: downgradient, located on the north central boundary of Parcel I.

Concentrations of PFOA were above the Groundwater Screening Level in three of the four wells sampled (upgradient well FW-MW-19, and downgradient wells FW-MW-04 and FW-MW-17) and was above the Drinking Water Screening Level in near site well FW-MW-5R. The concentration of PFOS was above the Drinking Water Screening Level in downgradient well FW-MW-04. The highest PFAS concentrations were detected in upgradient well FW-MW-19 with concentrations of perfluoroheptanoic acid (PFHpA), perfluorohexanoic acid (PFHxA), PFOA and total PFAS above the Groundwater Screening Level. The total PFAS

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concentrations range from 65.67 ng/L in the near site well FW-MW-5R to 670.89 ng/L in the upgradient well FW-MW-19. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as an MGP from 1879 until prior to 1938. The properties were sold between 1938 and 1948 and are not currently owned by National Grid. The properties have been used for newspaper operations, garages, paint shop, metal spinning and stamping, warehouses, autobody repair work, auto and truck repair and wrecking, used car sales, iron works, and carting (GEI 2012).

There are no water supply wells within a ½ mile of the site (EDR 2004d) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.9 Glen Cove MGP Site

The validated analytical results for the Glen Cove former MGP site compared against the NYSDEC Screening Levels are provided in Table 10. The groundwater monitoring well locations are provided in Figure 9.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Glen Cove site:

- PZ-06: on site upgradient, located in the northeastern corner of the site;
- GCRW-03: on site, located in the central northern portion of the site; and
- GCMW-14SR: on site downgradient, located adjacent to the central-western property line.

Concentrations of PFAS compounds were not detected above the Screening levels. Total PFAS concentrations ranged from 24.74 ng/L in on-site well GCRW-03 to 66.37 ng/L in on site downgradient well GCMW-14SR. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as a MGP from 1905 until 1929. From 1929 until between 1959 and 1966 site activities consisted solely of natural gas storage in the Hortonsphere gas holder. A major electrical substation was constructed on the site in the mid-1960s. The site is not owned by National Grid. It is currently owned by LIPA and operated by Public Service Enterprise Group (PSEG) under contract to LIPA (PS&S, 2008).

The following information on water supply wells within a ½-mile of the Glen Cove former MGP site was obtained from the 2008 Final Remedial Investigation Report (PS&S, 2008). One public water supply well owned by the City of Glen Cove was located within a ½ mile of the site as shown in Figure 22. This well is located approximately 1,600 feet upgradient of the site and is screened from 243 to 293 ft-bgs.

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There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.10 Greenpoint MGP - Energy Center Site

The validated analytical results for the Greenpoint former MGP site compared against the NYSDEC Screening Levels are provided in Table 11. The groundwater monitoring well locations are provided in Figure 10.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Greenpoint site:

- GPEC-MW-220I: on-site upgradient, located on the upgradient property boundary.
- GPEC-MW-11: on site, located in the central portion of the site; and
- GPEC- MW-3S: on-site downgradient; located at the downgradient property boundary.

The concentration of PFOA was above the Drinking Water Screening Level in the on-site upgradient well GPEC-MW-220I and above the Groundwater Screening Level in on-site downgradient well GPEC-MW-3S. The concentration of PFOS was above the Drinking Water Screening Level in on site upgradient well GPEC-MW-220I. There were no analytes detected at concentrations above the Screening Levels in on-site well GPEC-MW-11. Total PFAS concentrations ranged from 51.55 ng/L at on-site well GPEC-MW-11 to 256.17 ng/L at upgradient well GPEC-MW-220I. Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as a MGP from 1927 until 1968. By the late 1960s, liquified natural gas (LNG) was stored at the site and in the mid-1970s a modern substitute natural gas (SNG) plant was built which produced 60 million cubic feet per day. The SNG was used for base load conditions. It operated for approximately 12 years before closure in 1985. The LNG facility still stands today, and the site is used as a major regional regulator station for the natural gas network. The site is currently owned by National Grid (GEI, 2016a).

There are reports of a private water supply well located at a truck wash facility upgradient of the site at 184 Maspeth Avenue as shown in Figure 23. No further details are available for this well. There were no water supply wells identified in the search performed by EDR (EDR 2004e) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

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3.11 Inwood Holder Site

The validated analytical results for the Inwood Holder site compared against the NYSDEC Screening Levels are provided in Table 12. The groundwater monitoring well locations are provided in Figure 11.

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The following three groundwater monitoring wells were sampled at the Inwood site:

- MW-52I: on-site upgradient, in the northeastern corner of the site. MW-52I (screened from 13 to 23 ft-bgs) was sampled in place of adjacent well MW-52S (screened from 1 to 11 ft-bgs) because MW-52S could not be located;
- MW-16S: on site, centrally located. MW-16S was sampled in place of MW-19S due to the presence of NAPL at MW-19S. MW-16S is approximately 100 feet downgradient of MW-19S; and
- GW-8: on site downgradient, located on the southwest portion of the site.

The highest PFAS concentrations were detected in onsite upgradient well MW-52I with the concentration of PFOS above the Groundwater Screening Levels. PFOA was detected in above the Drinking Water Screening Levels at upgradient on-site well MW-52I and downgradient onsite well GW-8. Total PFAS concentrations ranged from 37.21 ng/L at on-site well MW-16S to 237.68 ng/L at upgradient well MW-52I. The concentration of 1,4-dioxane was above the Groundwater Screening Level in the on-site downgradient well GW-8. There were no analytes detected above the Screening Levels in onsite well MW-16S.

The site operated as a holder station from as early as 1923. In 1950, nine liquified petroleum gas (LPG) tanks were installed for gas vaporization. The holder was demolished in 1993. A natural gas metering and regulation station is in operation in the northeast corner of the site (AECOM 2015). The site is currently owned by National Grid.

The Inwood site is located approximately ¼-mile northwest of the Far Rockaway site. The results of the an informal well survey performed by AECOM for the Far Rockaway site are presented below and in Figure 24. There were multiple water supply wells located within a ½ mile of the site, however, the current status and use of these wells has not been identified. One public supply well location (NY0003913) was identified in a 2004 EDR Report (EDR 2004f), as shown in Figure 24. There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.12 Kings County Works MGP Site

The validated analytical results for the Kings County former MGP site compared against the NYSDEC Screening Levels are provided in Table 13. The groundwater monitoring well locations are provided in Figure 12.

The following three groundwater monitoring wells were sampled at the Kings County site:

- KC-MW-01: upgradient, on the eastern property line;
- KC-MW-05: onsite, located in the central portion of the site. KC-MW-05 was sampled in place of adjacent well KC-MW-04 due to NAPL observed at KC-MW-04; and
- KC-MW-09: downgradient, located on the western property line.

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Concentrations of PFOA were above the Groundwater Screening Level in upgradient well KC-MW-01 and onsite well KC-MW-05 and was above the Drinking Water Screening Level in downgradient well KC-MW-09. The highest PFAS concentrations were detected in onsite well KC-MW- 05 where PFBA, PFPeA, PFOA, and total PFAS were above the Groundwater Screening Levels. Total PFAS concentrations ranged from 128.55 ng/L at downgradient well KC-MW-09 to 3,783.2 ng/L at the duplicate sample of onsite well KC-MW-05. The concentration of 1,4-dioxane was above the Groundwater Screening Level in the upgradient well KC-MW-01.

The site operated as an MGP from approximately 1902 until 1951 when it converted to natural gas. The properties were sold in 1958 and 1960 and are not currently owned by National Grid. The properties have been used as a projectile works, a generating station, for meat sales, school lunch distribution, ship building, and as a lumber supply company (GEI 2016b).

There are no water supply wells within a ½ mile of the site (EDR 2010) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.13 Patchogue MGP Site

The validated analytical results for the Patchogue former MGP site compared against the NYSDEC Screening Levels are provided in Table 14. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 13.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Patchogue MGP site:

- MW-1: on-site upgradient well;
- MW-7S: on-site well; and
- MW-4S: on-site downgradient well.

Concentrations of PFOS were above the Groundwater Screening Level, in samples collected from downgradient well MW-4S and on-site well MW-7S. The concentration of total PFAS was above the Groundwater Screening Level in the sample collected from on-site well MW-7S. Total PFAS concentrations range from 73.34 ng/L in the upgradient location (MW-1) to 1,763.4 ng/L in the onsite location (MW-7S). Concentrations of 1,4-dioxane were not detected in any sample.

The site operated as an MGP primarily from approximately 1904 until 1914. High pressure gas purchased from Suffolk Gas & Electric (Bayshore) was distributed from the Patchogue Plant from 1915 through 1917. From 1922 through 1925, emergency gas production

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occurred at the site. The property was sold in 1976 and was used as a refrigeration scrap storage yard. The property was re-acquired by Key Span in 2005 and is now owned by National Grid (Tetra Tech, 2009).

The following information on water supply wells within a ½-mile of the Patchogue MGP site was obtained from the 2009 Final Remedial Investigation Report (Tetra Tech, 2009). A total of eight NYSDEC-registered private supply wells, one public water supply well, and three other wells are located within a 1/2-mile radius of the site. The location of each water supply well is shown in Figure 25. There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.14 Peoples Works MGP Site

The validated analytical results for the Peoples Works MGP site compared against the NYSDEC Screening Levels are provided in Table 15. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 14.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Peoples Works MGP site:

- PWMW-01: onsite upgradient well;
- MW-11: onsite well; and
- MW-09: onsite downgradient well.

Concentrations of PFOA were above the Drinking Water Screening Level, but are below the Groundwater Screening Level, in samples collected from upgradient well PWMW-01 and onsite well MW-11. The concentration of PFOS was above the Drinking Water Screening Level in the sample collected from upgradient well PWMW-01. Total PFAS concentrations range from 48.07 ng/L in the downgradient location (MW-09) to 109.12 ng/L in the upgradient location (PWMW-01). 1,4-Dioxane was not detected in any sample.

The site operated as an MGP from approximately 1868 until 1887. By the mid-1890s, The People's Gas Light Company had not been in operation for several years, and the property was to be sold. The property is not owned by National Grid. The properties have been used as a brewery, for truck loading, as lumber storage, as a sugar house, for other storage, and for manufacturing (Tetra Tech 2018).

There are no water supply wells within a ½ mile of the site (EDR, 2004g) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

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3.15 Rockaway Park MGP Site

The validated analytical results for the Rockaway Park MGP site compared against the NYSDEC Screening Levels are provided in Table 16. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 15.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Rockaway Park MGP site:

- MW-26S: off-site upgradient well, located on Beach 108th Street approximately 150 feet southeast of the site;
- RW-05A: on-site well, located near the downgradient property line; and
- MW-02S: off-site downgradient well, located on the north side of Beach Channel Drive approximately 75 feet north of the site.

The concentration of PFOS was above the Groundwater Screening Level and the concentration of PFOA was above the Drinking Water Screening Level, but is below the Groundwater Screening Level, in the sample collected from downgradient off-site well MW-02S. The concentration of PFBA was above the Groundwater Screening Level in the sample collected from RW-05A. There were no emerging contaminants detected at concentrations above the Screening Levels in upgradient well MW-26S. Total PFAS concentrations range from 78.84 ng/L in the upgradient location (MW-26S) to 361.06 ng/L in the downgradient location (MW-02S). 1,4-Dioxane was not detected in any sample.

The site operated as an MGP from the late 1870s until 1957 and was demolished in 1958. The property is owned by National Grid. (D&B, 2002b). The property has also been used as a former and current LIPA substations.

No water supply wells have been identified within a ½ mile of the site and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.16 Sag Harbor MGP Site

The validated analytical results for the Sag Harbor MGP site compared against the NYSDEC Screening Levels are provided in Table 17. The groundwater monitoring well locations are provided in Figure 16.

The following three groundwater monitoring wells identified in the Work Plan were sampled at the Sag Harbor MGP site:

- SHMW-13I: off-site upgradient well, located approximately 160 feet upgradient of the site;

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- SHMW-01IR: on-site well; and
- SHMW-03I: off-site downgradient well, located approximately 40 feet downgradient of the site.

Concentrations of PFAS were not detected at concentrations above the Screening Levels in any of the three wells. Total PFAS concentrations range from 30.95 ng/L in the downgradient location (SHMW-03I) to 51.51 ng/L in the upgradient location (SHMW-13I). Concentrations of 1,4-dioxane was not detected in any well.

The site operated as an MGP from 1859 until 1930. The property was used for natural gas storage after 1930. A 100,000-cubic foot spherical gas storage tank (a Hortonsphere), three high pressure gas tanks, a compressor station building, and associated gas lines were located on the property. These structures were removed during remediation of MGP impacts in 2008 and 2009 (D&B 2002c). The property is owned by National Grid.

The following information on water supply wells within a ½-mile of the Sag Harbor MGP site was obtained from the 2002 Site Remedial Investigation (D&B 2002c). A total of five NYSDEC-registered private supply wells are located within a 1/2-mile radius of the site. The location of each water supply well is shown in Figure 26. There were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.17 Skillman St. Station Site

The validated analytical results for the Skillman St. Station site compared against the NYSDEC Screening Levels are provided in Table 18. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 17.

The following two groundwater monitoring wells identified in the Work Plan were sampled at the Skillman St. Station site:

- SSMW-03: off-site upgradient well, located on Skillman Street approximately 60 feet upgradient of the site; and
- SSMW-05: off-site downgradient well, located on Bedford Avenue approximately 100 feet downgradient of the site.

Concentrations of PFOS were above the Drinking Water Screening Level, but are below the Groundwater Screening Level, in samples collected from both SSMW-03 and SSMW-05. Concentrations of PFOA were above the Groundwater Screening Level in samples collected from both SSMW-03 and SSMW-05. The concentration of total PFAS was above the Groundwater Screening Level in the sample collected from downgradient well SSMW-05. Total PFAS concentrations range from 390.14 ng/L in the upgradient location (SSMW-03,

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duplicate sample) to 816.78 ng/L in the downgradient location (SSMW-05). The concentration of 1,4-dioxane was above the Groundwater Screening Level in the sample collected from downgradient well SSMW-05.

The site operated as a holder station from the 1880s until demolition of the holder station by 1935. The property was sold in 1940 and is not owned by National Grid. The properties have also been used for automobile repair and painting, steel drum storage, as a warehouse, and for industrial uniform cleaning (GEI 2014a).

No water supply wells have been identified within a ½-mile of the site (EDR 2004h) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

3.18 Wythe Ave. Station Site

The validated analytical results for the Wythe Ave. Station site compared against the NYSDEC Screening Levels are provided in Table 19. The groundwater monitoring well locations and analytes detected at concentrations above the NYSDEC Screening Levels are provided in Figure 18.

The following two groundwater monitoring wells were sampled with respect to the Wythe Ave. Station site:

- WA-MW-04: off-site upgradient well, located on Berry Street approximately 60 feet north of the site; and
- WA-MW-01: off-site downgradient well, located on the Wythe Avenue sidewalk adjacent to the site. WA-MW-01 was sampled in place of nearby WA-MW-05 identified in the Work Plan based on concentrations of VOCs and SVOCs observed during the annual groundwater sampling event for the Wythe Ave. site at WA-MW-05.

Concentrations of PFOA were above the Drinking Water Screening Level, but are below the Groundwater Screening Level, in samples collected from both WA-MW-01 and WA-MW-04. Concentrations of PFBA, PFPeA, PFHxA, and total PFAS were above the Groundwater Screening Level in the sample collected from WA-MW-01. Total PFAS concentrations range from 183.79 ng/L in the downgradient location (WA-MW-01) to 678.77 ng/L in the upgradient location (WA-MW-04). The concentration of 1,4-dioxane was above the Groundwater Screening Level in the sample collected from WA-MW-04.

The site operated as a holder station from 1903 until demolition of the holder station 1965. The properties that make up the site were sold in 1965 and are not owned by National Grid. The properties have also been used for manufacturing, auto plating and processing, storage,

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and by Standard White Metals and Consolidated Edison of New York for unknown uses (GEI 2014b).

No water supply wells have been identified within a ½ mile of the site (EDR 2004i) and there were no water supply wells within a ½-mile of the site identified on NYSDEC's water well supply map for wells installed after April 2000.

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4. Summary of Findings

Groundwater sampling for emerging contaminants has been completed at 18 of the 24 downstate former MGP sites identified in the Work Plan. Groundwater samples were collected at a total of 54 wells and analyzed for PFAS and 1,4-dioxane. Two to five groundwater wells were selected for sampling at each site to represent upgradient, onsite and downgradient groundwater conditions, where possible.

1,4-Dioxane was detected at concentrations above the NYSDEC Initial Groundwater and Drinking Water Screening Level of 0.35 ug/L at 6 of the 18 sites, in a total of eight of the 54 wells sampled. Five sites (Coney Island, Inwood Holder, Kings County Works, Skillman St. Station and Wythe Ave. Station) had concentrations of 1,4-dioxane detected above the Screening Level in only one of the wells sampled at the site and one site (Equity Works) had concentrations of 1,4-dioxane detected in all three wells sampled at this site.

PFAS compounds were detected at concentrations above the NYSDEC Screening Levels at 16 of the 18 sites in 36 of the 54 wells sampled. The two sites that did not have PFAS compounds detected at concentrations above the Screening Levels were the Glen Cove and Sag Harbor sites. Of the 16 sites that had PFAS concentrations above the Screening Levels, 12 sites (20 wells) had concentrations above the higher Groundwater Screening Levels.

1,4-Dioxane is used primarily as a solvent in paints, varnishes, lacquers, cosmetics, deodorants, cleaning and detergent preparations, and in scintillating fluids and was not manufactured prior to 1951. PFAS are a large group of highly soluble manmade chemicals that have been widely used since the 1940s to make fluoropolymer coatings and are present in a multitude of everyday products more resistant to stains, grease, heat, and water.

PFAS and 1,4-dioxane are not associated with former MGP operations. Also, since 1,4-dioxane and PFAS were not in use prior to the 1950's or 1940's, respectively, it is highly unlikely that these chemicals were used at MGP sites. Many of the sites identified above have been sold and used for other purposes since their use as MGP sites and are located within highly industrial areas with many potential sources of the 1,4-dioxane and PFAS compounds.

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Tables

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Table 1. Summary of Groundwater Samples Collected
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Site Name	Sample Date	Wells Sampled	Screened Interval (ft-bgs)
Bay Ridge A Station	10/10/18	MW-112	68 - 78
		NA	NA
		MW-105	73 - 83
Bayshore MGP	9/24/18	MW-09I	30 - 40
		BBMW-41I	25 - 30
		MW-29S	5 - 10
		OU3MW-11S	2 - 12
		OU2MW-57I	20 - 30
Clifton MGP - Staten Island	10/2/18	RW-210I[1]	25-35
		RW-202S	10 - 20
		RW-23	3 - 13
Equity Works	10/12/18	MW-6B	30 - 40
		MW-8B	30 - 40
		MW-11B	33 - 43
Far Rockaway MGP	10/4/18	MW-116D	29.9 - 39.9
		MW-118DR	29 - 39
		MW-119D	26.5 - 36.5
Flatbush Station A&B	10/9/18	MW-2	47 - 57
		MW-4	47 - 57
		MW-7	47 - 57
Former Brooklyn Borough Gas Works (Coney Island)	10/5/18	MW-18	10 - 21
		MW-2	9 - 22
		MW-16	9 - 21
Fulton Works	10/11/18	FW-MW-19	5 - 15
		FW-MW-5R	10 - 20
		FW-MW-4[2]	3-13
		FW-MW-17	8-18
Glen Cove MGP	9/25/18	PZ06	7 - 17
		GCRW03	15 - 25
		GCMW14S-R	10 - 20
Greenpoint MGP - Energy Center	10/1/18	GPEC-MW-220I	40 - 50
		GPEC-MW-11	33 - 48
		GPEC-MW-3S	25 - 40
Inwood Holder	10/23/18	MW-52I[3]	13-23
		MW-16S[4]	2-11
		GW-8	1 - 11
Kings County Works	10/5/18	KC-MW-01	22 -32
		KC-MW-05[5]	5-15
		KC-MW-09	5 - 15
Patchogue MGP	9/25/18	MW-1	7 - 12
		MW-7S	4 - 9
		MW-4S	5 - 10
Peoples Works	9/26/18	PWMW-01	8 - 18
		MW-11	6 - 16
		MW-9	5 - 15
Rockaway Park MGP	9/28/18	MW-26S	3 - 13
		RW-05A	10 - 20
		MW-02S	5 - 15
Sag Harbor MGP	9/27/18	SHMW-13I	35 - 45
		SHMW-01IR	35 - 45
		SHMW-03I	35 - 45
Skillman St. Station	10/3/18	SSMW-03	12 - 22
		SSMW-05	11 - 21
		NA	NA
Wythe Ave. Station	10/3/18	WA-MW-04	9 - 19
		WA-MW-01[6]	8-18
		NA	NA

Notes:
1: RW-210I1(25-35) was sampled in place of RW-210S(15-25)
2: FW-MW-4(3-13) was sampled in place of FW-MW-4R(6-16)
3: MW-52I(13-23) was sampled in place of MW-52S(1-11)
4: MW-16S(2-11) was sampled in place of MW-19S(2-9)
5: KW-MW-05(5-15) was sampled in place of KW-MW-04(4-14)
6: WA-MW-01(8-18) was sampled in place of WA-MW-05(10-20)

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Table 2. Summary of Groundwater Analytical Results – Bay Ridge Holder Stations A & B Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-105 10/10/2018 73-83 Downgradient	Duplicate of MW-105 10/10/2018 73-83 Downgradient	MW-112 10/10/2018 68-78 On Site Upgradient
SVOCs (ug/L)					
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U
PFAS (ng/L)					
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	18.3 U	16.9 U	16.2 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	18.3 U	16.9 U	16.2 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**4.09**	**5.24**	**4.09**
Perfluorobutanoic acid (PFBA)	100	100	**11.5**	**11.7**	**100 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.83 U	1.69 U	1.62 U
Perfluorodecanoic acid (PFDA)	100	100	1.83 U	1.69 U	1.62 U
Perfluorododecanoic acid (PFDoA)	100	100	1.83 U	1.69 U	1.62 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.83 U	1.69 U	1.62 U
Perfluoroheptanoic acid (PFHpA)	100	100	**15.6**	**14.3**	**16.8**
Perfluorohexanoic acid (PFHxA)	100	100	**12.8**	**12.8**	**28.3**
Perfluorooctanesulfonamide (FOSA)	100	100	1.83 U	1.69 U	1.62 U
Perfluoropentanoic acid (PFPeA)	100	100	**12**	**11.9**	**16.6**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.83 U	1.69 U	1.62 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.83 U	1.69 U	1.62 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.83 U	1.69 U	1.62 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	18.3 U	16.9 U	16.2 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**7.15 J**	**6.82 J**	**9.5 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**2.38**	**2.88**	**6.06**
Perfluorononanoic acid (PFNA)	100	100	**1.27 J**	**1.13 J**	**0.89 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**6.7**	**6.95**	**2.56**
Perfluorooctanoic acid (PFOA)	20	70	**43.4**	**41.6**	**53.9**
Total PFAS	500	500	**116.89**	**115.32**	**238.7**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 3. Summary of Groundwater Analytical Results – Bay Shore MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	BBMW-41I 9/24/2018 25-30 On site OU1	MW-09I 9/24/2018 30-40 On site Upgradient OU1	MW-29S 9/24/2018 5-10 On site Upgradient OU3	Duplicate of MW-29S 9/24/2018 5-10 On site Upgradient OU3	OU2MW-57I 9/24/2018 20-30 On site Downgradient OU2	OU3MW-11S 9/24/2018 2-12 On site Downgradient OU3
SVOCs (ug/L)								
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)								
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.4 U	17.1 U	18.5 U	19.6 U	17.9 U	18.1 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	**0.47 J**	17.1 U	18.5 U	19.6 U	17.9 U	18.1 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**4.84**	**4.39**	**2.41**	**2.22**	**4.61**	**5.48**
Perfluorobutanoic acid (PFBA)	100	100	**4.2**	**2.09**	**12.8 J**	**12.8 J**	**30.9**	**23.2 J**
Perfluorodecane Sulfonic acid (PFDS)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	1.79 U	**0.91 J**
Perfluorodecanoic acid (PFDA)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	**0.46 J**	**1.91**
Perfluorododecanoic acid (PFDoA)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	1.79 U	1.81 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	1.79 U	1.81 U
Perfluoroheptanoic acid (PFHpA)	100	100	**5.27**	**4.7**	**4.2**	**4**	**4.86**	**4.99**
Perfluorohexanoic acid (PFHxA)	100	100	**5.26**	**5.04**	**3.81**	**3.36**	**4.15**	**7.68**
Perfluorooctanesulfonamide (FOSA)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	1.79 U	1.81 U
Perfluoropentanoic acid (PFPeA)	100	100	**4.59**	**4.43**	**2.8**	**4.23**	**8.56**	**4.3**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	1.79 U	1.81 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	1.79 U	1.81 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.74 U	1.71 U	1.85 U	1.96 U	**0.53 J**	**1.02 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.4 U	17.1 U	18.5 U	19.6 U	17.9 U	18.1 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	17.4 U	17.1 U	**2.69 J**	**1.98 J**	17.9 U	**1.46 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**2.64 J**	**5.3**	1.85 U	1.96 U	**8.17**	1.81 U
Perfluorononanoic acid (PFNA)	100	100	**1.96**	**1.27 J**	**1.41 J**	**1.46 J**	**1.54 J**	**3.11**
Perfluorooctanesulfonic acid (PFOS)	20	70	**30.9**	**13.6**	**5.99**	**6.44**	**26.2**	**18.7**
Perfluorooctanoic acid (PFOA)	20	70	**18.4**	**14.8**	**17**	**18.7**	**15**	**13.2**
Total PFAS	500	500	**79**	**55.62**	**53.11**	**55.19**	**104.98**	**85.96**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
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U = The result was not detected above the reporting limit.

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Table 4. Summary of Groundwater Analytical Results – Clifton MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	RW-23 10/2/2018 3-13 Downgradient Edgewater Plaza	RW-202S 10/2/2018 10-20 On site	Duplicate of RW-202S 10/2/2018 10-20 On site	RW-210I 10/2/2018 25-35 On site Upgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.21 U	0.21 U	0.21 U	0.21 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.5 U	16.8 U	17.8 U	17.7 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.5 U	16.8 U	17.8 U	17.7 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**14.3**	1.68 U	**1.43 J**	**0.39 J**
Perfluorobutanoic acid (PFBA)	100	100	**15.3**	**31.3**	**28.8**	1.77 U
Perfluorodecanesulfonic acid (PFDS)	100	100	1.75 U	1.68 U	1.78 U	1.77 U
Perfluorodecanoic acid (PFDA)	100	100	**2.06**	1.68 U	1.78 U	1.77 U
Perfluorododecanoic acid (PFDoA)	100	100	1.75 U	1.68 U	1.78 U	1.77 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.75 U	1.68 U	1.78 U	1.77 U
Perfluoroheptanoic acid (PFHpA)	100	100	**17.3**	1.68 U	**0.43 J**	1.77 U
Perfluorohexanoic acid (PFHxA)	100	100	**16.5**	1.68 U	**0.54 J**	1.77 U
Perfluorooctanesulfonamide (FOSA)	100	100	1.75 U	1.68 U	1.78 U	1.77 U
Perfluoropentanoic acid (PFPeA)	100	100	**19**	**7.59**	**8.16**	1.77 U
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.75 U	1.68 U	1.78 U	1.77 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.75 U	1.68 U	1.78 U	1.77 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.27 J**	1.68 U	**0.27 J**	**0.23 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.5 U	16.8 U	17.8 U	17.7 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	17.5 U	16.8 U	17.8 U	17.7 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**2.38**	1.68 U	1.78 U	1.77 U
Perfluorononanoic acid (PFNA)	100	100	**4.32**	1.68 U	1.78 U	1.77 U
Perfluorooctanesulfonic acid (PFOS)	20	70	**21.3**	1.68 U	1.78 U	1.77 U
Perfluorooctanoic acid (PFOA)	20	70	**95.7**	**1.58 J**	**2.4**	1.77 U
Total PFAS	500	500	**208.43**	**40.47**	**42.03**	**0.62**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
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Table 5. Summary of Groundwater Analytical Results – Equity Works MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-6B 10/12/2018 30-40 Upgradient	MW-8B 10/12/2018 30-40 On site	Duplicate of MW-8B 10/12/2018 30-40 On site	MW-11B 10/12/2018 33-43 Downgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	**0.73 J**	**0.43 J**	**0.53 J**	**1.1 J**
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	16.2 U	**0.75 J**	16.2 U	16 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	16.2 U	16.6 U	16.2 U	16 U
Perfluorobutanesulfonic acid (PFBS)	100	100	1.62 U	**9.03**	**11.5**	**16.7**
Perfluorobutanoic acid (PFBA)	100	100	**21.8 J**	**238 J**	**242 J**	**17.2 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.62 U	1.66 U	1.62 U	1.6 U
Perfluorodecanoic acid (PFDA)	100	100	1.62 U	**1.47 J**	**1.22 J**	1.6 U
Perfluorododecanoic acid (PFDoA)	100	100	1.62 U	1.66 U	1.62 U	1.6 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.62 U	**0.97 J**	**0.86 J**	1.6 U
Perfluoroheptanoic acid (PFHpA)	100	100	**3.48**	**54**	**45.8**	**3.1 J**
Perfluorohexanoic acid (PFHxA)	100	100	**2.91**	**78.4 J**	**75.6**	**8.24**
Perfluorooctanesulfonamide (FOSA)	100	100	1.62 U	**0.52 J**	1.62 U	1.6 U
Perfluoropentanoic acid (PFPeA)	100	100	**7.63**	**130 J**	**124 J**	**71**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.62 U	1.66 U	1.62 U	1.6 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.62 U	1.66 U	1.62 U	1.6 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.62 U	1.66 U	1.62 U	1.6 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	16.2 U	16.6 U	16.2 U	16 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**40.5 J**	**3.97 J**	**4.1 J**	16 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**1.43 J**	**20.2**	**18.7**	**2.8 J**
Perfluorononanoic acid (PFNA)	100	100	1.62 U	**6.92**	**6.37**	**0.35 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	1.62 U	**41.6**	**42.2**	1.6 U
Perfluorooctanoic acid (PFOA)	20	70	**11.8**	**105**	**118**	**7.69 J**
Total PFAS	500	500	**89.55**	**690.83**	**690.35**	**127.08**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
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Validation Qualifiers:
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Table 6. Summary of Groundwater Analytical Results – Far Rockaway MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-116D 10/4/2018 29.9-39.9 Upgradient	MW-118DR 10/4/2018 29-39 Near site	MW-119D 10/4/2018 26.5-36.5 Downgradient	Duplicate of MW-119D 10/4/2018 26.5-36.5 Downgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.4 U	17.2 U	16.3 U	16.5 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.4 U	17.2 U	16.3 U	16.5 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**2.8**	**3.34**	**2.2**	**2.39**
Perfluorobutanoic acid (PFBA)	100	100	**8.02**	**9.01**	**8.75**	**9.02**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.74 U	1.72 U	1.63 U	1.65 U
Perfluorodecanoic acid (PFDA)	100	100	1.74 U	**0.33 J**	**0.41 J**	**0.35 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.74 U	1.72 U	1.63 U	1.65 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**1.33 J**	**2.07**	**1.6 J**	**1.83**
Perfluoroheptanoic acid (PFHpA)	100	100	**11.8**	**14.5**	**9.58**	**9.8**
Perfluorohexanoic acid (PFHxA)	100	100	**16.1**	**15.8**	**10.7**	**10.6**
Perfluorooctanesulfonamide (FOSA)	100	100	1.74 U	1.72 U	1.63 U	1.65 U
Perfluoropentanoic acid (PFPeA)	100	100	**15.1**	**14**	**10**	**9.6**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.74 U	1.72 U	1.63 U	1.65 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.74 U	1.72 U	1.63 U	1.65 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.74 U	1.72 U	1.63 U	1.65 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.4 U	17.2 U	16.3 U	16.5 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**1.09 J**	17.2 U	16.3 U	16.5 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**14.8**	**22.5**	**17.1**	**17.6**
Perfluorononanoic acid (PFNA)	100	100	**1.21 J**	**1.94**	**1.71**	**1.48 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**40.4**	**125**	**48**	**46.5**
Perfluorooctanoic acid (PFOA)	20	70	**33.6**	**40.5**	**29.2**	**30.6**
Total PFAS	500	500	**146.25**	**248.99**	**139.25**	**139.77**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
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Validation Qualifiers:
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Table 7. Summary of Groundwater Analytical Results – Flatbush Stations A & B Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-2 10/9/2018 47-57 On site Upgradient	MW-4 10/9/2018 47-57 On site	MW-7 10/9/2018 47-57 On site Downgradient	Duplicate of MW-7 10/9/2018 47-57 On site Downgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	16.8 U	16.2 U	16.2 U	16.1 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	16.8 U	16.2 U	16.2 U	16.1 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**2.93**	**3.38**	**3.06**	**3.36**
Perfluorobutanoic acid (PFBA)	100	100	**10.7**	**22.4**	**5.7**	**6.78**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.68 U	1.62 U	**0.57 J**	**0.97 J**
Perfluorodecanoic acid (PFDA)	100	100	**0.74 J**	1.62 U	**1.49 J**	**1.49 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.68 U	1.62 U	1.62 U	1.61 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**0.99 J**	1.62 U	1.62 U	1.61 U
Perfluoroheptanoic acid (PFHpA)	100	100	**11.8**	**7.16**	**9.36**	**9.09**
Perfluorohexanoic acid (PFHxA)	100	100	**13**	**5.04**	**10.1**	**9.61**
Perfluorooctanesulfonamide (FOSA)	100	100	1.68 U	1.62 U	1.62 U	1.61 U
Perfluoropentanoic Acid (PFPeA)	100	100	**15.2**	**5**	**10.2**	**10.3**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.68 U	1.62 U	1.62 U	1.61 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	**0.22 J**	1.62 U	1.62 U	1.61 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.68 U	1.62 U	1.62 U	1.61 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	16.8 U	16.2 U	16.2 U	16.1 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**47.3 J**	**15.8 J**	**7.74 J**	**7.13 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**3.58**	**2.54**	**5.55**	**5.13**
Perfluorononanoic Acid (PFNA)	100	100	**3.01**	**1.31 J**	**4.06**	**3.83**
Perfluorooctanesulfonic acid (PFOS)	20	70	**37.1**	**23.4**	**31.6**	**32.2**
Perfluorooctanoic Acid (PFOA)	20	70	**65.7**	**53.5**	**57.3**	**57.9**
Total PFAS	500	500	**212.27**	**139.53**	**146.73**	**147.79**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 8. Summary of Groundwater Analytical Results – Former Brooklyn Borough Gas Works (Coney Island) MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-2 10/5/2018 9-22 On site	MW-16 10/5/2018 9-21 On site Downgradient	MW-18 10/5/2018 10-21 On site Upgradient	Duplicate of MW-18 10/5/2018 10-21 On site Upgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	**0.63**	**0.24**	**0.092 J**	**0.095 J**
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	85.6 U	**5.29 J**	**4.11 J**	**3.72 J**
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	85.6 U	85.2 U	19.4 U	19.4 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**7.33 J**	**27.5**	**6.66**	**6.18**
Perfluorobutanoic acid (PFBA)	100	100	**51.6**	**276**	**97.3 J**	**80 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	8.56 U	8.52 U	1.94 U	1.94 U
Perfluorodecanoic acid (PFDA)	100	100	8.56 U	8.52 U	**0.43 J**	**0.58 J**
Perfluorododecanoic acid (PFDoA)	100	100	8.56 U	8.52 U	1.94 U	1.94 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	8.56 U	**33.4**	**1.27 J**	**1.54 J**
Perfluoroheptanoic acid (PFHpA)	100	100	**22.8**	**50.9**	**15.2**	**16.1**
Perfluorohexanoic acid (PFHxA)	100	100	**43.5**	**44**	**11**	**12**
Perfluorooctanesulfonamide (FOSA)	100	100	8.56 U	8.52 U	**2.67**	**2.81**
Perfluoropentanoic acid (PFPeA)	100	100	**56.5**	**68.5**	**28.9**	**36.1 J**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	8.56 U	8.52 U	1.94 U	1.94 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	8.56 U	8.52 U	1.94 U	1.94 U
Perfluoroundecanoic acid (PFUnA)	100	100	8.56 U	8.52 U	1.94 U	1.94 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	85.6 U	85.2 U	19.4 U	19.4 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	85.6 U	85.2 U	19.4 U	19.4 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**18.9**	**181**	**12.9**	**11.1**
Perfluorononanoic acid (PFNA)	100	100	**11.6**	**11.7**	**2.6**	**2.59**
Perfluorooctanesulfonic acid (PFOS)	20	70	**45.6**	**898**	**87.3**	**88**
Perfluorooctanoic acid (PFOA)	20	70	**137**	**487**	**107**	**97.4**
Total PFAS	500	500	**394.83**	**2083.29**	**377.34**	**358.12**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 9. Summary of Groundwater Analytical Results – Fulton Works MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	FW-MW-4 10/11/2018 3-13 Downgradient	FW-MW-5R 10/11/2018 10-20 Near site	FW-MW-17 10/11/2018 8-18 Downgradient	FW-MW-19 10/11/2018 5-15 Upgradient	Duplicate of FW-MW-19 10/11/2018 5-15 Upgradient
SVOCs (ug/L)							
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)							
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	16.1 U	16 U	16.1 U	16.2 U	16.2 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	16.1 U	16 U	16.1 U	**0.39 J**	16.2 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**9.44**	**2.33**	**10.7**	**2.03 J**	**4 J**
Perfluorobutanoic acid (PFBA)	100	100	**36.1 J**	**13**	**83.9 J**	**52**	**53.7 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.61 U	1.6 U	1.61 U	**0.58 J**	1.62 U
Perfluorodecanoic acid (PFDA)	100	100	1.61 U	1.6 U	**0.43 J**	**0.49 J**	**0.32 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.61 U	1.6 U	1.61 U	**0.38 J**	1.62 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**1.12 J**	1.6 U	1.61 U	1.62 U	1.62 U
Perfluoroheptanoic acid (PFHpA)	100	100	**12.3**	**4.76**	**49.5**	**292**	**261**
Perfluorohexanoic acid (PFHxA)	100	100	**11.3**	**3.41**	**31.2**	**106**	**100**
Perfluorooctanesulfonamide (FOSA)	100	100	1.61 U	1.6 U	1.61 U	1.62 U	1.62 U
Perfluoropentanoic acid (PFPeA)	100	100	**21.2**	**3.33**	**53.1**	**80.4**	**71.8**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.61 U	1.6 U	1.61 U	1.62 U	1.62 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.61 U	1.6 U	1.61 U	**0.21 J**	1.62 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.61 U	1.6 U	1.61 U	1.62 U	1.62 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	16.1 U	16 U	16.1 U	16.2 U	16.2 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**3.35 J**	**1.15 J**	**11 J**	**4.41 J**	**6.92 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**2.99**	**0.36 J**	**1.16 J**	**1.46 J**	**1.89**
Perfluorononanoic acid (PFNA)	100	100	**2.82**	**0.43 J**	**4.6**	**8.62**	**8.07**
Perfluorooctanesulfonic acid (PFOS)	20	70	**34.8**	1.6 U	**13.3**	**6.92**	**6.79**
Perfluorooctanoic acid (PFOA)	20	70	**135**	**36.9**	**221**	**115**	**103**
Total PFAS	500	500	**270.42**	**65.67**	**479.89**	**670.89**	**617.49**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 10. Summary of Groundwater Analytical Results – Glen Cove MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	GCMW14S-R 9/25/2018 10-20 On site Downgradient	GCRW03 9/25/2018 15-25 On site	PZ06 9/25/2018 7-17 On site Upgradient	Duplicate of PZ06 9/25/2018 7-17 On site Upgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.7 U	18.3 U	17.6 U	17 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.7 U	18.3 U	17.6 U	17 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**9.38 J**	1.83 U	**3.1 J**	**2.43 J**
Perfluorobutanoic acid (PFBA)	100	100	**5.33 J**	**4.98 J**	**3.33 J**	**3.41 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.77 U	**0.48 J**	1.76 U	**0.48 J**
Perfluorodecanoic acid (PFDA)	100	100	1.77 U	**1.92**	1.76 U	1.7 U
Perfluorododecanoic acid (PFDoA)	100	100	1.77 U	**0.52 J**	1.76 U	1.7 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**0.72 J**	**0.86 J**	**0.87 J**	**0.85 J**
Perfluoroheptanoic acid (PFHpA)	100	100	**6.83**	**2.14**	**2.3**	**2.41**
Perfluorohexanoic acid (PFHxA)	100	100	**8.06**	**2.75 J**	**2.62 J**	**1.9 J**
Perfluorooctanesulfonamide (FOSA)	100	100	1.77 U	1.83 U	1.76 U	1.7 U
Perfluoropentanoic acid (PFPeA)	100	100	**7.41**	**4.22**	**3.66**	**3.02**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.77 U	1.83 U	1.76 U	1.7 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.77 U	1.83 U	1.76 U	1.7 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.77 U	1.83 U	1.76 U	1.7 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.7 U	18.3 U	17.6 U	17 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**1.31 J**	18.3 U	**4.64 J**	**5.08 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**2.87 J**	1.83 U	**6.24**	**6.32**
Perfluorononanoic acid (PFNA)	100	100	**0.92 J**	**1.32 J**	**1.08 J**	**1.19 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**6.14 J**	**3.17 J**	**9.67 J**	**8.52 J**
Perfluorooctanoic acid (PFOA)	20	70	**17.4**	**2.38**	**11.3**	**12.4**
Total PFAS	500	500	**66.37**	**24.74**	**48.81**	**48.01**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppb)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 11. Summary of Groundwater Analytical Results – Greenpoint MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	GPEC-MW-220I 10/1/2018 40-50 On site Upgradient	GPEC-MW-11 10/1/2018 33-48 On site	GPEC-MW-3S 10/1/2018 25-40 On site Downgradient	Duplicate of GPEC-MW-3S 10/1/2018 25-40 On site Downgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.6 U	17.8 U	17.6 U	17.4 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.6 U	17.8 U	17.6 U	17.4 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**5.18**	**2.11**	**1.3 J**	**1.08 J**
Perfluorobutanoic acid (PFBA)	100	100	**17.8**	**19.1**	**9.82 J**	**9.9 J**
Perfluorodecane Sulfonic acid (PFDS)	100	100	1.76 U	1.78 U	1.76 U	1.74 U
Perfluorodecanoic acid (PFDA)	100	100	**0.34 J**	**1.31 J**	**2.11**	**2.08**
Perfluorododecanoic acid (PFDoA)	100	100	1.76 U	1.78 U	1.76 U	1.74 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**0.79 J**	1.78 U	1.76 U	1.74 U
Perfluoroheptanoic acid (PFHpA)	100	100	**14.9**	**6.56**	**2.01**	**1.9**
Perfluorohexanoic acid (PFHxA)	100	100	**17**	**5.31**	**1.04 J**	**1.57 J**
Perfluorooctanesulfonamide (FOSA)	100	100	1.76 U	1.78 U	1.76 U	1.74 U
Perfluoropentanoic acid (PFPeA)	100	100	**19.6**	**3.03**	**3.66**	**3.76**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.76 U	1.78 U	1.76 U	1.74 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.76 U	**0.34 J**	1.76 U	1.74 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.26 J**	**1.14 J**	**0.55 J**	**0.32 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.6 U	17.8 U	17.6 U	17.4 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	17.6 U	17.8 U	17.6 U	17.4 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**22.4**	1.78 U	1.76 U	1.74 U
Perfluorononanoic acid (PFNA)	100	100	**2.5**	**1.01 J**	**1.9**	**2.35**
Perfluorooctanesulfonic acid (PFOS)	20	70	**57.9**	**3.1**	**11**	**10.5**
Perfluorooctanoic acid (PFOA)	20	70	**97.5**	**8.54**	**29.4**	**29.4**
Total PFAS	500	500	**256.17**	**51.55**	**62.79**	**62.86**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 12. Summary of Groundwater Analytical Results – Inwood Holder Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	GW-8 10/23/2018 1-11 On site Downgradient	MW-16S 10/23/2018 2-11 On site	Duplicate of MW-16S 10/23/2018 2-11 On site	MW-52I 10/23/2018 13-23 On site Upgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	**0.49 J**	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	16.6 U	16.4 U	16.4 U	16.8 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	16.6 U	16.4 U	16.4 U	16.8 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**8.79**	**0.45 J**	**0.6 J**	**11.4**
Perfluorobutanoic acid (PFBA)	100	100	**20.9 J**	**21.4**	**23.3**	**42.3 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.66 U	1.64 U	1.64 U	1.68 U
Perfluorodecanoic acid (PFDA)	100	100	1.66 U	1.64 U	1.64 U	**1.38 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.66 U	1.64 U	1.64 U	1.68 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.66 U	1.64 U	1.64 U	**1.29 J**
Perfluoroheptanoic acid (PFHpA)	100	100	**9.84**	**0.78 J**	**0.76 J**	**13.1**
Perfluorohexanoic acid (PFHxA)	100	100	**6.58**	**1.9**	**2.24**	**18.4**
Perfluorooctanesulfonamide (FOSA)	100	100	1.66 U	1.64 U	1.64 U	1.68 U
Perfluoropentanoic acid (PFPeA)	100	100	**40.3 J**	**9.61**	**10.4**	**21.1**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.66 U	1.64 U	1.64 U	1.68 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.66 U	1.64 U	1.64 U	1.68 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.23 J**	**0.26 J**	1.64 U	**0.59 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	16.6 UJ	16.4 UJ	16.4 UJ	16.8 UJ
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	16.6 U	16.4 U	16.4 U	**1.96 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**1.74**	1.64 U	1.64 U	**8.78**
Perfluorononanoic acid (PFNA)	100	100	**0.31 J**	1.64 U	1.64 U	**5.08**
Perfluorooctanesulfonic acid (PFOS)	20	70	**1.98**	1.64 U	1.64 U	**74.2**
Perfluorooctanoic acid (PFOA)	20	70	**48.3**	**2.81**	**2.73**	**38.1**
Total PFAS	500	500	**138.97**	**37.21**	**40.03**	**237.68**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.
UJ = The results was not detected at or above the reporting limit shown and the reporting limit is estimated.

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Table 13. Summary of Groundwater Analytical Results – Kings County Works MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Location Name	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	KC-MW-01 10/5/2018 22-23 Upgradient	KC-MW-05 10/5/2018 6-16 On site	Duplicate of KC-MW-05 10/5/2018 6-16 On site	KC-MW-09 10/5/2018 5-15 Downgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	**0.57 J**	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	16.7 U	196 U	192 U	16.1 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	16.7 U	196 U	192 U	16.1 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**2.74**	**93.7**	**96.9**	**2.41**
Perfluorobutanoic acid (PFBA)	100	100	**10.9**	**2940 J**	**3210 J**	**28.3**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Perfluorodecanoic acid (PFDA)	100	100	1.67 U	19.6 U	19.2 U	**0.54 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Perfluoroheptanoic acid (PFHpA)	100	100	**25.2**	**33.2 J**	**28.1 J**	**9.91**
Perfluorohexanoic acid (PFHxA)	100	100	**18.3**	19.6 U	**11.1 J**	**7.9**
Perfluorooctanesulfonamide (FOSA)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Perfluoropentanoic acid (PFPeA)	100	100	**15.9**	**243**	**221**	**19.5**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.67 U	19.6 U	19.2 U	1.61 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	16.7 U	196 U	192 U	16.1 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**1.08 J**	**21.8 J**	**32 J**	**2.36 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**2.44**	19.6 U	19.2 U	**1.5 J**
Perfluorononanoic acid (PFNA)	100	100	**2.9**	**34.1**	**30.1**	**5.43**
Perfluorooctanesulfonic acid (PFOS)	20	70	**5.52**	19.6 U	19.2 U	**6**
Perfluorooctanoic acid (PFOA)	20	70	**86.7**	**155 J**	**154 J**	**44.7**
Total PFAS	500	500	**171.68**	**3520.8**	**3783.2**	**128.55**

Notes:
Analytes in blue are not detected in any sample
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation ground water initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 14. Summary of Groundwater Analytical Results – Patchogue MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Location Name	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-1 9/25/2018 7-12 On site Upgradient	MW-4S 9/25/2018 5-10 On site Downgradient	MW-7S 9/25/2018 4-9 On site	Duplicate of MW-7S 9/25/2018 4-9 On site
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	**2.21 J**	17.6 U	**7.76 J**	**7.59 J**
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.4 U	17.6 U	17.9 U	18 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**9.02 J**	**18**	**20.8**	**21**
Perfluorobutanoic acid (PFBA)	100	100	**25**	**3.73 J**	**8.82**	**7.44 J**
Perfluorodecane Sulfonic acid (PFDS)	100	100	1.74 U	**0.47 J**	1.79 U	1.8 U
Perfluorodecanoic acid (PFDA)	100	100	**2.05**	**0.56 J**	**0.72 J**	**0.81 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.74 U	**0.32 J**	1.79 U	1.8 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.74 U	**2.82**	**11.7**	**14.6**
Perfluoroheptanoic acid (PFHpA)	100	100	**2.86**	**3.67**	**6.96**	**6.08**
Perfluorohexanoic acid (PFHxA)	100	100	**6.37**	**2.96 J**	**9.05**	**9.89**
Perfluorooctanesulfonamide (FOSA)	100	100	**0.74 J**	1.76 U	1.79 U	**0.83 J**
Perfluoropentanoic acid (PFPeA)	100	100	**3.48 J**	**3.88**	**5.12 J**	**8.88 J**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.74 U	1.76 U	1.79 U	1.8 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.74 U	**0.27 J**	1.79 U	1.8 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.75 J**	**0.27 J**	1.79 U	1.8 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.4 U	17.6 U	17.9 U	18 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**0.99 J**	17.6 U	17.9 U	**1.03 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	1.74 U	**22.2**	**44.6**	**41**
Perfluorononanoic acid (PFNA)	100	100	**2.48**	**0.75 J**	**1.13 J**	**1.34 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**13.3 J**	**91.8**	**1630 J**	**1170 J**
Perfluorooctanoic acid (PFOA)	20	70	**4.09**	**12.5**	**16.7**	**17.2**
Total PFAS	500	500	**73.34**	**164.2**	**1763.36**	**1307.69**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or patrs per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 15. Summary of Groundwater Analytical Results – Peoples Works MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-9 9/26/2018 5-15 On site Downgradient	MW-11 9/26/2018 6-16 On site	Duplicate of MW-11 9/26/2018 6-16 On site	PWMW-01 9/26/2018 8-18 On site Upgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.21 U	0.21 U	0.21 U	0.21 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.3 U	17.5 U	17.6 U	17.2 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.3 U	17.5 U	17.6 U	17.2 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**2.9 J**	**11 J**	**9.87 J**	**4.7 J**
Perfluorobutanoic acid (PFBA)	100	100	1.73 U	**14**	**14.1**	**4.14 J**
Perfluorodecane Sulfonic acid (PFDS)	100	100	**3.81**	1.75 U	1.76 U	1.72 U
Perfluorodecanoic acid (PFDA)	100	100	**1.84**	1.75 U	1.76 U	1.72 U
Perfluorododecanoic acid (PFDoA)	100	100	**1.96**	1.75 U	1.76 U	1.72 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.73 U	1.75 U	**1.15 J**	1.72 U
Perfluoroheptanoic acid (PFHpA)	100	100	**2.2**	**4.12**	**4.26**	**8.92**
Perfluorohexanoic acid (PFHxA)	100	100	**3.44 J**	**5.85**	**6.66**	**8.65**
Perfluorooctanesulfonamide (FOSA)	100	100	**1.43 J**	1.75 U	1.76 U	1.72 U
Perfluoropentanoic acid (PFPeA)	100	100	**3.78**	**12.8**	**15.6**	**15.9**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	**0.94 J**	1.75 U	1.76 U	1.72 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	**2.7**	1.75 U	1.76 U	1.72 U
Perfluoroundecanoic acid (PFUnA)	100	100	**1.83**	**0.23 J**	1.76 U	1.72 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.3 U	17.5 U	17.6 U	17.2 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**2.65 J**	17.5 U	17.6 U	17.2 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	1.73 U	1.75 U	1.76 U	**2.27 J**
Perfluorononanoic acid (PFNA)	100	100	**0.84 J**	**1.32 J**	**1.17 J**	**1.54 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**10.6 J**	**3.14 J**	**2.39 J**	**20.4**
Perfluorooctanoic acid (PFOA)	20	70	**7.15**	**38.4**	**38.1**	**42.6**
Total PFAS	500	500	**48.07**	**90.86**	**93.3**	**109.12**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 16. Summary of Groundwater Analytical Results – Rockaway Park MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-02S 9/28/2018 5-15 Downgradient	MW-26S 9/28/2018 3-13 Upgradient	RW-05A 9/28/2018 10-20 On site	Duplicate of RW-05A 9/28/2018 10-20 On site
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.2 U	0.2 U	0.2 U	0.2 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.2 U	17.6 U	17.6 U	17.5 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.2 U	17.6 U	17.6 U	17.5 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**11.5**	**3.76**	**2.57 J**	**6.25 J**
Perfluorobutanoic acid (PFBA)	100	100	**77 J**	**24.4**	**148 J**	**115 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	**0.96 J**	1.76 U	1.76 U	1.75 U
Perfluorodecanoic acid (PFDA)	100	100	**4.18**	1.76 U	**0.65 J**	**0.72 J**
Perfluorododecanoic acid (PFDoA)	100	100	1.72 U	1.76 U	1.76 U	1.75 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**2.15**	1.76 U	1.76 U	1.75 U
Perfluoroheptanoic acid (PFHpA)	100	100	**11.5**	**3.79**	**4.68 J**	**3.74**
Perfluorohexanoic acid (PFHxA)	100	100	**20**	**4.82**	**7.39 J**	**3.9 J**
Perfluorooctanesulfonamide (FOSA)	100	100	**0.57 J**	1.76 U	1.76 U	1.75 U
Perfluoropentanoic acid (PFPeA)	100	100	**25.2**	**6.58**	**12.7**	**16.8**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.72 U	1.76 U	1.76 U	1.75 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.72 U	1.76 U	1.76 U	1.75 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.9 J**	**0.23 J**	**0.39 J**	**0.39 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.2 U	17.6 U	17.6 U	17.5 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	17.2 U	17.6 U	17.6 U	17.5 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**22.5**	**2.48 J**	8.8 U	**3.82**
Perfluorononanoic acid (PFNA)	100	100	**10.7**	**1.08 J**	**1.53 J**	**1.28 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**122 J**	**13.6**	**8.99**	**9.15**
Perfluorooctanoic acid (PFOA)	20	70	**51.9**	**18.1**	**15.5**	**17.5**
Total PFAS	500	500	**361.06**	**78.84**	**202.4**	**178.55**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 17. Summary of Groundwater Analytical Results – Sag Harbor MGP Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	SHMW-01R 9/27/2018 35-45 On site	SHMW-03I 9/27/2018 35-45 Downgradient	SHMW-13I 9/27/2018 35-45 Upgradient	Duplicate of SHMW-13I 9/27/2018 35-45 Upgradient
SVOCs (ug/L)						
1,4-Dioxane	0.35	0.35	0.21 U	0.21 U	0.21 U	0.21 U
PFAS (ng/L)						
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	16.7 U	17.1 U	17.4 U	17.7 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	16.7 U	17.1 U	17.4 U	17.7 U
Perfluorobutanesulfonic acid (PFBS)	100	100	1.67 U	1.71 U	**4.28**	**2.85 J**
Perfluorobutanoic acid (PFBA)	100	100	**6.01 J**	**3.58 J**	**6.37 J**	**5.92 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.67 U	1.71 U	1.74 U	1.77 U
Perfluorodecanoic acid (PFDA)	100	100	1.67 U	1.71 U	**0.4 J**	1.77 U
Perfluorododecanoic acid (PFDoA)	100	100	1.67 U	1.71 U	1.74 U	1.77 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**0.75 J**	1.71 U	**0.8 J**	**0.76 J**
Perfluoroheptanoic acid (PFHpA)	100	100	**2.6**	**1.81**	**3.23**	**3.81**
Perfluorohexanoic acid (PFHxA)	100	100	**2.2**	**2.03**	**5.03**	**4.53**
Perfluorooctanesulfonamide (FOSA)	100	100	1.67 U	1.71 U	1.74 U	1.77 U
Perfluoropentanoic acid (PFPeA)	100	100	**2.7**	**2.44**	**6.44**	**5.99**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.67 U	1.71 U	1.74 U	1.77 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.67 U	1.71 U	1.74 U	1.77 U
Perfluoroundecanoic acid (PFUnA)	100	100	1.67 U	1.71 U	1.74 U	1.77 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	16.7 U	17.1 U	17.4 U	17.7 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	16.7 U	17.1 U	17.4 U	17.7 U
Perfluorohexanesulfonic acid (PFHxS)	100	100	**4.79**	**4.69**	**4.76**	**4.08**
Perfluorononanoic acid (PFNA)	100	100	**4.29**	1.71 U	1.74 U	1.77 U
Perfluorooctanesulfonic acid (PFOS)	20	70	**10.7**	**8.99**	**9.9**	**9.61**
Perfluorooctanoic acid (PFOA)	20	70	**10.3**	**7.41**	**10.3**	**10.8**
Total PFAS	500	500	**44.34**	**30.95**	**51.51**	**48.35**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

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Table 18. Summary of Groundwater Analytical Results – Skillman St. Station Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Sample Location	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	SSMW-03 10/3/2018 12-22 Upgradient	Duplicate of SSMW-03 10/3/2018 12-22 Upgradient	SSMW-05 10/3/2018 11-21 Downgradient
SVOCs (ug/L)					
1,4-Dioxane	0.35	0.35	0.21 U	0.21 U	**0.42 J**
PFAS (ng/L)					
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.6 U	17.4 U	17.8 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	**0.45 J**	17.4 U	17.8 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**10.8**	**9.81**	**14.7**
Perfluorobutanoic acid (PFBA)	100	100	**48.5**	**55.9 J**	**83.8**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.76 U	1.74 U	1.78 U
Perfluorodecanoic acid (PFDA)	100	100	**0.7 J**	**0.83 J**	**5.36**
Perfluorododecanoic acid (PFDoA)	100	100	1.76 U	1.74 U	1.78 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	**1.55 J**	**1.07 J**	**1.05 J**
Perfluoroheptanoic acid (PFHpA)	100	100	**44.6**	**43.4**	**91**
Perfluorohexanoic acid (PFHxA)	100	100	**73.3**	**73.9**	**208**
Perfluorooctanesulfonamide (FOSA)	100	100	1.76 U	1.74 U	**1.02 J**
Perfluoropentanoic acid (PFPeA)	100	100	**69.3 J**	**61.4**	**164**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.76 U	1.74 U	1.78 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.76 U	1.74 U	1.78 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.28 J**	**0.29 J**	**0.36 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.6 U	17.4 U	17.8 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**3.41 J**	**1.63 J**	**5.02 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**3.91**	**3.34**	**9.72**
Perfluorononanoic acid (PFNA)	100	100	**6.55**	**5.67**	**8.05**
Perfluorooctanesulfonic acid (PFOS)	20	70	**42.4**	**40.8**	**44.7 J**
Perfluorooctanoic acid (PFOA)	20	70	**106**	**92.1**	**180**
Total PFAS	500	500	**411.75**	**390.14**	**816.78**

Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
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Table 19. Summary of Groundwater Analytical Results – Wythe Ave. Site
Emerging Contaminant Groundwater Sampling Report
National Grid
Brooklyn, Queens, and Long Island, NY

Sample Name Sample Date Sample Depth (feet) Location Name	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	WA-MW-01 10/3/2018 8-18 Downgradient	WA-MW-04 10/3/2018 9-19 Upgradient	Duplicate of WA-MW-04 10/3/2018 9-19 Upgradient
SVOCs (ug/L)					
1,4-Dioxane	0.35	0.35	0.21 U	**0.55 J**	**0.55 J**
PFAS (ng/L)					
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	100	100	17.7 U	18 U	17.7 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	100	100	17.7 U	18 U	17.7 U
Perfluorobutanesulfonic acid (PFBS)	100	100	**7.11**	**7.15**	**8.5**
Perfluorobutanoic acid (PFBA)	100	100	**177 J**	**46.8 J**	**56.9 J**
Perfluorodecanesulfonic acid (PFDS)	100	100	1.77 U	1.8 U	1.77 U
Perfluorodecanoic acid (PFDA)	100	100	1.77 U	1.8 U	1.77 U
Perfluorododecanoic acid (PFDoA)	100	100	1.77 U	1.8 U	1.77 U
Perfluoroheptanesulfonic acid (PFHpS)	100	100	1.77 U	1.8 U	**0.78 J**
Perfluoroheptanoic acid (PFHpA)	100	100	**30.6**	**15.9**	**18.5**
Perfluorohexanoic acid (PFHxA)	100	100	**272**	**17.2**	**19**
Perfluorooctanesulfonamide (FOSA)	100	100	1.77 U	1.8 U	1.77 U
Perfluoropentanoic acid (PFPeA)	100	100	**149**	**21.8**	**19.1**
Perfluorotetradecanoic acid (PFTA/PFTeDA)	100	100	1.77 U	1.8 U	1.77 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)	100	100	1.77 U	1.8 U	1.77 U
Perfluoroundecanoic acid (PFUnA)	100	100	**0.22 J**	**0.37 J**	1.77 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	100	100	17.7 U	18 U	17.7 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	100	100	**1.08 J**	**2.08 J**	**2.07 J**
Perfluorohexanesulfonic acid (PFHxS)	100	100	**0.58 J**	**1.96**	**2.31**
Perfluorononanoic acid (PFNA)	100	100	**2.68**	**1.24 J**	**1.61 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**15.4**	**3.39**	**3.92**
Perfluorooctanoic acid (PFOA)	20	70	**23.1**	**65.9**	**69.8**
Total PFAS	500	500	**678.77**	**183.79**	**202.49**

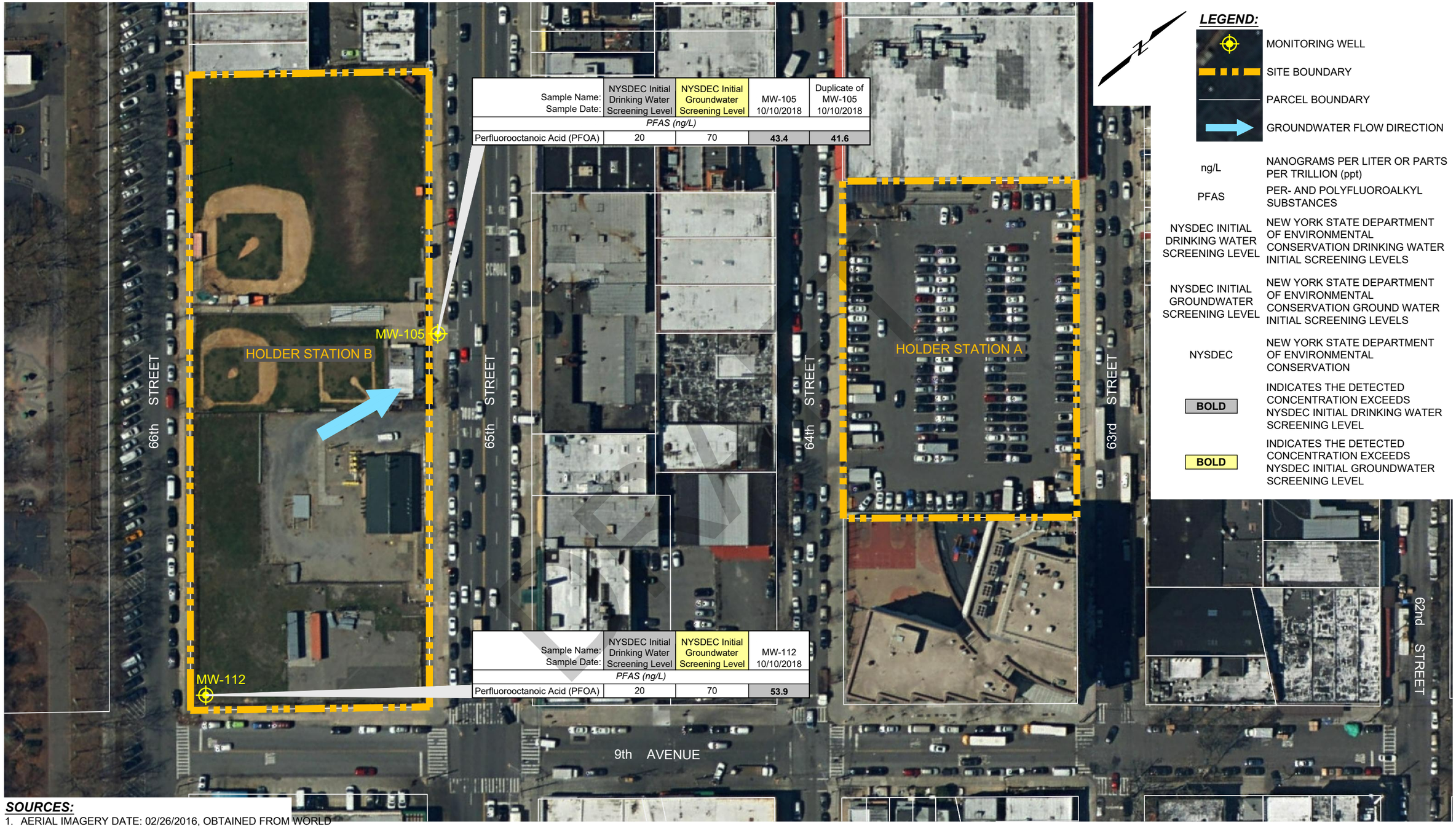
Notes:
Analytes in blue are not detected in any sample.
ng/L = nanogram per liter or parts per trillion (ppt)
ug/L = micrograms per liter or parts per billion (ppb)
PFAS = Per- and polyfluoroalkyl substances
SVOC = Semi-Volatile Organic Compound
Total PFAS are calculated using detects only.
NYSDEC Initial Drinking Water Screening Level - New York State Department of Environmental Conservation drinking water initial screening levels.
NYSDEC Initial Groundwater Screening Level - New York State Department of Environmental Conservation groundwater initial screening levels.
NYSDEC = New York State Department of Environmental Conservation
Bolding indicates a detected result concentration.
Shading and bolding indicates that the detected concentration is above the NYSDEC screening level it was compared to.

Validation Qualifiers:
J = The result is an estimated value.
U = The result was not detected above the reporting limit.

DRAFT

Figures

DRAFT



Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-105 10/10/2018	Duplicate of MW-105 10/10/2018
PFAS (ng/L)				
Perfluorooctanoic Acid (PFOA)	20	70	**43.4**	**41.6**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-112 10/10/2018
PFAS (ng/L)			
Perfluorooctanoic Acid (PFOA)	20	70	**53.9**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCES:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIGURE 2: LOCATION OF MONITORING WELLS, FORMER BAY RIDGE HOLDER STATION A & B SITE, OPERABLE UNIT 2,* PREPARED BY AECOM, DATE: 12/30/15.
3. *FIGURE 1-6: GROUNDWATER CONTOURS,* PREPARED BY AECOM, DATE: 9/26/14 (GROUNDWATER CONTOURS DATED 10/10/13).

0 80 160

SCALE: 1" = 80'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

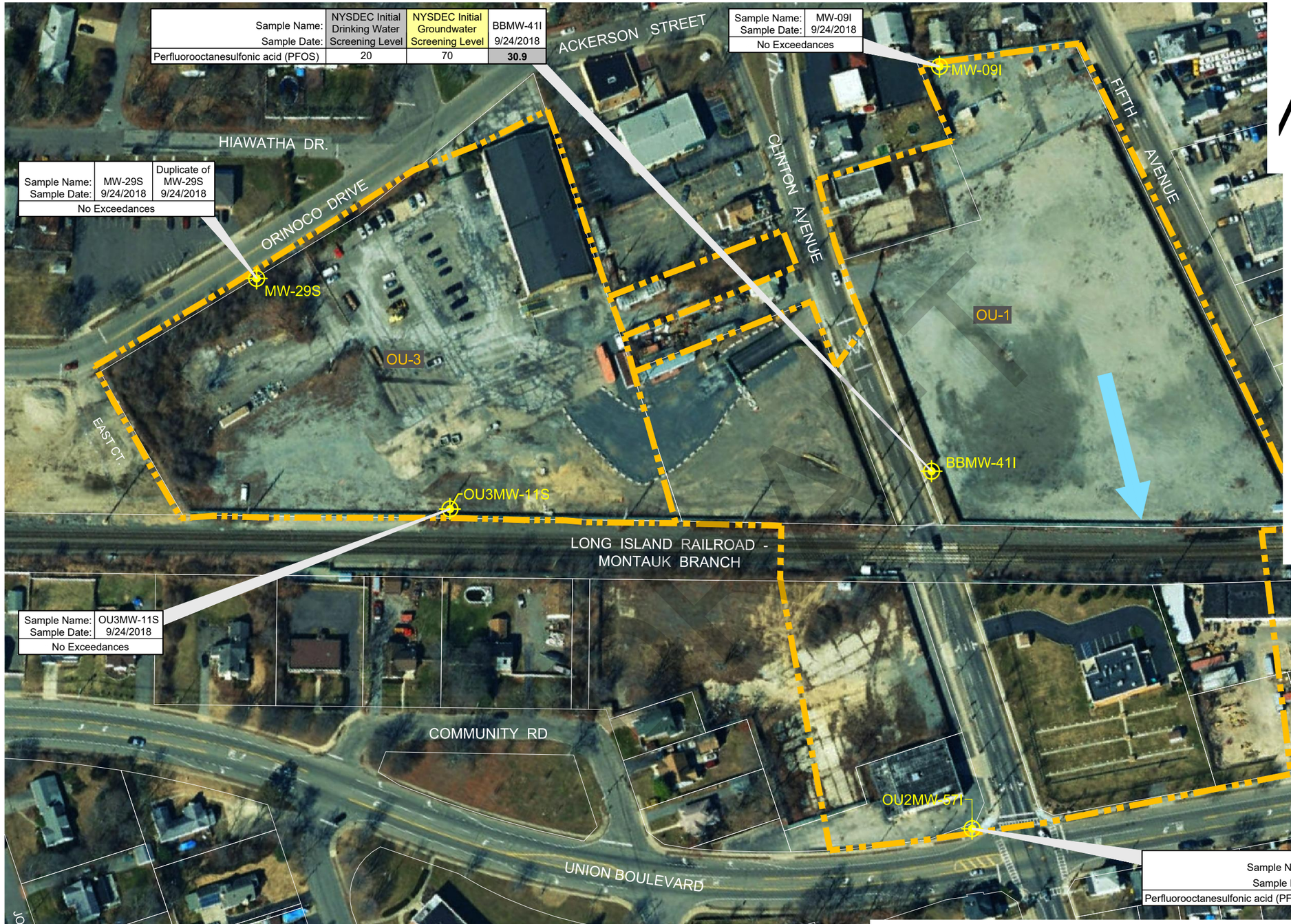
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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - BAY RIDGE HOLDER STATIONS A & B

Project 1802728 | February 2019 | Fig. 1

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Sample Name:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	BBMW-41I
Sample Date:			9/24/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**30.9**

Sample Name:	MW-09I
Sample Date:	9/24/2018
No Exceedances	

Sample Name:	MW-29S	Duplicate of MW-29S
Sample Date:	9/24/2018	9/24/2018
No Exceedances		

Sample Name:	OU3MW-11S
Sample Date:	9/24/2018
No Exceedances	

Sample Name:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	OU2MW-57I
Sample Date:			9/24/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**26.2**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIG. 8 SHALLOW GROUNDWATER CONTOUR MAP,* PREPARED BY GEI CONSULTANTS, INC., DATE: SEPTEMBER 2017.

0 120 240

SCALE: 1" = 120'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

nationalgrid

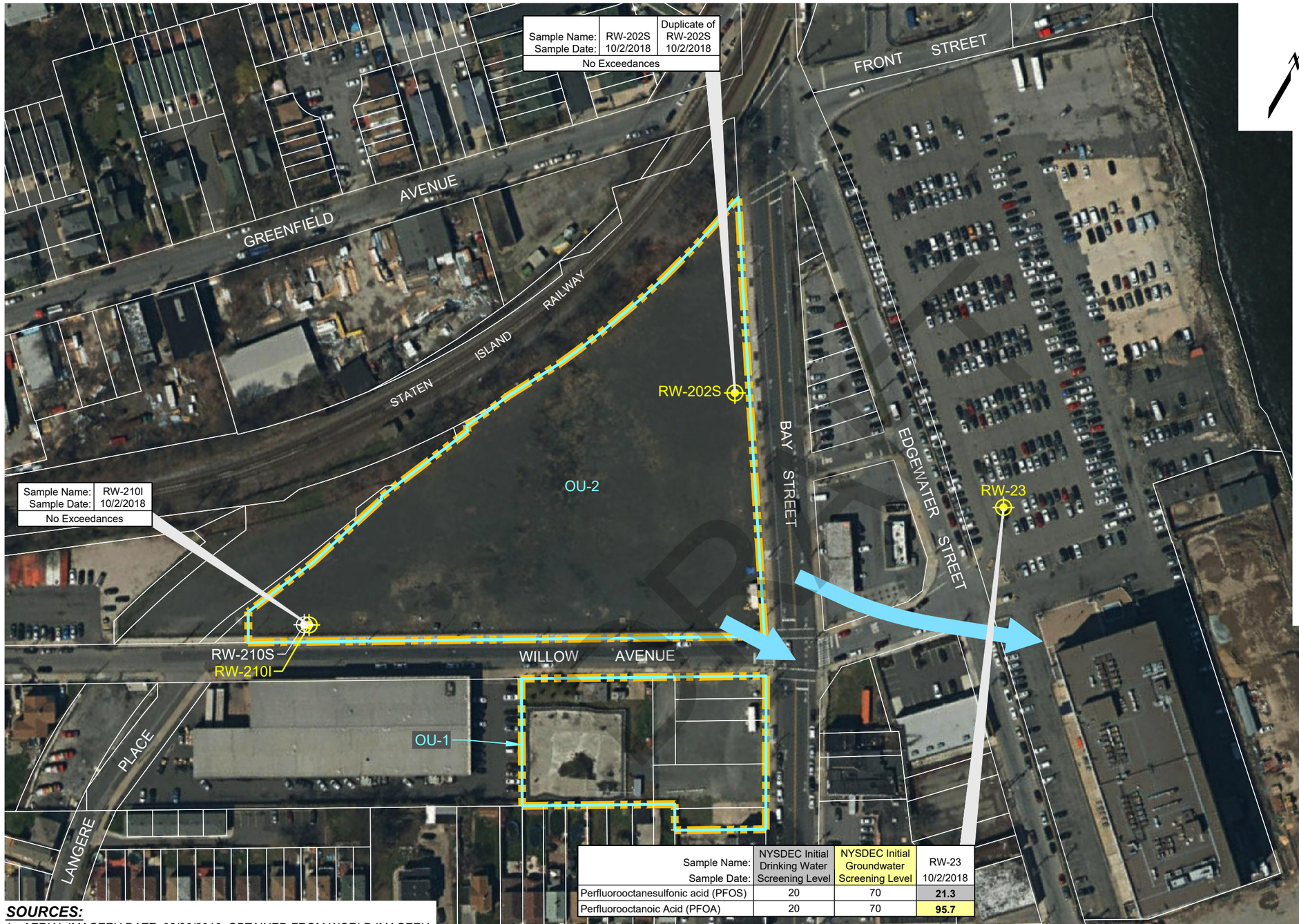
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Project 1802728

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ng/L) - BAY SHORE MGP SITE

February 2019 Fig. 2

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Sample Name:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	RW-23
Sample Date:			10/2/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**21.3**
Perfluorooctanoic Acid (PFOA)	20	70	**95.7**

LEGEND:

- MONITORING WELL
- NOT SAMPLED DUE TO OBSERVED NAPL
- SITE BOUNDARY
- HISTORIC SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCES:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *INTERIM STATUS REPORT, FIGURE 2: SITE LAYOUT,* PREPARED BY AECOM, DATE: 01/23/15.
3. *FOURTH SEMIANNUAL MONITORING (SA4) REPORT (JULY-DECEMBER 2-17) SITE MANAGEMENT PLAN MONITORING, FIGURE 6: GROUNDWATER CONTOURS DECEMBER 2017,* PREPARED BY AECOM, DATE: 4/23/18.

0 120 240

SCALE: 1" = 120'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

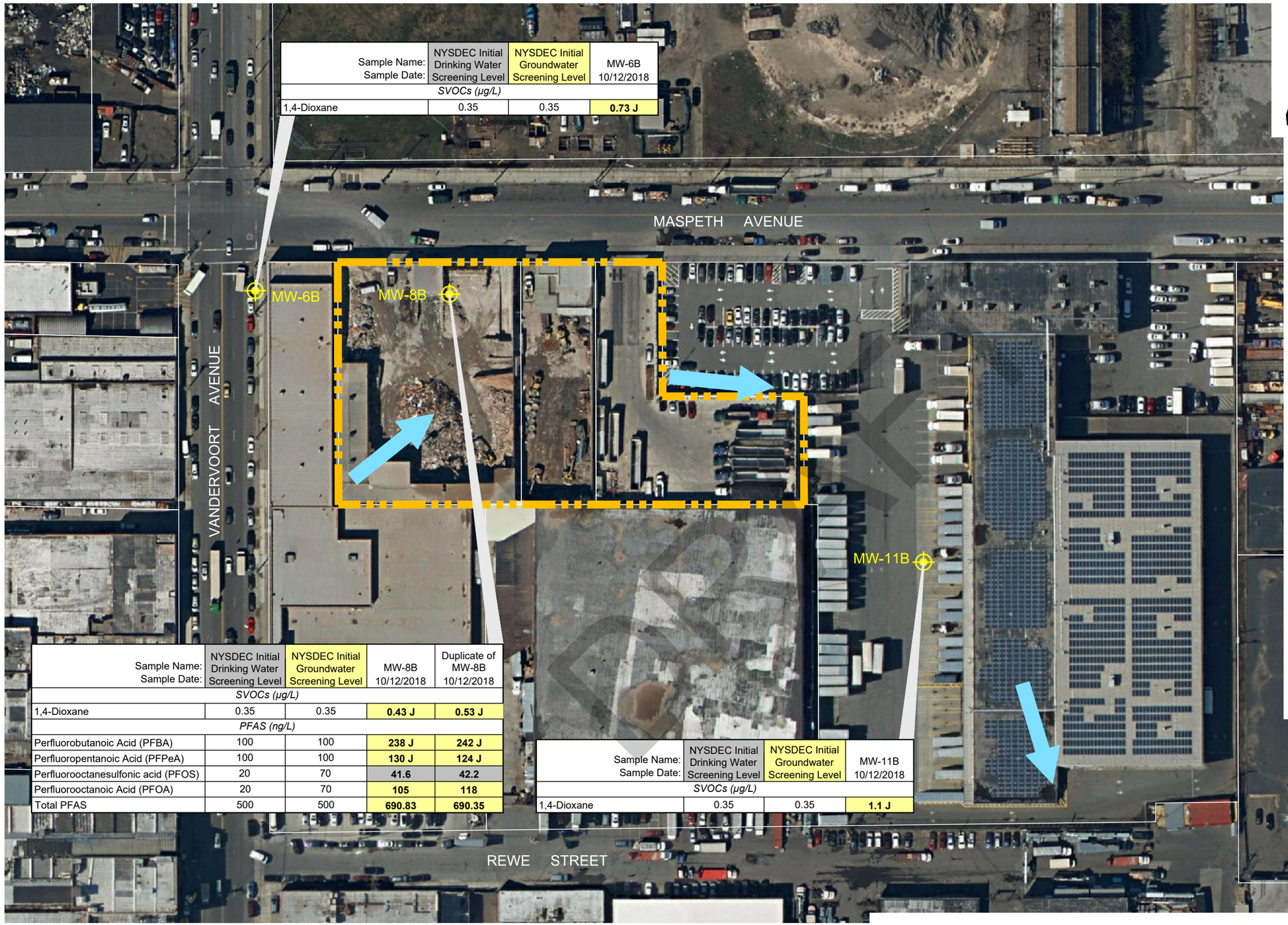
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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ng/L) - CLIFTON MGP SITE

Project 1802728 | February 2019 | Fig. 3

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-6B 10/12/2018
SVOCs (µg/L)			
1,4-Dioxane	0.35	0.35	**0.73 J**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-8B 10/12/2018	Duplicate of MW-8B 10/12/2018
SVOCs (µg/L)				
1,4-Dioxane	0.35	0.35	**0.43 J**	**0.53 J**
PFAS (ng/L)				
Perfluorobutanoic Acid (PFBA)	100	100	**238 J**	**242 J**
Perfluoropentanoic Acid (PFPeA)	100	100	**130 J**	**124 J**
Perfluorooctanesulfonic acid (PFOS)	20	70	**41.6**	**42.2**
Perfluorooctanoic Acid (PFOA)	20	70	**105**	**118**
Total PFAS	500	500	**690.83**	**690.35**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-11B 10/12/2018
SVOCs (µg/L)			
1,4-Dioxane	0.35	0.35	**1.1 J**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
µg/L	MICROGRAMS PER LITER OR PARTS PER BILLION (ppb)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
Total PFAS	ARE CALCULATED USING DETECTS ONLY
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *REMEDIAL INVESTIGATION REPORT* FIGURES, PREPARED BY AECOM, DATE: 3/20/2016 (GROUNDWATER FLOW DATE 12/4/15).

0 100 200

SCALE: 1" = 100'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

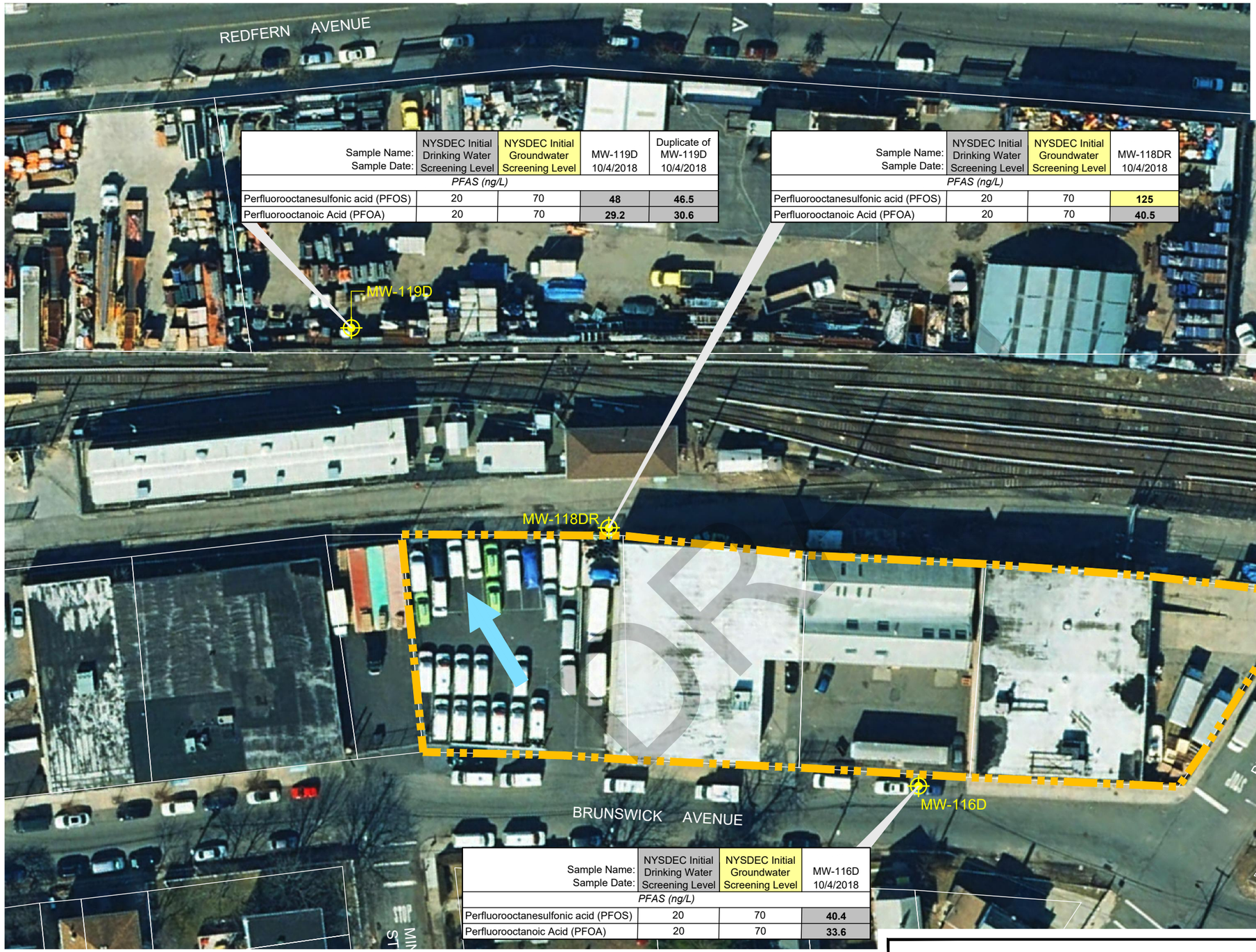
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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - EQUITY WORKS MGP SITE

Project 1802728 | February 2019 | Fig. 4

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-119D 10/4/2018	Duplicate of MW-119D 10/4/2018
PFAS (ng/L)				
Perfluorooctanesulfonic acid (PFOS)	20	70	**48**	**46.5**
Perfluorooctanoic Acid (PFOA)	20	70	**29.2**	**30.6**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-118DR 10/4/2018
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**125**
Perfluorooctanoic Acid (PFOA)	20	70	**40.5**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-116D 10/4/2018
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**40.4**
Perfluorooctanoic Acid (PFOA)	20	70	**33.6**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FINAL ENGINEERING REPORT, FIGURE 4-6: GROUNDWATER MONITORING NETWORK*, PREPARED BY AECOM, DATE: 1/24/15.

0 50 100

SCALE: 1" = 50'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

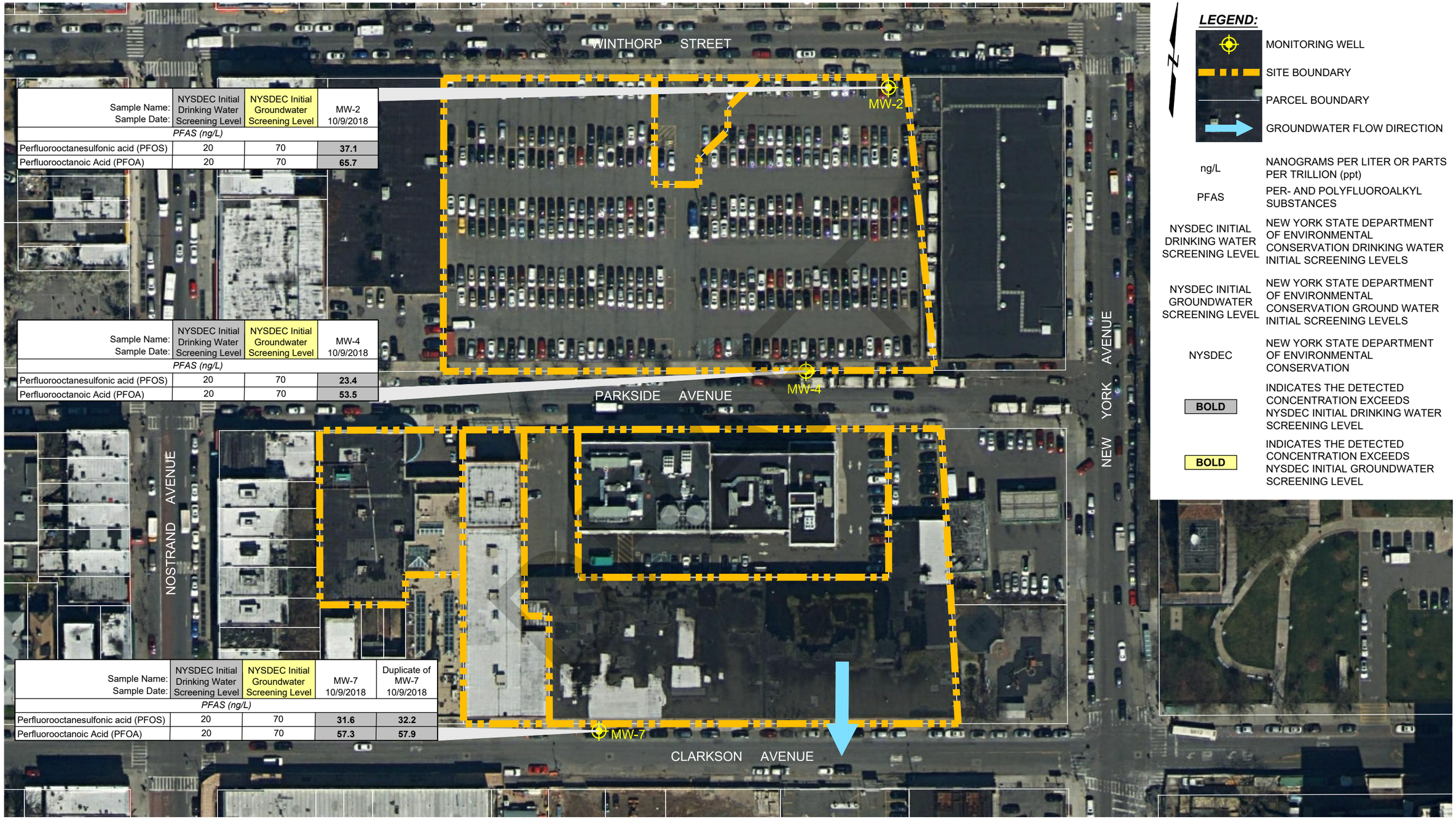
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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - FAR ROCKAWAY MGP SITE

Project 1802728 | February 2019 | Fig. 5

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-2 10/9/2018
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**37.1**
Perfluorooctanoic Acid (PFOA)	20	70	**65.7**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-4 10/9/2018
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**23.4**
Perfluorooctanoic Acid (PFOA)	20	70	**53.5**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-7 10/9/2018	Duplicate of MW-7 10/9/2018
PFAS (ng/L)				
Perfluorooctanesulfonic acid (PFOS)	20	70	**31.6**	**32.2**
Perfluorooctanoic Acid (PFOA)	20	70	**57.3**	**57.9**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *SITE MANAGEMENT PLAN, FIGURE 1-7: GROUNDWATER ELEVATION CONTOUR MAP,* PREPARED BY AECOM, DATE: 01/10/12 (GROUNDWATER CONTOURS DATED 7/28/2011).

0 80 160

SCALE: 1" = 80'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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GEI Consultants

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - FLATBUSH STATION A & B SITE

Project 1802728 | February 2019 | Fig. 6

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-18 10/5/2018	Duplicate of MW-18 10/5/2018
PFAS (ng/L)				
Perfluorooctanesulfonic acid (PFOS)	20	70	**87.3**	**88**
Perfluorooctanoic Acid (PFOA)	20	70	**107**	**97.4**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-2 10/5/2018
SVOCs (µg/L)			
1,4-Dioxane	0.35	0.35	**0.63**
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**45.6**
Perfluorooctanoic Acid (PFOA)	20	70	**137**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-16 10/5/2018
PFAS (ng/L)			
Perfluorobutanoic Acid (PFBA)	100	100	**276**
Perfluorohexanoic Acid (PFHxA)	100	100	**181**
Perfluorooctanesulfonic acid (PFOS)	20	70	**898**
Perfluorooctanoic Acid (PFOA)	20	70	**487**
Total PFAS	500	500	**2083.29**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
µg/L	MICROGRAMS PER LITER OR PARTS PER BILLION (ppb)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
Total PFAS	ARE CALCULATED USING DETECTS ONLY
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCE:

1. AERIAL IMAGERY DATE: 05/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. FIGURES 2 & 4 FROM *PERIODIC REVIEW REPORT*, PREPARED BY ARCADIS, DATE: JANUARY 31 2014 (GROUNDWATER CONTOURS FROM 9/21/16).

0 150 30

SCALE: 1" = 150'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - FORMER BROOKLYN BOROUGH GAS WORKS (CONEY ISLAND) MGP SITE

Project 1802728 | February 2019 | Fig. 7

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	FW-MW-19 10/11/2018	Duplicate of FW-MW-19 10/11/2018
PFAS (ng/L)				
Perfluoroheptanoic acid (PFHpA)	100	100	**292**	**261**
Perfluorohexanoic acid (PFHxA)	100	100	**106**	**100**
Perfluorooctanoic Acid (PFOA)	20	70	**115**	**103**
Total PFAS	500	500	**670.89**	**617.49**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	FW-MW-17 10/11/2018
PFAS (ng/L)			
Perfluorooctanoic Acid (PFOA)	20	70	**221**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	FW-MW-5R 10/11/2018
PFAS (ng/L)			
Perfluorooctanoic Acid (PFOA)	20	70	**36.9**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	FW-MW-4 10/11/2018
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**34.8**
Perfluorooctanoic Acid (PFOA)	20	70	**135**

LEGEND:

- MONITORING WELL
- NOT SAMPLED DUE TO EQUIPMENT IN WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *REMEDIAL INVESTIGATION REPORT, FIGURE 14: SHALLOW GROUNDWATER CONTOURS AT HIGH TIDE AND DISSOLVED-PHASE GROUNDWATER ANALYTICAL SUMMARY - MAY 19, 2011,* PREPARED BY GEI, DATE: JULY 2012.

0 120 240

SCALE: 1" = 120'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

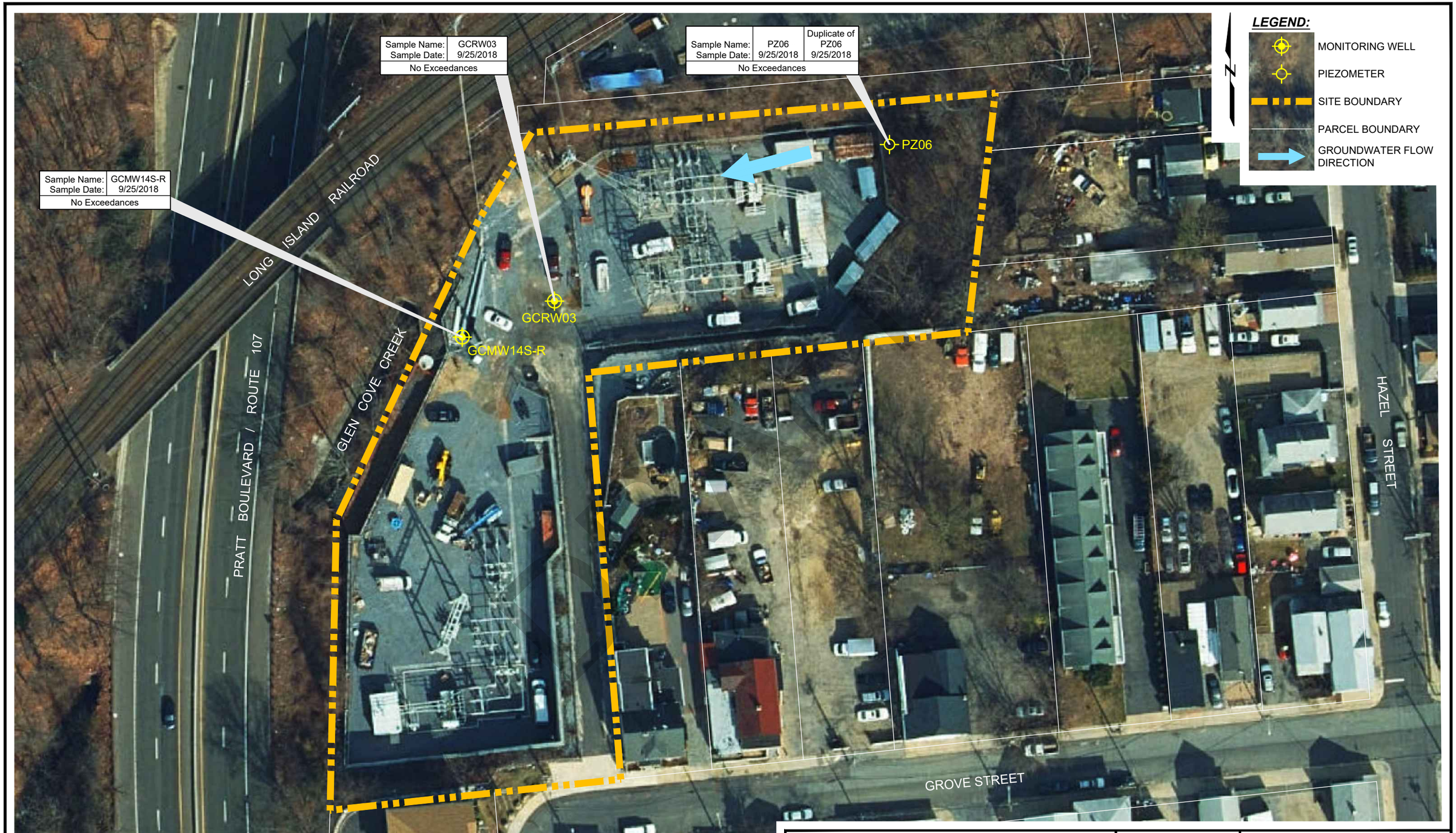
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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - FULTON WORKS MGP SITE

Project 1802728 | February 2019 | Fig. 8

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SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. FIGURES FROM *GROUNDWATER MONITORING REPORT - JUNE 2018 (Q2),* PREPARED BY GEI CONSULTANTS, INC., DATE: AUGUST 2018.

0 150 30

SCALE: 1" = 150'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

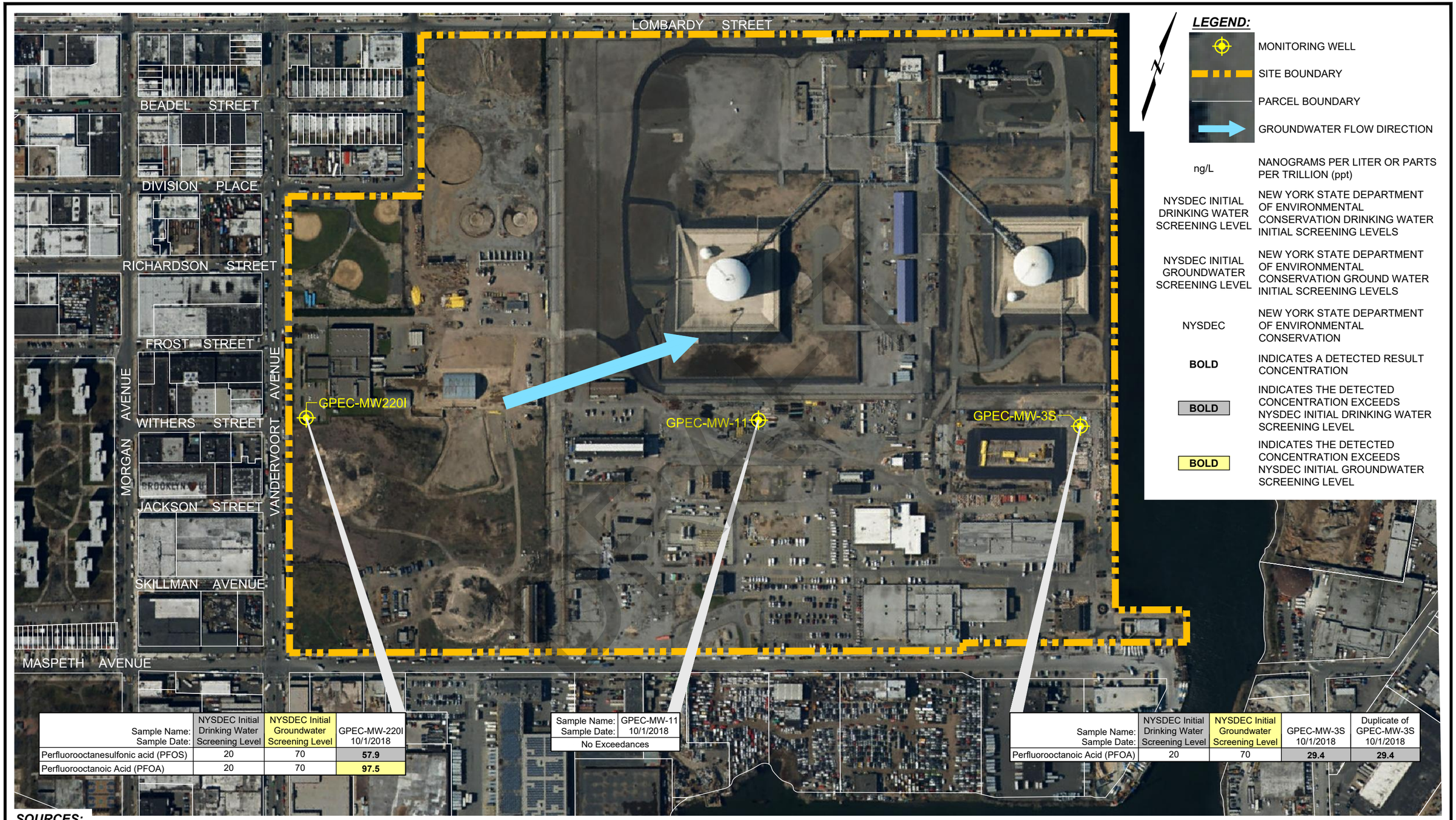
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GEI Consultants

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - GLEN COVE MGP SITE

Project 1802728 | February 2019 | Fig. 9

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LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	GPEC-MW-220I 10/1/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**57.9**
Perfluorooctanoic Acid (PFOA)	20	70	**97.5**

Sample Name:	GPEC-MW-11
Sample Date:	10/1/2018
No Exceedances	

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	GPEC-MW-3S 10/1/2018	Duplicate of GPEC-MW-3S 10/1/2018
Perfluorooctanoic Acid (PFOA)	20	70	**29.4**	**29.4**

SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. FIGURES FROM *INTERIM REMEDIAL INVESTIGATION REPORT,* PREPARED BY GEI CONSULTANTS, INC., DATE: NOVEMBER 2016.
3. *FIGURE 4-4: QUALITATIVE CALIBRATION - UPPER GLACIAL AQUIFER,* PREPARED BY GEI CONSULTANTS, INC., DATE: 11/2017.

0 300 600

SCALE: 1" = 300'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ng/L) - GREENPOINT MGP ENERGY CENTER SITE

Project 1802728 | February 2019 | Fig. 10

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Sample Name:	MW-16S	Duplicate of MW-16S
Sample Date:	10/23/2018	10/23/2018
No Exceedances		

Sample Name:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	GW-8
Sample Date:			10/23/2018
SVOCs (µg/L)			
1,4-Dioxane	0.35	0.35	**0.49 J**
PFAS (ng/L)			
Perfluorooctanoic Acid (PFOA)	20	70	**48.3**

Sample Name:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-52I
Sample Date:			10/23/2018
PFAS (ng/L)			
Perfluorooctanesulfonic acid (PFOS)	20	70	**74.2**
Perfluorooctanoic Acid (PFOA)	20	70	**38.1**

LEGEND:

- MONITORING WELL
- NOT SAMPLED DUE TO NAPL IN WELL
- NOT SAMPLED, WELL COULD NOT BE LOCATED
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
µg/L	MICROGRAMS PER LITER OR PARTS PER BILLION (ppb)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIGURE 4-3: SHALLOW GROUNDWATER ELEVATION CONTOUR MAP,* PREPARED BY AECOM, DATE: 9/30/13 (GROUNDWATER CONTOURS DATED 10/18/12).
3. *SITE CHARACTERIZATION WORK PLAN, FIGURE 2: PROPOSED SAMPLE LOCATIONS,* PREPARED BY GEI CONSULTANTS, INC., DATE: JULY 2007.

0 150 30

SCALE: 1" = 150'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - INWOOD HOLDER SITE

Project 1802728 | February 2019 | Fig. 11

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	KC-MW-01 10/5/2018
SVOCs (µg/L)			
1,4-Dioxane	0.35	0.35	**0.57 J**
PFAS (ng/L)			
Perfluorooctanoic Acid (PFOA)	20	70	**86.7**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	KC-MW-09 10/5/2018
PFAS (ng/L)			
Perfluorooctanoic Acid (PFOA)	20	70	**44.7**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	KC-MW-05 10/5/2018	Duplicate of KC-MW-05 10/5/2018
PFAS (ng/L)				
Perfluorobutanoic Acid (PFBA)	100	100	**2940 J**	**3210 J**
Perfluoropentanoic Acid (PFPeA)	100	100	**243**	**221**
Perfluorooctanoic Acid (PFOA)	20	70	**155 J**	**154 J**
Total PFAS	500	500	**3520.8**	**3783.2**

LEGEND:

- MONITORING WELL
- NOT SAMPLED DUE TO NAPL IN WELL
- SITE BOUNDARY
- HISTORIC SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
µg/L	MICROGRAMS PER LITER OR PARTS PER BILLION (ppb)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
Total PFAS	ARE CALCULATED USING DETECTS ONLY
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

SOURCE:

1. AERIAL IMAGERY DATE: 03/96/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. FIGURES FROM *SITE CHARACTERIZATION REPORT,* PREPARED BY GEI CONSULTANTS, INC., DATE: JUNE 2016.
3. *FIG. 1: MONITORING WELL LOCATIONS,* PREPARED BY GEI CONSULTANTS, INC., DATE: MAY 2018.

0 150 30

SCALE: 1" = 150'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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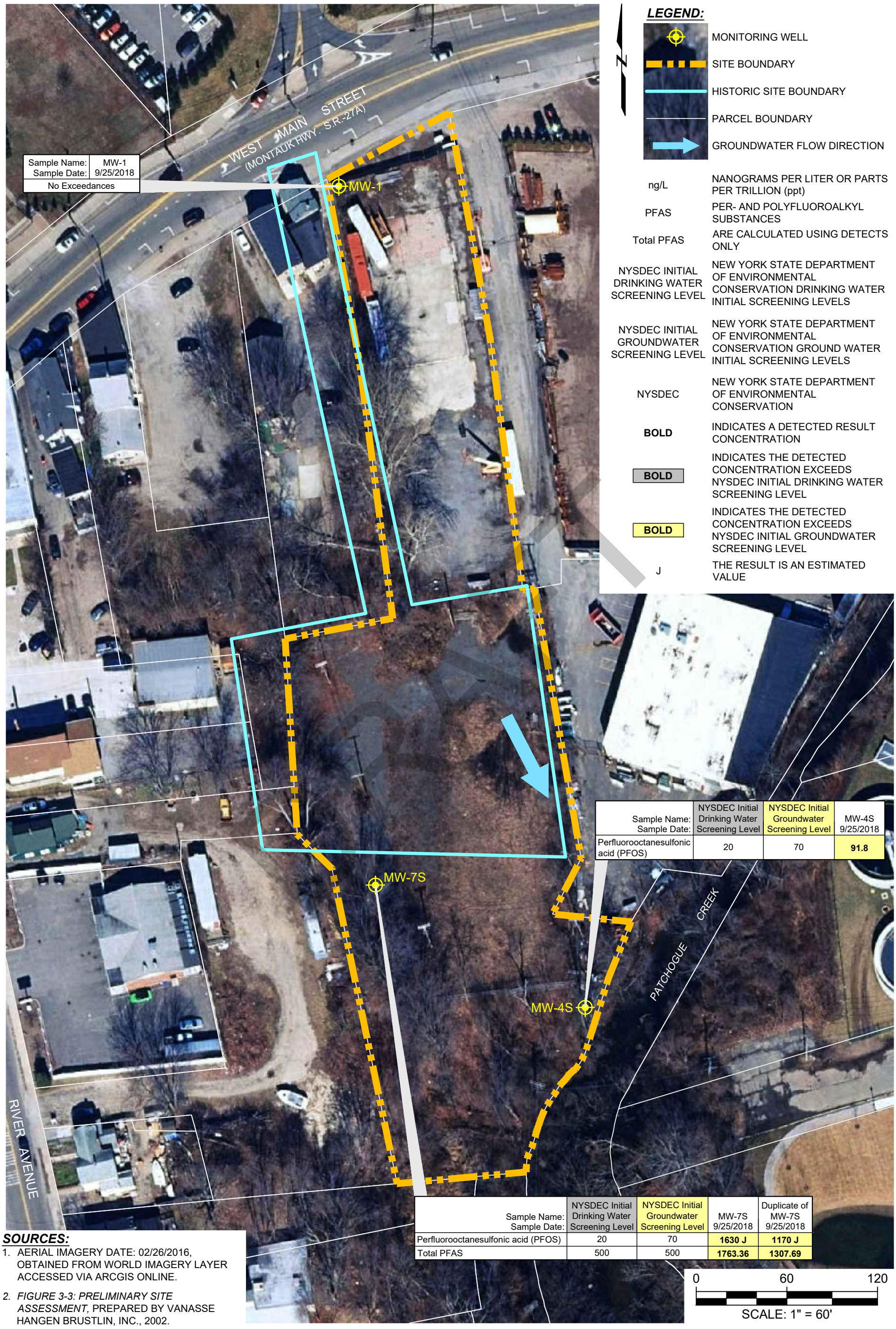
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Project 1802728

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - KINGS COUNTY WORKS MGP SITE

February 2019 Fig. 12

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LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- HISTORIC SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
Total PFAS	ARE CALCULATED USING DETECTS ONLY
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-4S 9/25/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**91.8**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-7S 9/25/2018	Duplicate of MW-7S 9/25/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**1630 J**	**1170 J**
Total PFAS	500	500	**1763.36**	**1307.69**

0 60 120

SCALE: 1" = 60'

SOURCES:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIGURE 3-3: PRELIMINARY SITE ASSESSMENT,* PREPARED BY VANASSE HANGEN BRUSTLIN, INC., 2002.
3. *FIGURE 2-4: MONITORING WELL LOCATIONS,* PREPARED BY TETRA TECH EC, INC.
4. *FIGURE 1: WATER TABLE ELEVATION CONTOUR MAP - DECEMBER 27, 2016,* PREPARED BY BROWN AND CALDWELL, DATE: 3/13/17.

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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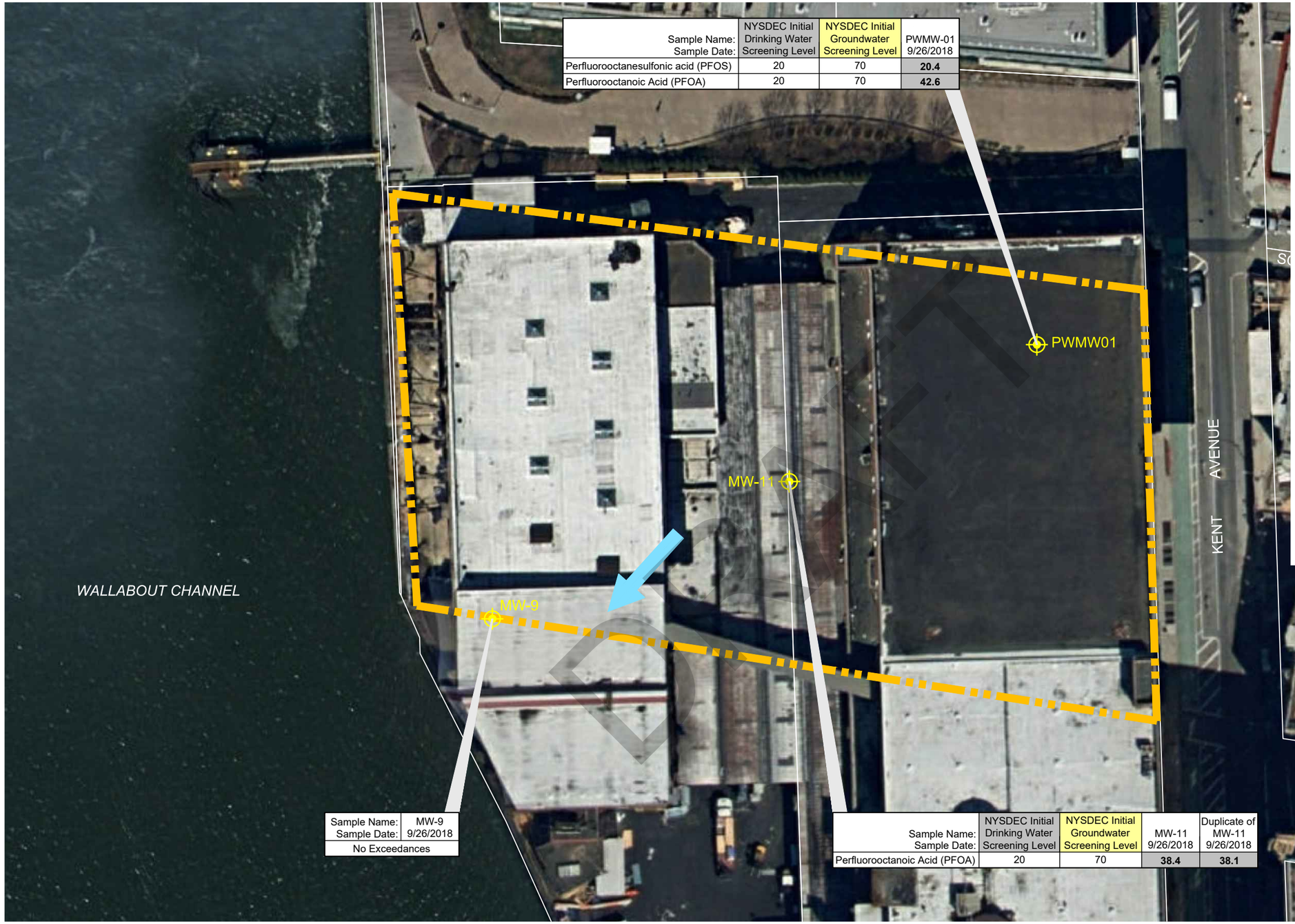
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Project 1802728

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ng/L) - PATCHOGUE MGP SITE

February 2019 Fig. 13

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	PWMW-01 9/26/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**20.4**
Perfluorooctanoic Acid (PFOA)	20	70	**42.6**

Sample Name:	MW-9
Sample Date:	9/26/2018
No Exceedances	

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-11 9/26/2018	Duplicate of MW-11 9/26/2018
Perfluorooctanoic Acid (PFOA)	20	70	**38.4**	**38.1**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL

SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIGURE 12: MONITORING WELL LOCATIONS, GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS,* PREPARED BY TETRA TECH INC., DATE: 8/3/17.

0 50 100

SCALE: 1" = 50'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ng/L) - PEOPLES WORKS MGP SITE

Project 1802728 | February 2019 | Fig. 14

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	RW-05A 9/28/2018	Duplicate of RW-05A 9/28/2018
Perfluorobutanoic acid (PFBA)	100	100	**148 J**	**115 J**

Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	MW-02S 9/28/2018
Perfluorooctanesulfonic acid (PFOS)	20	70	**122 J**
Perfluorooctanoic Acid (PFOA)	20	70	**51.9**



Sample Name:	MW-26S
Sample Date:	9/28/2018
No Exceedances	

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

SOURCE:

1. AERIAL IMAGERY DATE: 05/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *GROUNDWATER MONITORING REPORT* FIGURES, PREPARED BY GEI CONSULTANTS, INC., DATE: APRIL 2018 (GROUNDWATER CONTOURS DATED 12/2017).

0 100 200

SCALE: 1" = 100'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (ng/L) - ROCKAWAY PARK MGP SITE

Project 1802728 | February 2019 | Fig. 15

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Sample Name:	SHMW-03I
Sample Date:	9/27/2018
No Exceedances	

Sample Name:	SHMW-01I
Sample Date:	9/27/2018
No Exceedances	

Sample Name:	SHMW-13I	Duplicate of SHMW-13I
Sample Date:	9/27/2018	9/27/2018
No Exceedances		

SAG HARBOR COVE

SHMW-03I

SHMW-01IR

SHMW-13I

NASSAU STREET

MAIN STREET

BRIDGE STREET

MEADOW STREET

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

DRAFT

SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIG. 2: MONITORING WELL LOCATION MAP,* PREPARED BY GEI CONSULTANTS, INC., DATE: AUGUST 2017.
3. *FIGURE 1-4: GROUNDWATER FLOW MAP, WATER TABLE CONTOUR MAP - LOW TIDE - MAY 20, 2002,* PREPARED BY AECOM, DATE: 2/18/11.

0 80 160

SCALE: 1" = 80'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - SAG HARBOR MGP SITE

Project 1802728 | February 2019 | Fig. 16

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Sample Name: / Sample Date: / Sample Location:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	SSMW-03 10/3/2018 Upgradient	Duplicate of SSMW-03 10/3/2018 Downgradient
PFAS (ng/L)				
Perfluorooctanesulfonic acid (PFOS)	20	70	**42.4**	**40.8**
Perfluorooctanoic Acid (PFOA)	500	500	**106**	**92.1**

Sample Name: / Sample Date: / Sample Location:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	SSMW-05 10/3/2018 Downgradient
SVOCs (µg/L)			
1,4-Dioxane	0.35	0.35	**0.42 J**
PFAS (ng/L)			
Perfluorohexanoic acid (PFHxA)	100	100	**208**
Perfluoropentanoic Acid (PFPeA)	100	100	**164**
Perfluorooctanesulfonic acid (PFOS)	20	70	**44.7 J**
Perfluorooctanoic Acid (PFOA)	20	70	**180**
Total PFAS	500	500	**816.78**

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
µg/L	MICROGRAMS PER LITER OR PARTS PER BILLION (ppb)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
Total PFAS	ARE CALCULATED USING DETECTS ONLY
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *ANNUAL GROUNDWATER SAMPLING REPORT, FIG. 4: GROUNDWATER CONTOURS (AUGUST 24, 2017) AND GROUNDWATER ANALYTICAL SUMMARY (ug/L),* PREPARED BY GEI CONSULTANTS, INC., DATE: DECEMBER 2017.

0 50 100

SCALE: 1" = 50'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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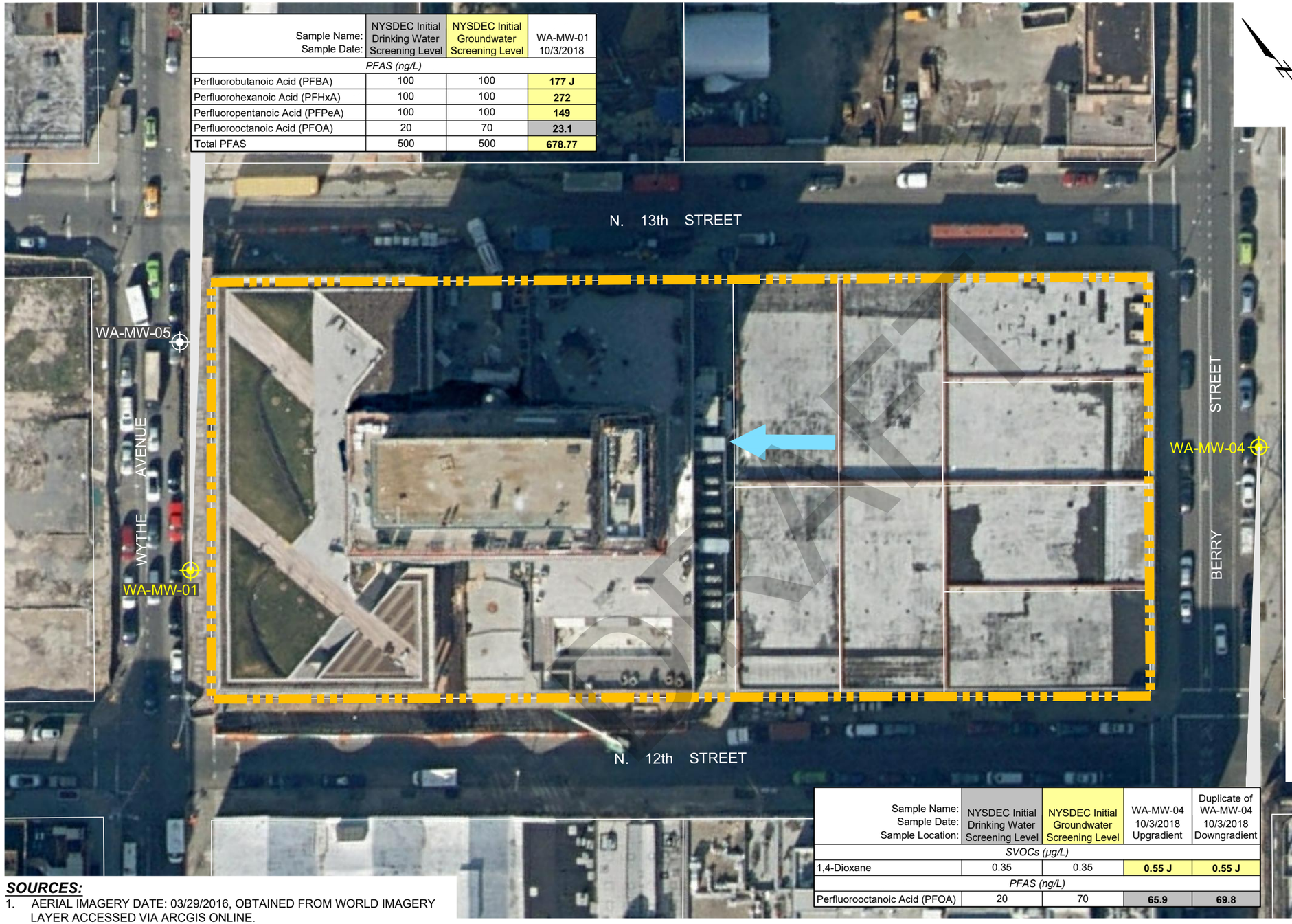
GEI Consultants

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - SKILLMAN ST. STATION SITE

Project 1802728 | February 2019 | Fig. 17

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Sample Name: / Sample Date:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	WA-MW-01 10/3/2018
PFAS (ng/L)			
Perfluorobutanoic Acid (PFBA)	100	100	**177 J**
Perfluorohexanoic Acid (PFHxA)	100	100	**272**
Perfluoropentanoic Acid (PFPeA)	100	100	**149**
Perfluorooctanoic Acid (PFOA)	20	70	**23.1**
Total PFAS	500	500	**678.77**

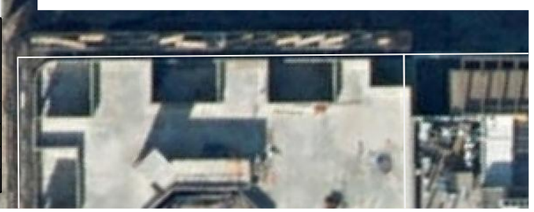


LEGEND:

- MONITORING WELL
- NOT SAMPLED DUE TO THE GROUNDWATER FLOW DIRECTION OBSERVED DURING RECENT SAMPLING
- SITE BOUNDARY
- PARCEL BOUNDARY
- GROUNDWATER FLOW DIRECTION

ng/L	NANOGRAMS PER LITER OR PARTS PER TRILLION (ppt)
µg/L	MICROGRAMS PER LITER OR PARTS PER BILLION (ppb)
PFAS	PER- AND POLYFLUOROALKYL SUBSTANCES
SVOC	SEMI-VOLATILE ORGANIC COMPOUND
Total PFAS	ARE CALCULATED USING DETECTS ONLY
NYSDEC INITIAL DRINKING WATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DRINKING WATER INITIAL SCREENING LEVELS
NYSDEC INITIAL GROUNDWATER SCREENING LEVEL	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GROUND WATER INITIAL SCREENING LEVELS
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BOLD	INDICATES A DETECTED RESULT CONCENTRATION
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL DRINKING WATER SCREENING LEVEL
BOLD	INDICATES THE DETECTED CONCENTRATION EXCEEDS NYSDEC INITIAL GROUNDWATER SCREENING LEVEL
J	THE RESULT IS AN ESTIMATED VALUE

Sample Name: / Sample Date: / Sample Location:	NYSDEC Initial Drinking Water Screening Level	NYSDEC Initial Groundwater Screening Level	WA-MW-04 10/3/2018 Upgradient	Duplicate of WA-MW-04 10/3/2018 Downgradient
SVOCs (µg/L)				
1,4-Dioxane	0.35	0.35	**0.55 J**	**0.55 J**
PFAS (ng/L)				
Perfluorooctanoic Acid (PFOA)	20	70	**65.9**	**69.8**



SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *INTERIM SITE MANAGEMENT PLAN, FIG. 4: HISTORICAL SITE CONDITIONS, SAMPLE LOCATION AND CROSS SECTION LOCATION MAP,* PREPARED BY GEI CONSULTANTS, INC., DATE: SEPTEMBER 2017.
3. *ANNUAL GROUNDWATER SAMPLING REPORT, FIG. 4: JULY 2018 GROUNDWATER CONTOURS (ft) AND ANALYTICAL RESULTS SUMMARY (µg/L),* PREPARED BY GEI CONSULTANTS, INC., DATE: OCTOBER 2018.

0 60 120

SCALE: 1" = 60'

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - WYTHE AVE. STATION SITE

Project 1802728 | February 2019 | Fig. 18

DRAFT

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SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIG. 1-12 PUBLIC AND PRIVATE WELLS WITHIN A ONE-HALF MILE RADIUS OF SITE,* PREPARED BY DVIRKA AND BARTILUCCI, DATE: 03/28/02.

0 800 1600

SCALE: 1" = 800'

Emerging Contaminant Sampling Report
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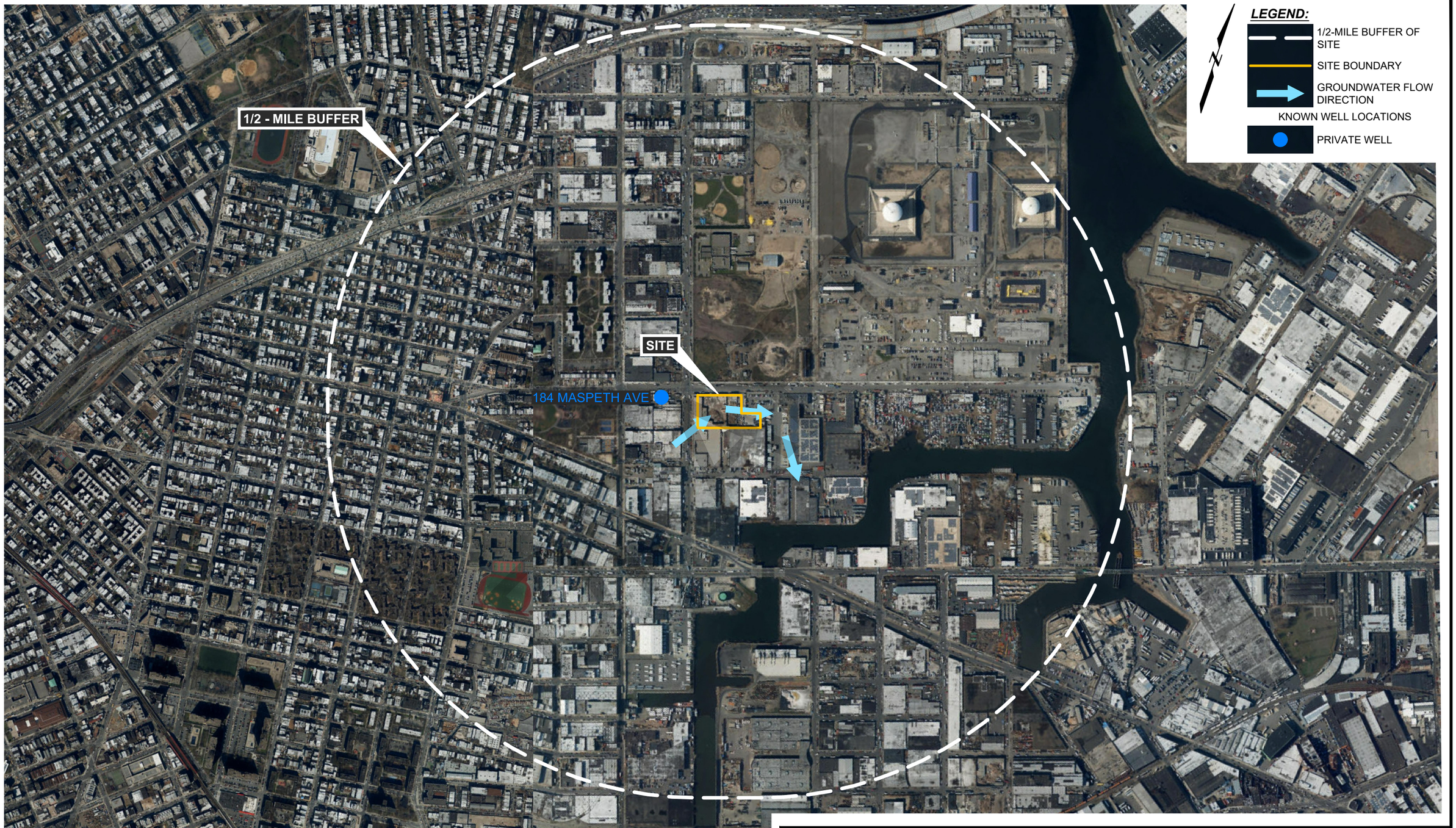
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Project 1802728

WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE BAY SHORE MGP SITE

February 2019 Fig. 19

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SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *REMEDIAL INVESTIGATION REPORT* FIGURES, PREPARED BY AECOM, DATE: 3/20/2016 (GROUNDWATER FLOW DATE 12/4/15).

0 1/8 1/4

SCALE: 1" = 1/8 MILE

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Project 1802728

WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE EQUITY WORKS MGP SITE

February 2019 Fig. 20

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SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. MAP OF WELLS IDENTIFIED DURING A 2012 FOIA REQUEST IN THE VICINITY OF THE FAR ROCKAWAY SITE PROVIDED BY PETER S. COX, PG OF AECOM IN AND EMAIL TO GEI ON 10/31/2018.
3. *PHYSICAL SETTING SOURCE MAP,* INWOOD HOLDER, INQUIRY NUMBER: 01187089.55r, PREPARED BY ENVIRONMENTAL DATA RESOURCES, INC., DATE: MAY 10, 2004.
4. *PHYSICAL SETTING SOURCE MAP,* FAR ROCKAWAY MGP, INQUIRY NUMBER: 01187089.49r, PREPARED BY ENVIRONMENTAL DATA RESOURCES, INC., DATE: MAY 07, 2004.

0 1/8 1/4

SCALE: 1" = 1/8 MILE

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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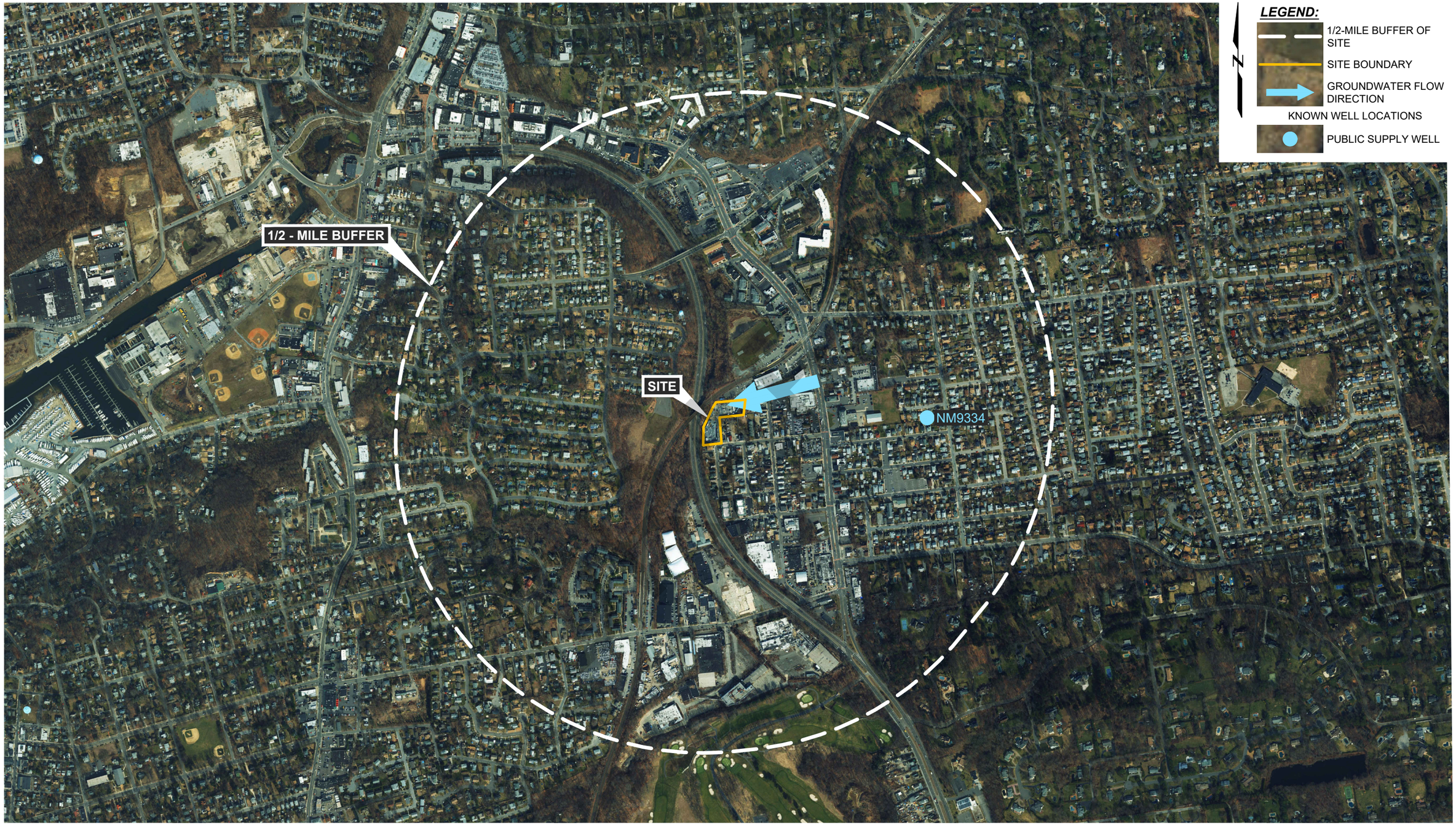
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Project 1802728

WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE FAR ROCKAWAY MGP SITE

February 2019 Fig. 21

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SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. FIGURE NO. 1-3: *APPROXIMATE LOCATION OF PUBLIC SUPPLY WELLS*, GLEN COVE FORMER MGP SITE, GLEN COVE, NASSAU COUNTY, NEW YORK, PREPARED BY PS&S, DATE: 09/26/08.

0 800 1600

SCALE: 1" = 800'

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National Grid New York Former MGP Sites

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WATER SUPPLY WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE GLEN COVE MGP SITE

Project 1802728 | February 2019 | Fig. 22

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SOURCES:

1. AERIAL IMAGERY DATE: 03/29/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. FIGURES FROM *INTERIM REMEDIAL INVESTIGATION REPORT,* PREPARED BY GEI CONSULTANTS, INC., DATE: NOVEMBER 2016.

0 1000 2000

SCALE: 1" = 1000'

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National Grid New York Former MGP Sites

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WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE GREENPOINT MGP SITE

February 2019 Fig. 23

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SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *PHYSICAL SETTING SOURCE MAP,* INWOOD HOLDER, INQUIRY NUMBER: 01187089.55r, PREPARED BY ENVIRONMENTAL DATA RESOURCES, INC., DATE: MAY 10, 2004.
3. MAP OF WELLS IDENTIFIED DURING A 2012 FOIA REQUEST IN THE VICINITY OF THE FAR ROCKAWAY SITE PROVIDED BY PETER S. COX, PG OF AECOM IN AND EMAIL TO GEI ON 10/31/2018.
4. *PHYSICAL SETTING SOURCE MAP,* FAR ROCKAWAY MGP, INQUIRY NUMBER: 01187089.49r, PREPARED BY ENVIRONMENTAL DATA RESOURCES, INC., DATE: MAY 07, 2004.

0 800 1600

SCALE: 1" = 800'

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WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE INWOOD HOLDER SITE

February 2019 Fig. 24

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SOURCES:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIGURE 3-3: PRELIMINARY SITE ASSESSMENT,* PREPARED BY VANASSE HANGEN BRUSTLIN, INC., 2002.
3. *FIGURE 3-4: LOCATION OF WELLS IDENTIFIED WITHIN ONE MILE OF THE SITE,* PREPARED BY TETRA TECH EC, INC.

0 1/8 1/4

SCALE: 1" = 1/8 MILE

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National Grid New York Former MGP Sites

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WATER SUPPLY WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE PATCHOGUE MGP SITE

Project 1802728 | February 2019 | Fig. 25

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SOURCE:

1. AERIAL IMAGERY DATE: 02/26/2016, OBTAINED FROM WORLD IMAGERY LAYER ACCESSED VIA ARCGIS ONLINE.
2. *FIG. 1-9: PUBLIC AND PRIVATE WELLS WITHIN A ONE-HALF MILE RADIUS OF SITE*, SAG HARBOR FORMER MGP SITE REMEDIAL INVESTIGATION, PREPARED BY DVIRKA AND BARTILUCCI.

0 1/8 1/4

SCALE: 1" = 1/8 MILE

Emerging Contaminant Sampling Report
National Grid New York Former MGP Sites

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WATER SUPPLY WELLS IDENTIFIED WITHIN 1/2 - MILE OF THE SAG HARBOR MGP SITE

Project 1802728 | February 2019 | Fig. 26

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Appendix A

Groundwater Sampling Field Sheets

DRAFT

Monitoring Well Sample Data Form

Project: Bay Ridge - PFAS Sampling **Well ID:** MW-112 **Sample Date:** 10-10-18

Total Well Depth (from top of casing): 80.40'

Depth to Water (from top of casing): 71.25'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1150 Finish: 1220

Purging Method: Peristaltic Pump

Sample Time: Start: 1225 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1155	0.4	Initial	7.39	1.15	0.0	0.70	20.90	0.6	-105	Well Headspace PID =
1200		2	7.41	1.11	0.0	0.06	20.53	0.5	-125	
1205		4	7.45	0.864	0.0	0.28	20.47	0.4	-98	
1210		6	7.42	0.852	0.0	0.22	20.63	0.4	-105	
1215		8	7.43	0.841	0.0	0.29	20.53	0.4	-102	
1220		10	7.41	0.830	0.0	0.43	20.53	0.4	-97	

MS/MSD DUP-101018

Monitoring Well Sample Data Form

Project: Bay Ridge - PFAS Sampling **Well ID:** MW-105 **Sample Date:** 10-10-18

Total Well Depth (from top of casing): 84.5' **Depth to Water (from top of casing):** 76.15'

Well Diameter: 3/4" 1" (2") 4" **Pump Intake Depth (Mid-Point of Screen Zone):**

Sampling Crew: Craig Hayes **Purge Time:** Start: 0915 Finish: 0955

Purging Method: Peristaltic Pump

Sampling Method: Low Flow **Sample Time:** Start: 1000 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
920	0.4	Initial	7.22	540	0.0	1.94	22.29	2.9	287	Well Headspace PID =
925		2	7.16	5.16	0.0	0.96	22.06	2.8	258	
930		4	7.17	4.87	0.0	0.77	21.68	2.6	242	
935		6	7.17	4.76	0.0	0.63	21.55	2.5	239	
940		8	7.18	4.67	0.0	0.53	21.49	2.5	277	
945		10	7.19	4.65	0.0	0.48	21.10	2.5	236	
950		12	7.19	4.53	0.0	0.45	21.14	2.5	235	
955		14	7.19	4.48	0.0	0.46	21.14	2.5	235	

FB-101018 @0905

Bayshore PFAS Sampling

MS/MSD collected.

Monitoring Well Sample Data Form

Project: National Grid - Bay ~~Shore OU~~ PFAS Sampling

Well ID: BBMW-41I

Sample Date: 9/24/18

Total Well Depth (from top of casing): 35.5'

Depth to Water (from top of casing): 10.35'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1118 Finish: 1200

Purging Method: Peristaltic Pump

Sample Time: Start: 1200 Finish: 1213

Sampling Method: Low Flow

Sample Analysis: ~~BTEX/PAH+2-Methylnaphthalene~~ PFAS/1,4 Dioxane

3 well volumes = 9.63 gal.

			✓	✓	✓ Purge Data ✓		✓	✓	✓	
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	Temperature (Cel.)	pH (std. Units)	ORP (mV)	Conductivity (mS/cm)	Turbitity (NTU)	Disolved Oxygen (mg/L)	Salinity (%) ppt	Comments/Observations
1120	0.4	Initial	16.95	5.79	314	0.36	2.0	2.14	0.2	Well Headspace PID = N/A
1125		1.25	15.40	5.81	304	~~0.36~~ 0.32	1.1	0.75	0.2	
1130		2.5	15.33	5.78	291	0.33	1.1	0.23	0.2	
1135		3.75	15.31	5.77	283	0.33	0.7	0.00	0.2	
1140	~~0.4~~	5	15.24	5.77	280	0.33	1.4	0.00	0.2	
1145		6.25	15.16	5.77	275	0.33	1.5	0.00	0.2	
1150		7.5	15.13	5.76	274	0.33	1.6	0.00	0.2	
1155		8.75	15.12	5.75	275	0.33	1.6	0.00	0.2	
1200		10	15.11	5.74	274	0.33	1.7	0.00	0.2	MS/MSD collected.

* Removed Tubing

DRAFT

Bay Shore PFAS Sampling

duplicate collected @ 1400 MW-XX-092418

Monitoring Well Sample Data Form

Project: National Grid - ~~Bay Shore OU~~ PFAS sampling

Well ID: MW-29S

Sample Date: 9/24/2018

Total Well Depth (from top of casing): ~~10~~ 10.25'

Depth to Water (from top of casing): 3.30'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1343 Finish: ~~1~~ 1420

Purging Method: Peristaltic Pump

Sample Time: Start: 1420 Finish:

Sampling Method: Low Flow

Sample Analysis: ~~BTEX/PAH/2-Methylnaphthalene~~ PFAS/1,4 Dioxane

3 well volumes = 3.39 gallons

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	Temperature (Cel.)	pH (std. Units)	ORP (mV)	Conductivity (mS/cm)	Turbitity (NTU)	Disolved Oxygen (mg/L)	Salinity (%)	Comments/Observations
1345	0.4	~~Initial~~	20.67	6.08	129	0.47	26.1	0.09	—	Well Headspace PID =
1350		.5 ~~2~~	20.70	6.19	102	0.40	8.6	0.00	—	
1355		1 ~~4~~	20.77	6.18	98	0.32	4.2	0.00	—	
1400		1.5 ~~6~~	20.92	6.16	96	0.27	2.3	0.00	—	
1405	~~0.4~~	2 ~~8~~	21.02	6.18	95	0.25	~~2.7~~	0.00	—	
1410		2.5 ~~10~~	21.18	6.22	92	0.24	~~0.0~~ 1.5	0.00	—	
1415		3	21.55	6.27	88	0.23	1.3	0.00	—	
1420		3.5	21.65	6.29	86	0.22	1.1	0.00	—	Dup collected too. @ 1400 sample at 1425

*Removed Tubing

DRAFT

Monitoring Well Sample Data Form

Project: National Grid - ~~Bay Shore OU~~ PFAS Sampling

Well ID: OU2-MW-57I

Sample Date: 9/24/18

Total Well Depth (from top of casing): 32.14'

Depth to Water (from top of casing): 6.28

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1530 Finish: 1600

Sample Time: Start: 1605 Finish:

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Analysis: ~~BTEX/PAH-2-Methylnaphthalene~~ PFAS/1,4 Dioxane

3 well volumes = 12.066 gallons

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	Temperature (Cel.)	pH (std. Units)	ORP (mV)	Conductivity (mS/cm)	Turbitity (NTU)	Dissolved Oxygen (mg/L)	Salinity (%)	Comments/Observations
1535	0.4	Initial	16.64	6.20	201	0.474	4.9	0.00	0.2	Well Headspace PID =
1540	~~0.4~~	2	16.59	6.19	204	0.479	4.7	0.00	0.2	
1545	~~0.4~~	4	16.51	6.17	208	0.485	4.3	0.00	0.2	
1550	~~0.4~~	6	16.48	6.15	213	0.487	4.0	0.00	0.2	
1555	~~0.4~~	8	16.45	6.15	217	0.487	2.8	0.00	0.2	
1600	"	10	16.40	6.14	219	0.487	2.4	0.00	0.2	

*Removed Tubing

DRAFT

Monitoring Well Sample Data Form

Project: National Grid - Bay Shore OU-

Well ID: OU3MW-11S

Sample Date: 9-24-18

Total Well Depth (from top of casing): 15.15'

Depth to Water (from top of casing): 6.50'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1645 Finish: 1715

Purging Method: Peristaltic Pump

~~Sample Time~~: Start: 1720 Finish:

Sampling Method: Low Flow

Sample Analysis: ~~BTEX/PAH+2-Methylnaphthalene~~ 1,4 Dioxane/PFAS

3 well volumes = 4.23 gallons

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	Temperature (Cel.)	pH (std. Units)	ORP (mV)	Conductivity (mS/cm)	Turbitity (NTU)	Disolved Oxygen (mg/L)	Salinity (%)	Comments/Observations
1650	0.4	~~Initial~~ 1.5	19.68	6.39	-3	0.461	0.0	0.22	0.2	Well Headspace PID =
1655		2.5	19.62	6.44	-17	0.459	0.0	0.00	0.2	
1700		3.0	19.69	6.44	-19	0.453	0.0	0.00	0.2	
1705		3.5	19.92	6.41	-18	0.459	0.0	0.00	0.2	
1710		4.0	19.87	6.43	-20	0.439	0.00	0.00	0.2	
1715		4.5	19.83	6.43	-19	0.436	0.0	0.00	0.2	

* Removed Tubing

DRAFT

Well Sample Data Form

Project: National Grid - Bay Shore OU-1 **Well ID:** MW-09I **Sample Date:** 9-24-18

Total Well Depth (from top of casing): 44.17'

Depth to Water (from top of casing): 10.60'

Well Diameter: 3/4" (1") 2"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1425 Finish: 1500

Purging Method: Peristaltic Pump

Sample Time: Start: 1505 Finish:

Sample Analysis: ~~BTEX/PAH+2-Methylnaphthalene~~/PFAS

DRAFT

Purge Data									
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	Temperature (Cel.)	pH (std. units)	ORP (mV)	Conductivity (mS/cm)	Turbitity (NTU)	Disolved Oxygen (mg/L)	Salinity (%)	Comments/Observations
1430	0.4	Initial	15.96	6.9	165	0.229	1.7	6.69	0.1	Well Headspace PID =
1435		2	16.71	6.9	170	0.229	1.0	1.13	0.1	
1440		4	16.92	6.9	144	0.229	0.3	0.61	0.1	
1445		6	17.46	6.9	130	0.228	0.1	0.25	0.1	
1450		8	17.98	6.9	119	0.228	0.7	0.17	0.1	
1455		10	18.09	6.9	132	0.228	0.4	0.13	0.1	
1500	0.4	12	18.42	6.9	135	0.228	0.6	0.13	0.1	

Duplicate MW-100218

Monitoring Well Sample Data Form

Project: Clifton - PFAS Sampling **Well ID:** RW-2025 **Sample Date:** 10-2-18

Total Well Depth (from top of casing): 25.0'

Depth to Water (from top of casing): 1.90'

Well Diameter: 3/4" 1" 2" 4" (6")

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1245 Finish:

Purging Method: Peristaltic Pump

Sample Time: Start: 1300 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

1 well volume = 33 gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1250	~~0.4~~ ~~25~~	~~Initial~~ 25	7.95	0.485	0.0	2.26	17.77	0.2	-216	Well Headspace PID =
		~~2~~								
		~~4~~								Colorless
		~~6~~								Slight odor
		~~8~~								
		~~10~~								

* Well went dry @ 27.5 gallons, wait for recharge & then sample
Sample @ 1300
* Removed Tubing

*RW-210S had ~1' of product

Monitoring Well Sample Data Form

Project: Clifton PFAS Sampling **Well ID:** RW-210I **Sample Date:** 10-2-18

Total Well Depth (from top of casing): 40.0'

Depth to Water (from top of casing): 0.0'

Well Diameter: 3/4" 1" 2" (4")

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1505 Finish: 1535

Purging Method: Peristaltic Pump

~~**Sampling Method:**~~ Low Flow **Sample Time:** Start: 1540 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

1 well volume = 26 gallons

Purge Data										
Sample Time	Flow Rate (lpm/~~gpm~~)	Volume Purged (liters/~~gals.~~)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1510	~~0.4~~	~~Initial~~ 23	8.19	0.292	0.0	2.34	19.71	0.1	-122	Well Headspace PID =
1515		~~2~~ 24	8.11	0.303	0.0	0.28	17.56	0.1	-151	
1520		~~4~~ 25	8.18	0.300	0.0	0.00	18.81	0.1	-175	
1525		~~625~~ 53	8.19	0.299	0.0	0.00	19.29	0.1	-185	
1530		~~825.6~~	8.19	0.299	0.0	0.00	19.38	0.1	-191	
1535		~~1026~~	8.18	0.300	0.0	0.00	19.40	0.1	-193	

*Removed Tubing

DRAFT

MS/MSD

Monitoring Well Sample Data Form

Project: Clifton-PFAS Sampling **Well ID:** RW-23 **Sample Date:** 10-2-18

Total Well Depth (from top of casing): 13.15'

Depth to Water (from top of casing): 6.10'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 0905 Finish: 0935

Purging Method: Peristaltic Pump

Sample Time: Start: 0940 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

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Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
910	0.4	Initial	7.02	7.26	6.2	1.49	21.07	4.0	-65	Well Headspace PID =
915		2	7.02	7.40	0.0	0.64	20.99	4.1	-82	
920		4	7.01	7.37	0.0	0.17	21.03	4.1	-91	Colorless
925		6	7.01	7.35	0.0	0.00	21.09	4.0	-94	Slight Odor
930		8	7.01	7.35	0.0	0.00	21.07	4.0	-96	
935		10	7.01	7.36	0.0	0.00	21.10	4.0	-97	

Monitoring Well Sample Data Form

Project: Coney Island PFAS Sampling **Well ID:** MW-16 **Sample Date:** 10-5-18

Total Well Depth (from top of casing): 20.5'

Depth to Water (from top of casing): 13.00'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0730 Finish: 0800

Purging Method: Peristaltic Pump

Sample Time: Start: 0805 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

*No dedicated tubing

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0735	0.4	Initial	7.54	4.37	0.0	0.05	15.89	2.3	-251	Well Headspace PID =
0740		2	7.57	4.09	0.0	0.00	16.00	2.2	-276	
0745		4	7.58	4.03	0.0	0.00	16.02	2.1	-292	Colorless
0750		6	7.59	4.02	0.0	0.00	16.04	2.1	-303	Slight odor
0755		8	7.60	4.03	0.0	0.00	15.90	2.1	-309	
0800		10	7.60	4.03	0.0	0.00	15.87	2.1	-313	

Monitoring Well Sample Data Form

Project: emerging contaminants - Coney Island **Well ID:** MW-18 **Sample Date:** 10/5/18

Total Well Depth (from top of casing): ~~12.85'~~ 21'

Depth to Water (from top of casing): 11.85'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes / M Fannon

Purge Time: Start: 0730 Finish: 0808

Purging Method: Peristaltic Pump

Sample Time: Start: 0810 Finish: 0820

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

			✓	✓	✓ Purge Data ✓		✓		✓	
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0733	0.4	Initial	6.69	1.91	39.3	0.00	15.91		-100	Well Headspace PID =
0738		1g	6.81	1.87	19.7	0.00	15.99		-115	
0743		2g	6.80	1.96	17.0	0.00	15.93		-108	
0748		3g	6.80	1.98	7.7	0.00	15.87		-117	slowed down purge rate to lower turbidity.
0753		3.5g	6.80	2.05	4.5	0.00	15.83		-119	
0758		4g	6.79	2.05	3.1	0.00	15.88		-119	
0803		4.5g	6.80	2.05	3.2	0.00	15.90		-119	
0808		5g	6.80	2.05	3.2	0.00	15.91		-116	sample at 0810
										Dup-100518-1 at 0830

* dedicated tubing in well
3 well volumes = 4.47 gal

Monitoring Well Sample Data Form

Project: Carey Island - PFAS Sampling **Well ID:** MW-2 **Sample Date:** 10-5-18

Total Well Depth (from top of casing): 22.2'

Depth to Water (from top of casing): 10.85'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0825 Finish: 0855

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Time: Start: 0900 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0830	0.4	Initial	7.69	2.71	204	1.69	15.60	1.4	-246	Well Headspace PID =
0835		2	7.60	2.73	71.6	0.00	15.63	1.4	-273	
0840		4	7.58	2.73	22.4	0.00	15.77	1.4	-293	
0845		6	7.58	2.74	0.0	0.00	15.90	1.4	-299	
0850		8	7.62	2.78	0.0	0.00	16.12	1.4	-301	
0855		10	7.64	2.80	0.0	0.00	16.19	1.4	-301	

* Used Existing drum @ Carey Island site

DRAFT

MS/MSD

Monitoring Well Sample Data Form

Project: Equity - PFAS Sampling **Well ID:** MW-6B **Sample Date:** 10-12-18

Total Well Depth (from top of casing): 39.65'

Depth to Water (from top of casing): 9.80'

Well Diameter: 3/4" (1") 2" 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0735 Finish: 0805

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Time: Start: 0810 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0740	0.4	Initial	8.30	2.67	194	0.66	17.71	1.4	-120	Well Headspace PID =
0745		2	7.91	2.52	83	0.75	17.39	1.3	-71	
0750		4	7.96	2.56	0.0	0.45	17.43	1.4	-86	
0755		6	8.17	2.66	0.0	0.22	17.27	1.4	-111	
0800		8	8.18	2.66	0.0	0.11	17.23	1.4	-113	
0805		10	8.18	2.67	0.0	0.01	17.15	1.4	-115	

* Had to fix tubing + Horiba @0750. Not getting a proper flow.

DUP-101218

Monitoring Well Sample Data Form

Project: Equity - PFAS Sampling **Well ID:** MW-8B **Sample Date:** 10-12-18

Total Well Depth (from top of casing): 40.00'

Depth to Water (from top of casing): 6.20'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0915 Finish: 1020

Purging Method: Peristaltic Pump

Sample Time: Start: 1025 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

3 well volumes = 16.00 gallons

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0955	~~0.4~~ .2	~~Initial~~ 11	7.54	2.66	0.0	0.00	15.97	1.4	-352	Well Headspace PID =
1000	.2	~~2~~ 12	7.51	2.79	0.0	0.00	15.98	1.4	-354	
1005	.2	~~4~~ 13	7.50	2.66	0.0	0.00	15.98	1.4	-356	
1010	.2	~~6~~ 14	7.48	2.65	0.0	0.00	16.02	1.4	-357	
1015	.2	~~8~~ 15	7.47	2.69	0.0	0.00	16.00	1.4	-358	
1020	.2	~~10~~ 16	7.47	2.70	0.0	0.00	16.01	1.4	-358	

FB-101218 @0840

* Removed Tubing

Monitoring Well Sample Data Form

Project: Equity - PFAS Sampling **Well ID:** MW-11B **Sample Date:** 10-12-18

Total Well Depth (from top of casing): 45.5'

Depth to Water (from top of casing): 8.50'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1110 Finish: 1150

Purging Method: Peristaltic Pump

Sample Time: Start: 1155 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1115	0.4	Initial	11.86	3.16	96.8	0.00	18.94	1.7	-365	Well Headspace PID =
1120		2	8.81	8.19	74.2	0.00	18.81	4.6	-336	
1125		4	7.64	10.3	54.0	0.00	18.56	5.8	-351	
1130		6	7.17	11.3	22.1	0.00	18.52	6.4	-351	
1135		8	7.16	11.6	7.6	0.00	18.44	6.6	-358	
1140		10	7.17	11.7	4.5	0.00	18.46	6.7	-362	
1145		12	7.17	11.7	2.1	0.00	18.35	6.7	-367	
1150		14	7.17	11.8	0.0	0.00	18.32	6.7	-369	

MS/MSD

Monitoring Well Sample Data Form

Project: FAR ROCKAWAY - PFAS Sampling **Well ID:** MW-118DR **Sample Date:** 10-4-18

Total Well Depth (from top of casing): 34.8'

Depth to Water (from top of casing): 4.6'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 855 Finish: 1010

Purging Method: Peristaltic Pump

Sample Time: Start: 1015 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

3 well volumes = 15 gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/~~gpm~~)	Volume Purged (liters/~~gals.~~)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
945	0.4	Initial 11	5.72	0.633	0.0	0.77	16.16	0.3	262	Well Headspace PID =
950		2 12	5.71	0.633	0.0	0.11	16.16	0.3	263	
955		4 13	5.72	0.633	0.00	0.00	16.19	0.3	261	Colorless
1000		6 14	5.73	0.633	0.0	0.00	16.40	0.3	261	Odorless
1005		8 14.5	5.73	0.633	0.0C	0.00	16.52	0.3	259	
1010		10 15	5.73	0.634	0.0	0.00	16.54	0.3	259	

* AECOM + GEI onsite @ 0700. Did not meet w/ flagger until 0830. CH could not find MW-116D. LIRR
Megan w/ AECOM found well @ 1045. CH begin MW-119D @ 1100
* Removed Tubing

Duplicate
DUP-100418-1

Monitoring Well Sample Data Form

Project: FAR ROCKAWAY - PFAS Sampling **Well ID:** MW-119D **Sample Date:** 10-4-18

Total Well Depth (from top of casing): 38.0'

Depth to Water (from top of casing): 3.20'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 11⁰⁰ Finish: 12¹⁵

Purging Method: Peristaltic Pump

Sample Time: Start: 12²⁰ Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

3 well volumes - 17 gallons

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1150	0.4	Initial/14	5.92	0.517	0.0	0.31	18.14	0.2	242	Well Headspace PID =
1155		2/15	5.89	0.520	0.0	0.00	17.89	0.3	243	
1200		4/16	5.86	0.526	0.0	0.00	17.87	0.3	244	
1205		6/17	5.82	0.535	0.0	0.00	17.83	0.3	246	
1210		8/17.5	5.80	0.537	0.0	0.00	17.82	0.3	246	
1215		10/18	5.79	0.536	0.0	0.00	17.81	0.3	247	

* Removed Tubing

FB-100418 @ 1230

Monitoring Well Sample Data Form

Project: Far Rockaway-PFAS Sampling **Well ID:** MW-116D **Sample Date:** 10-4-18

Total Well Depth (from top of casing): 38.5'

Depth to Water (from top of casing): 5.55'

Well Diameter: 3/4" 1" (2) 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1235 Finish: 1405

Purging Method: Peristaltic Pump

Sample Time: Start: 1410 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

3 well volumes = 16.14 gallons

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1340	0.4	Initial	5.56	0.627	0.0	0.08	18.00	0.3	201	Well Headspace PID =
1345		2	5.52	0.635	0.0	0.00	18.11	0.3	205	
1350		4	5.53	0.633	0.0	0.00	18.01	0.3	201	
1355		6	5.53	0.631	0.0	0.00	17.95	0.3	200	
1400		8	5.54	0.632	0.0	0.00	17.90	0.3	201	
1405		10	5.54	0.632	0.0	0.00	17.91	0.3	202	

* Remove & Tubing

DRAFT

MS/MSD

Monitoring Well Sample Data Form

Project: Flathouse - PFAS Sampling **Well ID:** MW-2 **Sample Date:** 10-9-18

Total Well Depth (from top of casing): 59.00'

Depth to Water (from top of casing): 45.80'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1030 Finish: 1115

Purging Method: Peristaltic Pump

Sample Time: Start: 1120 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1050	0.4	Initial	6.66	1.09		6.44	20.74	0.5	216	Well Headspace PID =
1055		2	6.68	1.03		5.66	21.04	0.5	222	
1100		4	6.68	1.00		5.59	21.11	0.5	224	
1105		6	6.69	0.783		5.53	21.04	0.4	225	
1110		8	6.69	0.761		5.49	20.85	0.4	225	
1115		10	6.70	0.749		5.43	20.71	0.4	225	

DUP-100918

Monitoring Well Sample Data Form

Project: Flat bush - PFAS Sampling **Well ID:** MW-7 **Sample Date:** 10-9-18

Total Well Depth (from top of casing): 59.0'

Depth to Water (from top of casing): 48.0'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1230 Finish: 1305

Purging Method: Peristaltic Pump

Sample Time: Start: 1310 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1235	0.4	Initial	7.06	1.11	0.0	1.25	19.42	0.5	197	Well Headspace PID =
1240		2	7.08	1.04	0.0	1.27	19.19	0.5	195	
1245		4	7.10	1.19		1.19	18.98	0.4	192	
1250		6	7.09	0.838		1.20	18.84	0.4	191	
1255		8	7.09	0.832		1.26	18.79	0.4	191	
1300		10	7.09	0.832		1.26	18.74	0.4	191	
1305		12	7.09	0.831		1.27	18.75	0.4	191	

Monitoring Well Sample Data Form

Project: Flatbush - PFAS Sampling **Well ID:** MW-4 **Sample Date:** 10-9-18

Total Well Depth (from top of casing): 59.00'

Depth to Water (from top of casing): 47.10'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1350 Finish: 1420

Purging Method: Peristaltic Pump

Sample Time: Start: 1425 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1355	0.4	Initial	6.97	0.498		6.60	19.21	0.2	189	Well Headspace PID =
1400		2	6.95	0.478		0.30	18.99	0.2	189	
1405		4	6.91	0.466		0.03	18.79	0.2	192	
1410		6	6.86	0.466		0.00	18.63	0.2	196	
1415		8	6.84	0.469		0.00	18.54	0.2	198	
1420		10	6.83	0.470		0.00	18.51	0.2	199	

FB @ 1430

MS/MSD

Monitoring Well Sample Data Form

Project: Fulton - PFAS Sampling **Well ID:** FW-MW-17 **Sample Date:** 10-11-18

Total Well Depth (from top of casing): 16.25

Depth to Water (from top of casing): 6.65'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0825 Finish: 0855

Purging Method: Peristaltic Pump

Sample Time: Start: 0900 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0830	0.4	Initial	7.10	4.58	107	0.22	23.38	2.5	-67	Well Headspace PID =
0835		2	7.10	4.68	11.2	0.00	23.07	2.5	-84	
0840		4	7.10	4.71	0.0	0.00	22.85	2.5	-89	
0845		6	7.11	4.86	0.0	0.00	22.68	2.6	-94	
0850		8	7.11	4.93	0.0	0.00	22.59	2.6	-96	
0855		10	7.11	4.91	0.0	0.00	22.57	2.6	-96	

DUP-101118

Monitoring Well Sample Data Form

Project: Fulton-PFAS Sampling **Well ID:** FW-MW-19 **Sample Date:** 10-11-18

Total Well Depth (from top of casing): 14.75'

Depth to Water (from top of casing): 6.45'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: ~~0950~~ 0940 Finish: ~~1020~~ CH 1010

Purging Method: Peristaltic Pump

Sample Time: Start: ~~1025~~ CH 1015 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
~~0950~~ 0940	0.4	Initial	7.65	2.68	44.2	0.00	21.11	1.4	-42	Well Headspace PID =
0950		2	7.64	2.59	4.9	0.00	21.16	1.3	-37	
0955		4	7.58	2.45	0.0	0.00	21.17	1.3	-64	
~~1000~~ 1000		6	7.56	2.39	0.0	0.00	21.13	1.2	-71	
~~1005~~ 1005		8	7.54	2.36	0.0	0.00	21.08	1.2	-75	
~~1010~~ 1010		10	7.54	2.34	0.0	0.00	21.04	1.2	-77	

Monitoring Well Sample Data Form

Project: Fulton-PFAS Sampling **Well ID:** FW-MW-04 **Sample Date:** 10-11-18

Total Well Depth (from top of casing): 12.00'

Depth to Water (from top of casing): 7.45'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1030 Finish: 1100

Purging Method: Peristaltic Pump

Sample Time: Start: 1105 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1035	0.4	Initial	7.12	1.30	0.0	1.20	22.38	0.6	-120	Well Headspace PID =
1040		2	7.12	1.28	0.0	0.49	22.33	0.6	-117	
1045		4	7.11	1.29	0.0	0.17	22.27	0.6	-114	
1050		6	7.08	1.33	0.0	0.00	22.22	0.7	-120	
1055		8	7.08	1.31	0.0	0.00	22.19	0.7	-123	
1100		10	7.08	1.29	0.0	0.00	22.17	0.7	-128	

FB-101118 @ 1115

Monitoring Well Sample Data Form

Project: Fulton - PFAS Sampling **Well ID:** FW-MW-5R **Sample Date:** 10-11-18

Total Well Depth (from top of casing): 17.701

Depth to Water (from top of casing): 12.95

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1120 Finish: 1150

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Time: Start: 1155 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1125	0.4	Initial	7.09	0.616	11.3	0.00	19.45	0.3	-98	Well Headspace PID =
1130		2	7.08	0.620	1.2	0.00	19.54	0.3	-101	
1135		4	7.08	0.622	0.0	0.00	19.47	0.3	-103	
1140		6	7.09	0.623	0.0	0.00	19.36	0.3	-105	
1145		8	7.09	0.623	0.0	0.00	19.23	0.3	-107	
1150		10	7.09	0.624	0.0	0.00	19.23	0.3	-107	

MS/MSD

Monitoring Well Sample Data Form

Project: Glen Cove PFAS Sampling **Well ID:** GCMW-14S-R **Sample Date:** 9-25-18

Total Well Depth (from top of casing): 18.40'

Depth to Water (from top of casing): 10.60'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0755 Finish: 0825

Purging Method: Peristaltic Pump

Sample Time: Start: 0830 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

*3 well volumes 3.81 gallons

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0800	0.4	~~Initial~~ 1	6.62	0.680	0.0	9.92	17.98	0.3	240	Well Headspace PID =
0805		~~2~~ 1.5	6.57	0.664	291	8.95	17.67	0.3	~~247~~	
0810		~~4~~ 2	6.54	0.672	281	8.10	17.62	0.3	255	COLORLESS
0815		~~8~~ 3	6.53	0.665	264	7.68	17.55	0.3	260	ODORLESS
0820		~~8~~ 4	6.53	0.676	292	7.47	17.59	0.3	264	
0825		~~10~~	6.53	0.646	272	7.31	17.46	0.3	265	

* Removed Tubing

DRAFT

Duplicate MW-XX-092518

Monitoring Well Sample Data Form

Project: Glen Cove PFAS Sampling **Well ID:** PZ-06 **Sample Date:** 9-25-18

Total Well Depth (from top of casing): 16.10'

Depth to Water (from top of casing): 6.00'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0900 Finish: 0935

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Time: Start: 0940 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

*3well Volumes = 4.95gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0905	0.4	Initial 1	6.39	0.271	27.2	0.97	16.91	0.1	141	Well Headspace PID =
0910		2	6.36	0.269	22.7	0.45	16.90	0.1	147	
095		3	6.36	0.271	14.5	0.00	16.87	0.1	169	COLORLESS
0920		3.5	6.36	0.270	15.1	0.00	16.87	0.1	180	ODORLESS
0925		4.5	6.35	0.270	13.4	0.00	16.89	0.1	188	
0930		4.75	6.34	0.270	13.2	0.00	16.92	0.1	192	
0935		5	6.34	0.269	13.1	0.00	16.91	0.1	197	

*Removed Tubing

Monitoring Well Sample Data Form

Project: Glen Cove PFAS Sampling **Well ID:** GCRW-03 **Sample Date:** 9-25-18

Total Well Depth (from top of casing): 27.00'

Depth to Water (from top of casing): 10.02'

Well Diameter: 3/4" 1" 2" (3") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1040 Finish:

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Time: Start: Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

*3 Well Volumes = 18.69 gallons

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1045	0.4	Initial (9)	8.03	0.180	181	1.23	18.06	0.1	196	Well Headspace PID =
1050		~~2~~	8.09	0.221	150	1.72	18.00	0.1	183	
1055		~~4~~								Colorless
1100		~~6~~								Odorless
1105		~~8~~								
1110		~~10~~								

* Well went dry after 8gallons * Removed Tubing

* Sample @ 1130

DRAFT

MS/MSD

Monitoring Well Sample Data Form

Project: Greenpoint PFAS Sampling **Well ID:** GPEC-MW-11 **Sample Date:** 10-1-18

Total Well Depth (from top of casing): 49.3'

Depth to Water (from top of casing): 10.5'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 820 Finish: 925

Purging Method: Peristaltic Pump

Sample Time: Start: 930 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
825	0.4	Initial	7.02	0.182	196	4.61	16.61	0.1	213	Well Headspace PID =
830		2	7.32	0.195	94.2	2.68	16.06	0.1	221	
835		4	7.33	0.241	131	1.82	15.96	0.1	214	
840		6	7.30	0.281	73.7	1.30	15.89	0.1	206	
845		8	7.26	0.319	57.0	0.97	15.83	0.2	197	
850		10	7.21	0.374	42.7	0.60	15.81	0.2	185	
855		12	7.17	0.411	42.8	0.49	15.78	0.2	173	
900		14	7.11	0.462	41.9	0.33	15.69	0.2	160	
905		16	7.06	0.516	26.7	0.19	15.68	0.2	150	
910		18	7.01	0.596	25.2	0.06	15.66	0.2	142	
920		20	6.97	0.643	25.6	0.00	15.63	0.2	138	
925		22	6.93	0.693	23.4	0.00	15.66	0.2	134	

Duplicate
MW-XX-20118

Monitoring Well Sample Data Form

Project: GreenPoint - PFAS Sampling **Well ID:** GPEC - MW-35 **Sample Date:** 10-1-18

Total Well Depth (from top of casing): 41.0'

Depth to Water (from top of casing): 4.9'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" ~~1"~~ (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1235 Finish: 1305

Purging Method: Peristaltic Pump

Sample Time: Start: 1310 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1240	0.4	Initial	7.08	0.000	137	7.63	18.01	0.0	41	Well Headspace PID =
1245		2	6.95	0.000	159	6.70	17.67	0.0	45	
1250		4	6.60	0.000	161	6.46	17.52	0.0	68	colorless
1255		6	6.61	0.000	170	6.20	17.40	0.0	63	Strong odor
1300		8	6.63	0.000	173	5.97	17.43	0.0	57	
1305		10	6.68	0.000	169	5.79	17.26	0.0	59	

Monitoring Well Sample Data Form

Project: GreenPoint-PFAS Sampling **Well ID:** ~~GCC~~ GPEC-220I **Sample Date:** 10-1-18

Total Well Depth (from top of casing): 50.01 **Depth to Water (from top of casing):** 18.91

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes **Purge Time:** Start: 1405 Finish: 1435

Purging Method: Peristaltic Pump **Sample Time:** Start: 1440 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1410	0.4	Initial	6.56	0.654	0.0	1.09	18.28	0.3	179	Well Headspace PID =
1415		2	6.50	0.739	0.0	0.36	18.12	0.4	181	
1420		4	6.47	0.755	0.0	0.20	18.01	0.4	182	COLORLESS
1425		6	6.44	0.774	0.0	0.08	17.66	0.4	186	ODORLESS
1430		8	6.43	0.780	0.0	0.06	17.56	0.4	187	
1435		10	6.43	0.782	0.0	0.03	17.54	0.4	180	

FB - 1400

MS/MSD

Monitoring Well Sample Data Form

Project: Inwood-PFAS Sampling **Well ID:** GW-8 **Sample Date:** 10-23-18

Total Well Depth (from top of casing): 20.01'

Depth to Water (from top of casing): 12.51'

Well Diameter: 3/4" 1" 2" (4")

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0810 Finish: 0910

Purging Method: Peristaltic Pump

Sample Time: Start: 0915 Finish:

Sampling Method: Low Flow

Sample Analysis: PFAS / 1,4 Dioxane

3 well volumes - 14.7 gallons

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/(gpm))	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0845	~~0.4~~ .2	~~Initial~~ 10	6.87	2.11	6.5	3.37	12.76	1.1	194	Well Headspace PID =
0850	.2	~~2~~ 11	6.86	2.11	3.2	2.45	12.80	1.1	195	
0855	.2	~~4~~ 12	6.87	2.11	2.9	2.16	12.86	1.1	198	
0900	.2	~~6~~ 13	6.86	2.11	2.4	2.12	12.89	1.1	200	
0905	.2	~~8~~ 14	6.86	2.11	2.3	2.08	12.89	1.1	200	
0910	.2	~~10~~ 15	6.86	2.11	2.1	2.03	12.91	1.1	200	

*Removed Tubing

FB-102318@0930

DUP-102318

Monitoring Well Sample Data Form

Project: Inwood - PFAS Sampling **Well ID:** MW-165 **Sample Date:** 10-23-18

Total Well Depth (from top of casing): 14.5'

Depth to Water (from top of casing): 8.00'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1030 Finish: 1100

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Time: Start: 1105 Finish:

Sample Analysis: PFAS / 1,4 Dioxane

3 well volumes - 3.18 gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1035	0.1	~~Initial~~ .5	6.68	4.93	40.3	1.27	14.59	2.6	-98	Well Headspace PID =
1040	.2	~~2~~ 1	6.67	4.92	11.4	0.71	15.10	2.6	-105	
1045	.2	~~4~~ 2	6.68	4.96	4.6	0.64	15.21	2.6	-107	
1050	.2	~~6~~ 3	6.68	4.97	0.0	0.53	15.14	2.7	-107	
1055	.2	~~8~~ 4	6.68	4.96	0.0	0.54	15.00	2.7	~~-107~~	
1100	.2	~~10~~ 5	6.68	4.96	0.0	0.51	15.03	2.7	-105	

*Removed Tubing

Monitoring Well Sample Data Form

Project: Inwood - PFAS Sampling **Well ID:** MW-52I **Sample Date:** 10-23-18

Total Well Depth (from top of casing): 24.5'

Depth to Water (from top of casing): 5.5'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1155 Finish: 1240

Purging Method: Peristaltic Pump

Sample Time: Start: 1245 Finish:

Sampling Method: Low Flow

Sample Analysis: PFAS/1,4 Dioxane 3well Volumes - 9.30 gallons

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/(gpm))	Volume Purged (liters/(gals))	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1215	~~0.4~~	~~Initial~~ 5	6.63	2.03	26.4	0.94	15.73	1.0	-56	Well Headspace PID =
1220	.2	~~2~~ 6	6.64	2.01	12.4	0.59	15.69	1.0	-57	
1225	.2	~~4~~ 7	6.63	2.02	3.1	0.45	15.67	1.0	-55	
1230	.2	~~8~~ 8	6.62	2.02	0.0	0.38	15.68	1.0	-57	
1235	.2	~~8~~ 9	6.63	2.03	0.0	0.33	15.75	1.0	-59	
1240	.2	~~10~~ 10	6.63	2.03	0.0	0.41	15.76	1.0	-60	

* Removed Tubing

Monitoring Well Sample Data Form

Project: Kings County - PFAS Sampling **Well ID:** KC-MW-09 **Sample Date:** 10-5-18

Total Well Depth (from top of casing): 15.20'

Depth to Water (from top of casing): 9.10'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1020 Finish: 1050

Purging Method: Peristaltic Pump

~~Sampling Method:~~ Low Flow

Sample Time: Start: 1055 Finish:

Sample Analysis: 1, 4 Dioxane & PFAS

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1025	0.4	Initial	805	14.7	13.5	19.20 ↔ 0.51		8.4	-288	Well Headspace PID =
1030		2	7.77	14.2	0.0	0.00	20.00	8.3	-277	
1035		4	7.76	14.2	0.0	0.00	20.72	8.2	-278	
1040		6	7.76	14.4	0.0	0.00	20.75	8.3	-281	
1045		8	7.75	14.3	0.0	0.00	20.75	8.3	-282	
1050		10	7.75	14.3	0.0	0.00	20.77	8.3	-282	

DRAFT

Monitoring Well Sample Data Form

Project: Emerging Contaminants - Kings County former MGP **Well ID:** KC-MW-05 **Sample Date:** 10/5/2018

Total Well Depth (from top of casing): 17.92'

Depth to Water (from top of casing): 6.67'

Well Diameter: 3/4" 1" 2" 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes M. Fannon

Purge Time: Start: 1053 Finish: 1125

Purging Method: Peristaltic Pump

Sample Time: Start: 1125 Finish: 1135

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

						Purge Data ✓				
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1055	0.4	Initial	6.70	6.46	8.8	6.00	18.49		-90	Well Headspace PID =
1100		2	6.23	6.36	7.6	0.00	18.81		-71	NLO
1105		4	6.21	5.59	14.8	0.00	18.91		-88	
1110		6	6.21	5.21	14.6	0.00	19.11		-98	
1115		8	6.18	5.25	20.2	0.00	19.31		-106	
1120		10	6.15	5.29	20.4	0.00	19.47		-113	
1125		2.25g	6.14	5.29	19.7	0.00	19.58		-116	Collected Sample at 1125
										Dup-100518-2 at 1135
										Screen on water in purge bucket

DRAFT

Monitoring Well Sample Data Form

Project: Kings County - PFAS Sampling **Well ID:** KC-MW-01 **Sample Date:** 10-5-18

Total Well Depth (from top of casing): 32.50'

Depth to Water (from top of casing): 22.55'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" 2" 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1120 Finish: 1200

Purging Method: Peristaltic Pump

Sample Time: Start: 1205 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1125	0.4	Initial	7.19	2.91	756	5.13	18.96	1.5	-26	Well Headspace PID =
1130		2	7.12	2.87	347	3.74	18.96	1.5	-14	
1135		4	7.10	2.88	185	3.14	19.40	1.5	10	
1140		6	7.09	2.88	137	3.01	19.45	1.5	25	
1145		8	7.08	2.88	101	2.65	19.55	1.5	36	
1150		10	7.07	2.88	71.5	2.48	19.54	1.5	41	
1155		12	7.05	2.88	38.2	2.41	19.40	1.5	47	
1200		14	7.04	2.88	9.9	2.28	19.30	1.5	51	

* Water is clear ~~odor~~

MS/MSD

Monitoring Well Sample Data Form

Project: Patchogue PFAS SAMPLING **Well ID:** MW-45 **Sample Date:** 9-25-18

Total Well Depth (from top of casing): 12.28'

Depth to Water (from top of casing): 4.80'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Purge Time: Start: 1355 Finish: 1425

Sampling Crew: Craig Hayes

Purging Method: Peristaltic Pump

Sample Time: Start: 1430 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1400	0.4	~~Initial~~ 1	7.33	0.270	94.2	1.15	17.35	0.1	-92	Well Headspace PID =
1405		~~2~~	7.33	0.271	36.0	0.00	17.36	0.1	-105	
1410		~~4~~	7.36	0.270	16.5	0.00	17.69	0.1	-109	Colorless to Brown
1415		~~6~~	7.35	0.270	2.3	0.00	17.76	0.1	-112	Odorless
1420		~~8~~	7.35	0.270	0.0	0.00	17.71	0.1	-113	
1425		~~10~~	7.35	0.269	0.0	0.00	17.73	0.1	-113	

* Purge Water Stored in existing drums on-site

Duplicate
MW-XX-092518

Monitoring Well Sample Data Form

Project: Patchogue PFAS Sampling **Well ID:** MW-375 **Sample Date:** 9-25-18

Total Well Depth (from top of casing): 12.50'

Depth to Water (from top of casing): 4.31'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Purge Time: Start: 1450 Finish: 1520

Sampling Crew: Craig Hayes

Sample Time: Start: 1525 Finish:

Purging Method: Peristaltic Pump

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1455	0.4	Initial	7.24	0.332	21.0	0.20	19.48	0.2	-93	Well Headspace PID =
1500		2	7.24	0.321	12.3	0.00	19.50	0.2	-96	
1505		4	7.25	0.316	8.2	0.00	19.50	0.1	-100	COLORLESS
1510		6	7.26	0.312	6.5	0.00	19.51	0.1	-104	ODORLESS
1515		8	7.26	0.310	6.7	0.00	19.53	0.1	-106	
1520		10	7.26	0.309	6.5	0.00	19.54	0.1	-107	

* Purge water stored in existing drum on site

Monitoring Well Sample Data Form

Project: Patchogue PFAS Sampling **Well ID:** MW-1 **Sample Date:** 9-25-18

Total Well Depth (from top of casing): 15.50'

Depth to Water (from top of casing): 5.75'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" 2" 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1540 Finish: 1615

Purging Method: Peristaltic Pump

Sample Time: Start: 1620 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1545	0.4	Initial	7.09	2.13	37.6	0.28	21.32	1.1	-40	Well Headspace PID =
1550		2	7.07	2.18	18.5	0.00	21.35	1.1	-44	
1555		4	7.03	2.36	16.3	0.00	21.28	1.2	-46	Colorless to Brown
1600		6	7.01	2.47	15.2	0.00	21.28	1.3	-47	Slight ODOR
1605		8	7.00	2.51	11.1	0.00	21.22	1.3	-47	
1610		10	6.99	2.51	12.1	0.00	21.04	1.3	-48	
1615		12	6.99	2.50	11.1	0.00	20.92	1.3	-48	

Glen Cove - 1745
Patchogue - 1755

MS/MSD

Monitoring Well Sample Data Form

Project: Peoples - PFAS Sampling **Well ID:** PWMW-01 **Sample Date:** 9-26-18

Total Well Depth (from top of casing): 18.65'

Depth to Water (from top of casing): 4.83'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 820 Finish: 855

Purging Method: Peristaltic Pump

Sample Time: Start: 900 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
825	0.4	Initial	6.58	0.827	75.2	3.23	18.42	0.4	227	Well Headspace PID =
830		2	6.66	0.764	52.6	2.97	18.46	0.4	218	
835		4	6.69	0.753	29.6	2.30	18.39	0.4	210	
840		6	6.71	0.749	8.7	2.16	18.53	0.4	205	
845		8	6.72	0.743	0.0	1.95	18.56	0.4	198	
850		10	6.73	0.739	0.0	1.94	18.60	0.4	195	
855		12	6.73	0.738	0.0	1.91	18.62	0.4	194	

Duplicate
MW-XX-092618

Monitoring Well Sample Data Form

Project: Peoples - PFAS Sampling **Well ID:** MW-11 **Sample Date:** 9-26-18

Total Well Depth (from top of casing): 17.6'

Depth to Water (from top of casing): 8.00'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0930 Finish: 1000

Purging Method: Peristaltic Pump

Sample Time: Start: 1005 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
935	0.4	Initial	7.07	1.77	0.7	0.77	18.26	0.9	10	Well Headspace PID =
940		2	7.07	1.76	0.0	0.11	18.48	0.9	-2	
945		4	7.08	1.78	0.0	0.00	18.16	0.9	-18	Colorless
950		6	7.14	1.68	0.0	0.00	18.29	0.8	-47	Some Odor
955		8	7.23	1.56	0.0	0.00	18.27	0.8	-69	
1000		10	7.24	1.48	0.0	0.00	18.12	0.8	-76	

Monitoring Well Sample Data Form

Project: Peoples - PFAS Sampling **Well ID:** MW-9 **Sample Date:** 9-26-18

Total Well Depth (from top of casing): 16.60'

Depth to Water (from top of casing): 6.50'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1040 Finish: 1110

Purging Method: Peristaltic Pump

Sample Time: Start: 1115 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1045	0.4	Initial	7.18	30.8	222	0.11	19.89	19.1	-240	Well Headspace PID =
1050		2	7.10	30.5	86.7	0.00	20.99	18.9	-243	
1055		4	7.08	30.7	22.1	0.00	21.14	19.0	-238	Dark Color
1100		6	7.07	30.7	1.4	0.00	21.20	19.0	-230	Strong Odor
1105		8	7.06	30.7	0.0	0.00	21.27	19.0	-226	
1110		10	7.05	30.7	0.0	0.00	21.30	19.0	-222	

Monitoring Well Sample Data Form

Project: Rockaway-PFAS Sampling **Well ID:** MW-26S **Sample Date:** 9-28-18

Total Well Depth (from top of casing): 13.15'

Depth to Water (from top of casing): 5.20'

Well Diameter: 3/4" (1") 2" 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1200 Finish: 1230

Purging Method: Peristaltic Pump

Sample Time: Start: 1235 Finish: 0.96

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

3 well volumes = ~~0.32~~ gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1205	0.4	Initial .1	7.26	3.33	33.6	2.62	19.66	1.7	-103	Well Headspace PID =
1210		~~2~~ .2	7.21	3.14	0.0	0.31	19.78	1.6	-95	
1215		~~4~~ .4	7.19	3.01	0.0	0.08	19.66	1.6	-85	colorless
1220		~~6~~ .8	7.17	2.92	0.0	0.02	19.64	1.5	-78	odorless
1225		~~8~~ .9	7.16	2.89	0.0	0.00	19.64	1.5	-74	
1230		~~10~~ 1	7.16	2.88	0.0	0.00	19.60	1.5	-72	

FB@1240 *Removed Tubing

Duplicate
MW-xx-092818

Monitoring Well Sample Data Form

Project: Rockaway-PFAS sampling **Well ID:** RW-05A **Sample Date:** 9-28-18

Total Well Depth (from top of casing): 27.00'

Depth to Water (from top of casing): 7.00'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" 2" (4")

Sampling Crew: Craig Hayes

Purge Time: Start: 1045 Finish: 1115

Purging Method: Peristaltic Pump

Sample Time: Start: 1120 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

3 well Volumes = 39.18 gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1050	0.4	10 Initial 10	7.78	0.756	5.4	0.72	15.92	0.4	-285	Well Headspace PID =
1055		11 2 10.2	7.78	0.742	1.1	0.32	15.88	0.4	-287	
1100		12 2 10.4	7.79	0.731	0.0	0.04	15.87	0.4	-295	COLORLESS
1105		13 6 10.6	7.79	0.702	0.0	0.00	15.85	0.3	-300	Strong ODOR
1110		14 8 10.	7.80	0.695	0.0	0.00	15.91	0.3	-302	
1115		15 10	7.81	0.681	0.0	0.00	15.89	0.3	-307	

* Only purged 1 well volume

* Removed Tubing

MS/MSD

Monitoring Well Sample Data Form

Project: Rockaway-PFAS Sampling **Well ID:** MW-025 **Sample Date:** 9-28-18

Total Well Depth (from top of casing): 16.5'

Depth to Water (from top of casing): 9.00'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" 1" (2") 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 0950 Finish: 1020

Purging Method: Peristaltic Pump

Sample Time: Start: 1025 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

*3 well volumes = 3.66 gallons

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0955	0.4	~~Initial~~	7.32	4.77	1.2	0.00	17.84	2.5	-251	Well Headspace PID =
1000		~~2~~	7.36	4.52	0.9	0.00	18.04	2.4	-272	
1005		~~4~~	7.37	4.43	0.8	0.00	18.12	2.4	-278	Clear to Dark
1010		~~6~~	7.40	4.33	0.0	0.00	18.23	2.3	-283	Strong ODR
1015		~~8~~	7.41	4.30	0.0	0.00	18.29	2.2	-285	
1020		~~10~~	7.42	4.26	0.0	0.00	18.28	2.2	-285	

* Removed Tubing

MS/MSD

Monitoring Well Sample Data Form

Project: Sag Harbor - PFAS Samping **Well ID:** SHMW-01IR **Sample Date:** 9-27-18

Total Well Depth (from top of casing): 42.5'

Depth to Water (from top of casing): 2.00'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" (1") 2" 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1155 Finish: 1225

Purging Method: Peristaltic Pump

Sample Time: Start: 1230 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1200	0.4	Initial	6.38	0.215	0.0	0.17	16.38	0.1	171	Well Headspace PID =
1203		2	6.35	0.201	0.0	0.00	16.18	0.1	176	
1210		4	6.33	0.200	0.0	0.00	16.14	0.1	180	
1215		6	6.32	0.199	0.0	0.00	16.19	0.1	182	
1220		8	6.31	0.198	0.0	0.00	16.06	0.1	185	
1225		10	6.31	0.198	0.0	0.00	16.13	0.1	186	

Duplicate
MW-xx-092718

Monitoring Well Sample Data Form

Project: Sag Harbor - PFAS Sampling **Well ID:** SHMW-13I **Sample Date:** 9-27-18

Total Well Depth (from top of casing): 46.5'

Depth to Water (from top of casing): 0.95'

Pump Intake Depth (Mid-Point of Screen Zone):

Well Diameter: 3/4" (1") 2" 4"

Sampling Crew: Craig Hayes

Purge Time: Start: 1300 Finish: 1330

Purging Method: Peristaltic Pump

Sample Time: Start: 1335 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1305	0.4	Initial	6.08	0.245	429	1.16	17.88	0.1	30	Well Headspace PID =
1310		2	5.97	0.238	80.3	0.96	17.17	0.1	87	
1315		4	5.93	0.236	0.0	0.88	17.01	0.1	135	
1320		6	5.92	0.237	0.0	0.90	16.37	0.1	166	
1325		8	5.90	0.238	0.0	0.90	16.27	0.1	170	
1330		10	5.89	0.238	0.0	0.89	16.21	0.1	176	

Monitoring Well Sample Data Form

Project: Sag Harbor - PFAS Sampling **Well ID:** SH MW-03I **Sample Date:** 9-27-18

Total Well Depth (from top of casing): 45.0'

Depth to Water (from top of casing): 1.58'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1405 Finish: 1440

Purging Method: Peristaltic Pump

Sample Time: Start: 1445 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1410	0.4	Initial	6.47	0.052	63.2	3.31	18.10	0.0	185	Well Headspace PID =
1415		2	6.26	0.052	39.2	1.02	19.03	0.0	201	
1420		4	6.28	0.179	36.9	0.32	18.89	0.1	198	
1425		6	6.28	0.185	15.1	0.09	18.79	0.1	197	
1430		8	6.27	0.192	3.7	0.00	18.61	0.1	199	
1435		10	6.27	0.194	0.0	0.00	18.50	0.1	201	
1440		12	6.26	0.197	0.0	0.00	18.43	0.1	202	

*Grab Bolt Cutters + Lock

MS/MSD + DUP-100318-2

Monitoring Well Sample Data Form

Project: Skillman - PFAS Sampling **Well ID:** SSMW-03 **Sample Date:** 10-3-18

Total Well Depth (from top of casing): 21.90'

Depth to Water (from top of casing): 10.00'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 1115 Finish: 1145

Purging Method: Peristaltic Pump

Sample Time: Start: 1150 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1120	0.4	Initial	7.58	2.98	52.8	0.03	20.20	1.5	-156	Well Headspace PID =
1125		2	7.68	2.95	46.1	0.00	20.35	1.5	-173	
1130		4	7.79	2.91	26.8	0.00	20.68	1.5	-186	Colorless
1135		6	7.81	2.88	27.8	0.00	21.09	1.5	-190	Odorless
1140		8	7.77	2.87	28.2	0.00	21.12	1.5	-193	
1145		10	7.76	2.88	27.6	0.00	21.20	1.5	-194	

FB @ 1110

Monitoring Well Sample Data Form

Project: Skillman-PFAS Sampling **Well ID:** SSMW-05 **Sample Date:** 10-3-18

Total Well Depth (from top of casing): 22.4' **Depth to Water (from top of casing):** 15.5'

Well Diameter: 3/4" 1" (2") 4" **Pump Intake Depth (Mid-Point of Screen Zone):**

Sampling Crew: Craig Hayes **Purge Time:** Start: 1255 Finish:

Purging Method: Peristaltic Pump **Sample Time:** Start: 1325 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1300	0.4	Initial	7.12	4.14	23.0	1.12	20.05	2.2	123	Well Headspace PID =
1305		2	7.09	4.21	11.2	0.79	19.66	2.2	118	
1310		4	7.08	4.19		0.81	19.65	2.2	117	Colorless
1316		6								No Odor
1320		8								
1325		10								

* Well went dry, waited for recharge + take samples @ 1325

MS/MSD
DUP-100318-1

Monitoring Well Sample Data Form

Project: Wythe - PFAS Sampling **Well ID:** WA-MW-04 **Sample Date:** 10-3-18

Total Well Depth (from top of casing): 19.3'

Depth to Water (from top of casing): 10.5'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0855 Finish: 0925

Purging Method: Peristaltic Pump

Sample Time: Start: 0930 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data										
Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
0900	0.4	Initial	6.90	2.64	156	0.41	18.97	1.4	-105	Well Headspace PID =
0905		2	6.88	2.63	32.5	0.09	19.11	1.4	-103	
0910		4	6.86	2.54	6.7	0.00	19.26	1.3	-102	Colorless
0915		6	6.84	2.53	0.0	0.00	19.30	1.3	-102	Slight odor
0920		8	6.84	2.54	0.0	0.00	19.31	1.3	-101	
0925		10	6.83	2.55	0.0	0.00	19.29	1.3	-99	

Monitoring Well Sample Data Form

Project: Wythe - PFAS Sampling **Well ID:** WA-MW-01 **Sample Date:** 10-3-18

Total Well Depth (from top of casing): 18.48'

Depth to Water (from top of casing): 9.80'

Well Diameter: 3/4" 1" (2") 4"

Pump Intake Depth (Mid-Point of Screen Zone):

Sampling Crew: Craig Hayes

Purge Time: Start: 0955 Finish: 1025

Purging Method: Peristaltic Pump

Sample Time: Start: 1030 Finish:

Sampling Method: Low Flow

Sample Analysis: 1, 4 Dioxane & PFAS

DRAFT

Purge Data

Sample Time	Flow Rate (lpm/gpm)	Volume Purged (liters/gals.)	pH (std. Units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temperature (Cel.)	Salinity (%)	ORP (mV)	Comments/Observations
1000	0.4	Initial	6.58	7.76	157	0.39	21.23	4.3	-35	Well Headspace PID =
1005		2	6.57	7.83	17.4	0.00	21.45	4.3	-36	
1010		4	6.56	7.87	2.6	0.00	21.62	4.4	-38	colorless w/ Sediment
1015		6	6.57	7.91	0.0	0.00	21.74	4.4	-43	No ODOR
1020		8	6.59	7.88	0.0	0.00	21.72	4.3	-48	
1025		10	6.59	7.85	0.0	0.00	21.68	4.3	-51	

Appendix B

Laboratory Data Usability Summary Report (Electronic Only)

DRAFT

Site: Long Island Emerging Contaminants, Bayridge
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166671
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-112	460-166671-01	PFAS, 1,4-Dioxane
MW-105	460-166671-02	PFAS, 1,4-Dioxane
DUP-101018	460-166671-03	PFAS, 1,4-Dioxane
FB-101018	460-166671-04	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-101018
Field Duplicate pair: MW-105/DUP-101018

The above-listed aqueous samples and field blank sample were collected on October 10, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

DRAFT

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

1,4-Dioxane and PFAS

Analytes were detected in the associated laboratory method and field blank samples. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane				
1,4-Dioxane	FB-101018: All samples	0.12 ug/L	1.2 ug/L	Qualify the results for 1,4-dioxane in samples MW-112, MW-105, and DUP-101018 as nondetect (U) at the RL.
PFAS				
Perfluoroundecanoic acid (PFUnA)	Method MB 200-135487: All samples	0.319 ng/L	3.19 ng/L	Qualify the results for Perfluoroundecanoic acid (PFUnA) in samples MW-112, MW-105, and DUP-101018, and FB-101018 as nondetect (U) at the RL.
Perfluorobutanoic acid (PFBA)	FB-101018: All samples	0.96 ng/L	9.6 ng/L	Validation actions were not required.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

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Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-112	13C4 PFBA	16	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample MW-112.
	M2-6:2 FTS	351		
	M2-8:2 FTS	190		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
MW-105	M2-6:2 FTS	266	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-105.
DUP-101018	M2-6:2 FTS	261	25-150	Estimate (J) the positive result for 6:2 FTS in sample DUP-101018.
FB-101018	M2-6:2 FTS	153	25-150	Validation action was not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-105 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples MW-105 and DUP-101018 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-105 (ng/L)	DUP-101018 (ng/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	11.5	11.7	1.7
Perfluoropentanoic (PFPeA)	12.0	11.9	0.8
Perfluorohexanoic acid (PFHxA)	12.8	12.8	0
Perfluoroheptanoic acid (PFHpA)	15.6	14.3	8.7

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Analyte	MW-105 (ng/L)	DUP-101018 (ng/L)	RPD (%)
Perfluorooctanoic acid (PFOA)	43.4	41.6	4.2
Perfluorononanoic acid (PFNA)	1.27 J	1.13 J	11.7
Perfluorobutanesulfonic acid (PFBS)	4.09	5.24	24.7
Perfluorohexanesulfonic acid(PFHxS)	2.38	2.88	19.0
Perfluorooctanesulfonic acid (PFOS)	6.70	6.95	3.7
6:2 FTS	7.15 J	6.82 J	4.7
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
MW-112	A 2-fold dilution was performed for Perfluorohexanesulfonic acid (PFHxS) due to sample matrix. All other results were reported from the undiluted analysis.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: MW-112
Date Collected: 10/10/18 12:25
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.15~~	~~J~~ 0.20U *	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 19:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*34*		*10 - 150*	*10/13/18 10:08*	*10/13/18 19:19*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**100**	J.	1.62	0.33	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluoropentanoic acid (PFPeA)	**16.6**		1.62	0.61	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorohexanoic acid (PFHxA)	**28.3**		1.62	0.19	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluoroheptanoic acid (PFHpA)	**16.8**		1.62	0.26	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorooctanoic acid (PFOA)	**53.9**		1.62	0.26	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorononanoic acid (PFNA)	**0.89**	J.	1.62	0.31	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorodecanoic acid (PFDA)	1.62	U	1.62	0.31	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluoroundecanoic acid (PFUnA)	~~0.40~~	~~J B~~ 1.62U *	1.62	0.20	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorododecanoic acid (PFDoA)	1.62	U	1.62	0.28	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorotridecanoic acid (PFTriA)	1.62	U	1.62	0.19	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorotetradecanoic acid (PFTeA)	1.62	U	1.62	0.36	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorobutanesulfonic acid (PFBS)	**4.09**		1.62	0.36	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorohexanesulfonic acid (PFHxS)	**6.06**		3.24	0.42	ng/L		10/19/18 11:40	10/22/18 18:51	2
Perfluoroheptanesulfonic Acid (PFHpS)	1.62	U	1.62	0.66	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorooctanesulfonic acid (PFOS)	**2.56**		1.62	0.62	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorodecanesulfonic acid (PFDS)	1.62	U	1.62	0.43	ng/L		10/19/18 11:40	10/21/18 22:21	1
Perfluorooctanesulfonamide (FOSA)	1.62	U	1.62	0.45	ng/L		10/19/18 11:40	10/21/18 22:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.2	U	16.2	0.36	ng/L		10/19/18 11:40	10/21/18 22:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2	U	16.2	0.57	ng/L		10/19/18 11:40	10/21/18 22:21	1
6:2 FTS	**9.50**	J *	16.2	0.81	ng/L		10/19/18 11:40	10/21/18 22:21	1
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/19/18 11:40	10/21/18 22:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*16*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C5-PFPeA DNU	*28*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C2 PFHxA	*41*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C4 PFHpA	*60*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C4 PFOA	*93*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C5 PFNA	*100*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C2 PFDA	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C2 PFUnA	*96*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C2 PFDoA	*97*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C2 PFTeDA	*101*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C3 PFBS	*58*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
18O2 PFHxS	*83*		*25 - 150*	*10/19/18 11:40*	*10/22/18 18:51*	*2*
13C4 PFOS	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
13C8 FOSA	*40*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
d3-NMeFOSAA	*75*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:21*	*1*

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AM 11/3/18

Client Sample ID: MW-112

Date Collected: 10/10/18 12:25
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	351	*	25 - 150	10/19/18 11:40	10/21/18 22:21	1
M2-8:2 FTS	190	*	25 - 150	10/19/18 11:40	10/21/18 22:21	1

Client Sample ID: MW-105

Date Collected: 10/10/18 10:00
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.11~~ ~~J~~ 0.20 U	*	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 19:02	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	38		10 - 150	10/13/18 10:08	10/13/18 19:02	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	11.5		1.83	0.37	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluoropentanoic acid (PFPeA)	12.0		1.83	0.68	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorohexanoic acid (PFHxA)	12.8		1.83	0.22	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluoroheptanoic acid (PFHpA)	15.6		1.83	0.29	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorooctanoic acid (PFOA)	43.4		1.83	0.29	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorononanoic acid (PFNA)	1.27	J	1.83	0.35	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorodecanoic acid (PFDA)	1.83	U	1.83	0.35	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluoroundecanoic acid (PFUnA)	~~0.36~~ ~~J B~~ 1.83 U		1.83	0.23	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorododecanoic acid (PFDoA)	1.83	U	1.83	0.32	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorotridecanoic acid (PFTriA)	1.83	U	1.83	0.22	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorotetradecanoic acid (PFTeA)	1.83	U	1.83	0.41	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorobutanesulfonic acid (PFBS)	4.09		1.83	0.40	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorohexanesulfonic acid (PFHxS)	2.38		1.83	0.24	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.83	U	1.83	0.75	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorooctanesulfonic acid (PFOS)	6.70		1.83	0.69	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorodecanesulfonic acid (PFDS)	1.83	U	1.83	0.48	ng/L		10/19/18 11:40	10/21/18 22:37	1
Perfluorooctanesulfonamide (FOSA)	1.83	U	1.83	0.51	ng/L		10/19/18 11:40	10/21/18 22:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.3	U	18.3	0.41	ng/L		10/19/18 11:40	10/21/18 22:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	18.3	U	18.3	0.64	ng/L		10/19/18 11:40	10/21/18 22:37	1
6:2 FTS	7.15	J	18.3	0.91	ng/L		10/19/18 11:40	10/21/18 22:37	1
8:2 FTS	18.3	U	18.3	0.51	ng/L		10/19/18 11:40	10/21/18 22:37	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	32		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C5-PFPeA DNU	60		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C2 PFHxA	66		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C4 PFHpA	78		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C4 PFOA	92		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C5 PFNA	100		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C2 PFDA	106		25 - 150	10/19/18 11:40	10/21/18 22:37	1

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Client Sample ID: MW-105

Date Collected: 10/10/18 10:00
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	112		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C2 PFDoA	128		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C2 PFTeDA	113		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C3 PFBS	73		25 - 150	10/19/18 11:40	10/21/18 22:37	1
18O2 PFHxS	95		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C4 PFOS	104		25 - 150	10/19/18 11:40	10/21/18 22:37	1
13C8 FOSA	54		25 - 150	10/19/18 11:40	10/21/18 22:37	1
d3-NMeFOSAA	85		25 - 150	10/19/18 11:40	10/21/18 22:37	1
d5-NEtFOSAA	99		25 - 150	10/19/18 11:40	10/21/18 22:37	1
M2-6:2 FTS	266	*	25 - 150	10/19/18 11:40	10/21/18 22:37	1
M2-8:2 FTS	113		25 - 150	10/19/18 11:40	10/21/18 22:37	1

Client Sample ID: DUP-101018

Date Collected: 10/10/18 00:00
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.11~~	~~J~~ 0.20 U	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 19:54	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	33		10 - 150	10/13/18 10:08	10/13/18 19:54	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**11.7**		1.69	0.35	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluoropentanoic acid (PFPeA)	**11.9**		1.69	0.63	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorohexanoic acid (PFHxA)	**12.8**		1.69	0.20	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluoroheptanoic acid (PFHpA)	**14.3**		1.69	0.27	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorooctanoic acid (PFOA)	**41.6**		1.69	0.27	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorononanoic acid (PFNA)	**1.13**	J	1.69	0.32	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorodecanoic acid (PFDA)	1.69	U	1.69	0.32	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluoroundecanoic acid (PFUnA)	~~0.30~~	~~J B~~ 1.69 U	1.69	0.21	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorododecanoic acid (PFDoA)	1.69	U	1.69	0.30	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorotridecanoic acid (PFTriA)	1.69	U	1.69	0.20	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorotetradecanoic acid (PFTeA)	1.69	U	1.69	0.38	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorobutanesulfonic acid (PFBS)	**5.24**		1.69	0.37	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorohexanesulfonic acid (PFHxS)	**2.88**		1.69	0.22	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.69	U	1.69	0.69	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorooctanesulfonic acid (PFOS)	**6.95**		1.69	0.64	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorodecanesulfonic acid (PFDS)	1.69	U	1.69	0.45	ng/L		10/19/18 11:40	10/21/18 23:41	1
Perfluorooctanesulfonamide (FOSA)	1.69	U	1.69	0.47	ng/L		10/19/18 11:40	10/21/18 23:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.9	U	16.9	0.38	ng/L		10/19/18 11:40	10/21/18 23:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.9	U	16.9	0.59	ng/L		10/19/18 11:40	10/21/18 23:41	1
6:2 FTS	**6.82**	J	16.9	0.84	ng/L		10/19/18 11:40	10/21/18 23:41	1

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Client Sample ID: DUP-101018

Date Collected: 10/10/18 00:00
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
8:2 FTS	16.9	U	16.9	0.47	ng/L		10/19/18 11:40	10/21/18 23:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*37*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C5-PFPeA DNU	*62*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C2 PFHxA	*67*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C4 PFHpA	*83*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C4 PFOA	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C5 PFNA	*103*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C2 PFDA	*100*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C2 PFUnA	*100*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C2 PFDoA	*111*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C2 PFTeDA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
18O2 PFHxS	*98*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C4 PFOS	*101*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
13C8 FOSA	*63*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
d3-NMeFOSAA	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
d5-NEtFOSAA	*93*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
M2-6:2 FTS	*261*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*
M2-8:2 FTS	*107*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:41*	*1*

Client Sample ID: FB-101018

Date Collected: 10/10/18 09:05
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.12	J	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 20:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*39*		*10 - 150*	*10/13/18 10:08*	*10/13/18 20:11*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.96**	J	1.66	0.34	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluoropentanoic acid (PFPeA)	1.66	U	1.66	0.62	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorohexanoic acid (PFHxA)	1.66	U	1.66	0.20	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluoroheptanoic acid (PFHpA)	1.66	U	1.66	0.27	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorooctanoic acid (PFOA)	1.66	U	1.66	0.27	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorononanoic acid (PFNA)	1.66	U	1.66	0.32	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorodecanoic acid (PFDA)	1.66	U	1.66	0.32	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluoroundecanoic acid (PFUnA)	~~0.26~~	~~J B~~ 1.66U	1.66	0.21	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorododecanoic acid (PFDoA)	1.66	U	1.66	0.29	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorotridecanoic acid (PFTriA)	1.66	U	1.66	0.20	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorotetradecanoic acid (PFTeA)	1.66	U	1.66	0.37	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorobutanesulfonic acid (PFBS)	1.66	U	1.66	0.37	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorohexanesulfonic acid (PFHxS)	1.66	U	1.66	0.22	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.66	U	1.66	0.68	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorooctanesulfonic acid (PFOS)	1.66	U	1.66	0.63	ng/L		10/19/18 11:40	10/21/18 23:56	1

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Client Sample ID: FB-101018
Date Collected: 10/10/18 09:05
Date Received: 10/11/18 19:30

Lab Sample ID: 460-166671-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	1.66	U	1.66	0.44	ng/L		10/19/18 11:40	10/21/18 23:56	1
Perfluorooctanesulfonamide (FOSA)	1.66	U	1.66	0.47	ng/L		10/19/18 11:40	10/21/18 23:56	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.6	U	16.6	0.37	ng/L		10/19/18 11:40	10/21/18 23:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.6	U	16.6	0.58	ng/L		10/19/18 11:40	10/21/18 23:56	1
6:2 FTS	16.6	U	16.6	0.83	ng/L		10/19/18 11:40	10/21/18 23:56	1
8:2 FTS	16.6	U	16.6	0.47	ng/L		10/19/18 11:40	10/21/18 23:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*84*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C5-PFPeA DNU	*112*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C2 PFHxA	*111*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C4 PFHpA	*92*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C4 PFOA	*98*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C2 PFDA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C2 PFUnA	*97*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C2 PFDoA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C2 PFTeDA	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C3 PFBS	*99*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
18O2 PFHxS	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C4 PFOS	*100*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
13C8 FOSA	*63*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
d5-NEtFOSAA	*90*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
M2-6:2 FTS	*153*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*
M2-8:2 FTS	*82*		*25 - 150*	*10/19/18 11:40*	*10/21/18 23:56*	*1*

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 166671
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:		Analysis Requested	
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033	PO #: 1803556-1.18			
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	WO #:			
Email: mfelter@geiconsultants.com	Project #: 46027288			
Project Name: Emerging Contaminants - Long Island/NYC	SSOW#:			
Site/Project Description: Bay Ridge-PFAS-1803556-1.18				

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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N			
MW-112	10/10/18	1225	G	Water	N	X	X	4	1
MW-105	10/10/18	1000	G	Water	N	X	X	12	MS/MSD 2
DUP-101018	10/10/18	—	G	Water	N	N	X	4	3
FB-101018	10/10/18	0905	G	Water	N	N	X	4	1

SUB Work

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Preservation Codes:

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

Other:

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) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

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

	Date/Time	Company		Date/Time	Company
Relinquished by:	10/11/18 1205	GEI	Received by:	10/11/18 1205	TA
Relinquished by:	10/11/18 1640	TA	Received by:	10/11/18 17:20	TA
Relinquished by:	10/11/18 17:20	TA	Received by:	10/11/18 1920	TA DC

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

3 / 3.5 / RCT

Ver: 08/04/2016

460-166671 Chain of Custody Page 342 of 347

Site: Long Island Emerging Contaminants, Bayshore
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165435
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
BB-MW-41I	460-165435-01	PFAS, 1,4-Dioxane
MW-29S	460-165435-02	PFAS, 1,4-Dioxane
MW-09I	460-165435-03	PFAS, 1,4-Dioxane
OU2-MW-57I	460-165435-04	PFAS, 1,4-Dioxane
OU3-MW-11S	460-165435-05	PFAS, 1,4-Dioxane
MW-XX-092418	460-165435-06	PFAS, 1,4-Dioxane
Fieldblank-092418	460-165435-07	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: Fieldblank-092418
Field Duplicate pair: MW-29S/MW-XX-092418

The above-listed aqueous samples and field blank sample were collected on September 24, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

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In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were not detected in the associated field blank sample. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorohexanesulfonic acid (PFHxS)	Method MB 200-134717: All samples	0.348 ng/L	3.48 ng/L	Qualify the result for PFHxS in samples MW-29S, OU3-MW-11S, and MW-XX-092418 as nondetect (U) at the RL. Qualify the result for PFHxS in sample BB-MW-41I as estimated (J); High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

DRAFT

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
BB-MW-41I	M2-6:2 FTS	156	25-150	Validation action was not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.
MW-29S	13C4 PFBA	24	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample MW-29S.
	M2-6:2 FTS	233		
	M2-8:2 FTS	190		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
OU2-MW-57I	d3-NMeFOSAA	152	25-150	Validation action was not required as the results for NMeFOSAA, NEtFOSAA, 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	d5-NEtFOSAA	154		
	M2-6:2 FTS	258		
	M2-8:2 FTS	232		
OU3-MW-11S	13C4 PFBA	19	24-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA), Perfluoroundecanoic acid (PFUnA), and 6:2 FTS in sample OU3-MW-11S.
	13C2 PFUnA	154		
	M2-6:2 FTS	319		
	d3-NMeFOSAA	163	25-150	Validation action was not required as the results for NMeFOSAA, NEtFOSAA, and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	d5-NEtFOSAA	181		
	M2-8:2 FTS	298		
MW-XX-092418	13C4 PFBA	24	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample MW-XX-092418.
	M2-6:2 FTS	220		
	M2-8:2 FTS	189		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample BB-MW-41I for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

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Field Duplicate Results

Samples MW-29S and MW-XX-092418 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-29S (ug/L)	MW-XX-092418 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	12.8	12.8	0
Perfluoropentanoic (PFPeA)	2.80	4.23	40.7, Within the RL
Perfluorohexanoic acid (PFHxA)	3.81	3.36	12.6
Perfluoroheptanoic acid (PFHpA)	4.20	4.00	4.9
Perfluorooctanoic acid (PFOA)	17.0	18.7	9.5
Perfluorononanoic acid (PFNA)	1.41 J	1.46 J	3.5
Perfluorobutanesulfonic acid (PFBS)	2.41	2.22	8.2
Perfluorooctanesulfonic acid (PFOS)	5.99	6.44	7.2
6:2 FTS	2.69 J	1.98 J	30.4, Within the RL
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Bayshore-PFAS-1803556-1.1

TestAmerica Job ID: 460-165435-1

Client Sample ID: BB-MW-41I
Date Collected: 09/24/18 12:05
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 14:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*37*		*10 - 150*	*09/27/18 08:42*	*09/27/18 14:53*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.20**		1.74	0.36	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluoropentanoic acid (PFPeA)	**4.59**		1.74	0.65	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorohexanoic acid (PFHxA)	**5.26**		1.74	0.21	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluoroheptanoic acid (PFHpA)	**5.27**		1.74	0.28	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorooctanoic acid (PFOA)	**18.4**		1.74	0.28	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorononanoic acid (PFNA)	**1.96**		1.74	0.33	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorodecanoic acid (PFDA)	1.74	U	1.74	0.33	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluoroundecanoic acid (PFUnA)	1.74	U	1.74	0.22	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorododecanoic acid (PFDoA)	1.74	U	1.74	0.30	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorotridecanoic acid (PFTriA)	1.74	U	1.74	0.21	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorotetradecanoic acid (PFTeA)	1.74	U	1.74	0.39	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorobutanesulfonic acid (PFBS)	**4.84**		1.74	0.38	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorohexanesulfonic acid (PFHxS)	**2.64**	B J	1.74	0.23	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.74	U	1.74	0.71	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorooctanesulfonic acid (PFOS)	**30.9**		1.74	0.66	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorodecanesulfonic acid (PFDS)	1.74	U	1.74	0.46	ng/L		10/02/18 09:07	10/03/18 14:19	1
Perfluorooctanesulfonamide (FOSA)	1.74	U	1.74	0.49	ng/L		10/02/18 09:07	10/03/18 14:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**0.47**	J	17.4	0.39	ng/L		10/02/18 09:07	10/03/18 14:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.4	U	17.4	0.61	ng/L		10/02/18 09:07	10/03/18 14:19	1
6:2 FTS	17.4	U	17.4	0.87	ng/L		10/02/18 09:07	10/03/18 14:19	1
8:2 FTS	17.4	U	17.4	0.49	ng/L		10/02/18 09:07	10/03/18 14:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*34*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C5 PFPeA	*66*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C2 PFHxA	*83*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C4 PFHpA	*89*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C4 PFOA	*107*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C5 PFNA	*107*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C2 PFDA	*103*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C2 PFUnA	*104*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C2 PFDoA	*87*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C2 PFTeDA	*87*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C3 PFBS	*88*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
18O2 PFHxS	*117*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C4 PFOS	*120*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
13C8 FOSA	*104*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
d3-NMeFOSAA	*124*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*
d5-NEtFOSAA	*123*		*25 - 150*	*10/02/18 09:07*	*10/03/18 14:19*	*1*

DRAFT

Client Sample ID: BB-MW-41I

Date Collected: 09/24/18 12:05
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	156	*	25 - 150	10/02/18 09:07	10/03/18 14:19	1
M2-8:2 FTS	145		25 - 150	10/02/18 09:07	10/03/18 14:19	1

Client Sample ID: MW-29S

Date Collected: 09/24/18 14:25
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 15:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	41		10 - 150	09/27/18 08:42	09/27/18 15:10	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**12.8**	J.	1.85	0.38	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluoropentanoic acid (PFPeA)	**2.80**		1.85	0.69	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorohexanoic acid (PFHxA)	**3.81**		1.85	0.22	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluoroheptanoic acid (PFHpA)	**4.20**		1.85	0.30	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorooctanoic acid (PFOA)	**17.0**		1.85	0.30	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorononanoic acid (PFNA)	**1.41**	J.	1.85	0.35	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorodecanoic acid (PFDA)	1.85	U	1.85	0.35	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluoroundecanoic acid (PFUnA)	1.85	U	1.85	0.23	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorododecanoic acid (PFDoA)	1.85	U	1.85	0.32	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorotridecanoic acid (PFTriA)	1.85	U	1.85	0.22	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorotetradecanoic acid (PFTeA)	1.85	U	1.85	0.42	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorobutanesulfonic acid (PFBS)	**2.41**		1.85	0.41	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.50~~ ~~J B~~ 1.85 U.		1.85	0.24	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.85	U	1.85	0.76	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorooctanesulfonic acid (PFOS)	**5.99**		1.85	0.70	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorodecanesulfonic acid (PFDS)	1.85	U	1.85	0.49	ng/L		10/02/18 09:07	10/03/18 15:07	1
Perfluorooctanesulfonamide (FOSA)	1.85	U	1.85	0.52	ng/L		10/02/18 09:07	10/03/18 15:07	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.5	U	18.5	0.42	ng/L		10/02/18 09:07	10/03/18 15:07	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	18.5	U	18.5	0.65	ng/L		10/02/18 09:07	10/03/18 15:07	1
6:2 FTS	**2.69**	J.	18.5	0.93	ng/L		10/02/18 09:07	10/03/18 15:07	1
8:2 FTS	18.5	U	18.5	0.52	ng/L		10/02/18 09:07	10/03/18 15:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	24	*	25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C5 PFPeA	46		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C2 PFHxA	73		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C4 PFHpA	89		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C4 PFOA	111		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C5 PFNA	124		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C2 PFDA	122		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C2 PFUnA	128		25 - 150	10/02/18 09:07	10/03/18 15:07	1

DRAFT

Client Sample ID: MW-29S

Date Collected: 09/24/18 14:25
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	115		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C2 PFTeDA	100		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C3 PFBS	58		25 - 150	10/02/18 09:07	10/03/18 15:07	1
18O2 PFHxS	110		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C4 PFOS	128		25 - 150	10/02/18 09:07	10/03/18 15:07	1
13C8 FOSA	113		25 - 150	10/02/18 09:07	10/03/18 15:07	1
d3-NMeFOSAA	141		25 - 150	10/02/18 09:07	10/03/18 15:07	1
d5-NEtFOSAA	148		25 - 150	10/02/18 09:07	10/03/18 15:07	1
M2-6:2 FTS	233	*	25 - 150	10/02/18 09:07	10/03/18 15:07	1
M2-8:2 FTS	190	*	25 - 150	10/02/18 09:07	10/03/18 15:07	1

Client Sample ID: MW-09I

Date Collected: 09/24/18 15:05
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 15:27	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	38		10 - 150	09/27/18 08:42	09/27/18 15:27	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.09**		1.71	0.35	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluoropentanoic acid (PFPeA)	**4.43**		1.71	0.64	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorohexanoic acid (PFHxA)	**5.04**		1.71	0.21	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluoroheptanoic acid (PFHpA)	**4.70**		1.71	0.27	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorooctanoic acid (PFOA)	**14.8**		1.71	0.27	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorononanoic acid (PFNA)	**1.27**	J	1.71	0.32	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorodecanoic acid (PFDA)	1.71	U	1.71	0.32	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluoroundecanoic acid (PFUnA)	1.71	U	1.71	0.21	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorododecanoic acid (PFDoA)	1.71	U	1.71	0.30	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorotridecanoic acid (PFTriA)	1.71	U	1.71	0.21	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorotetradecanoic acid (PFTeA)	1.71	U	1.71	0.38	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorobutanesulfonic acid (PFBS)	**4.39**		1.71	0.38	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorohexanesulfonic acid (PFHxS)	**5.30**	B	1.71	0.22	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.71	U	1.71	0.70	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorooctanesulfonic acid (PFOS)	**13.6**		1.71	0.65	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorodecanesulfonic acid (PFDS)	1.71	U	1.71	0.45	ng/L		10/02/18 09:07	10/03/18 15:23	1
Perfluorooctanesulfonamide (FOSA)	1.71	U	1.71	0.48	ng/L		10/02/18 09:07	10/03/18 15:23	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.1	U	17.1	0.38	ng/L		10/02/18 09:07	10/03/18 15:23	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.1	U	17.1	0.60	ng/L		10/02/18 09:07	10/03/18 15:23	1
6:2 FTS	17.1	U	17.1	0.85	ng/L		10/02/18 09:07	10/03/18 15:23	1
8:2 FTS	17.1	U	17.1	0.48	ng/L		10/02/18 09:07	10/03/18 15:23	1

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Client Sample ID: MW-09I
Date Collected: 09/24/18 15:05
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	49		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C5 PFPeA	75		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C2 PFHxA	98		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C4 PFHpA	98		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C4 PFOA	103		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C5 PFNA	106		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C2 PFDA	108		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C2 PFUnA	114		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C2 PFDoA	98		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C2 PFTeDA	90		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C3 PFBS	97		25 - 150	10/02/18 09:07	10/03/18 15:23	1
18O2 PFHxS	113		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C4 PFOS	120		25 - 150	10/02/18 09:07	10/03/18 15:23	1
13C8 FOSA	100		25 - 150	10/02/18 09:07	10/03/18 15:23	1
d3-NMeFOSAA	120		25 - 150	10/02/18 09:07	10/03/18 15:23	1
d5-NEtFOSAA	139		25 - 150	10/02/18 09:07	10/03/18 15:23	1
M2-6:2 FTS	140		25 - 150	10/02/18 09:07	10/03/18 15:23	1
M2-8:2 FTS	139		25 - 150	10/02/18 09:07	10/03/18 15:23	1

Client Sample ID: OU2-MW-57I
Date Collected: 09/24/18 16:05
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 15:45	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	40		10 - 150	09/27/18 08:42	09/27/18 15:45	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**30.9**		1.79	0.37	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluoropentanoic acid (PFPeA)	**8.56**		1.79	0.67	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorohexanoic acid (PFHxA)	**4.15**		1.79	0.21	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluoroheptanoic acid (PFHpA)	**4.86**		1.79	0.29	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorooctanoic acid (PFOA)	**15.0**		1.79	0.29	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorononanoic acid (PFNA)	**1.54**	J	1.79	0.34	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorodecanoic acid (PFDA)	**0.46**	J	1.79	0.34	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluoroundecanoic acid (PFUnA)	**0.53**	J	1.79	0.22	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorododecanoic acid (PFDoA)	1.79	U	1.79	0.31	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorotridecanoic acid (PFTriA)	1.79	U	1.79	0.21	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorotetradecanoic acid (PFTeA)	1.79	U	1.79	0.40	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorobutanesulfonic acid (PFBS)	**4.61**		1.79	0.39	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorohexanesulfonic acid (PFHxS)	**8.17**	B	1.79	0.23	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.79	U	1.79	0.73	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorooctanesulfonic acid (PFOS)	**26.2**		1.79	0.68	ng/L		10/02/18 09:07	10/03/18 15:39	1
Perfluorodecanesulfonic acid (PFDS)	1.79	U	1.79	0.47	ng/L		10/02/18 09:07	10/03/18 15:39	1

DRAFT

Client Sample ID: OU2-MW-57I

Date Collected: 09/24/18 16:05
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (FOSA)	1.79	U	1.79	0.50	ng/L		10/02/18 09:07	10/03/18 15:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.9	U	17.9	0.40	ng/L		10/02/18 09:07	10/03/18 15:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.9	U	17.9	0.63	ng/L		10/02/18 09:07	10/03/18 15:39	1
6:2 FTS	17.9	U	17.9	0.89	ng/L		10/02/18 09:07	10/03/18 15:39	1
8:2 FTS	17.9	U	17.9	0.50	ng/L		10/02/18 09:07	10/03/18 15:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*29*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C5 PFPeA	*50*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C2 PFHxA	*78*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C4 PFHpA	*87*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C4 PFOA	*115*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C5 PFNA	*134*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C2 PFDA	*125*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C2 PFUnA	*128*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C2 PFDoA	*103*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C3 PFBS	*79*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
18O2 PFHxS	*104*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C4 PFOS	*118*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
13C8 FOSA	*105*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
d3-NMeFOSAA	*152*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
d5-NEtFOSAA	*154*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
M2-6:2 FTS	*258*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*
M2-8:2 FTS	*232*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:39*	*1*

Client Sample ID: OU3-MW-11S

Date Collected: 09/24/18 17:20
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 16:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*35*		*10 - 150*	*09/27/18 08:42*	*09/27/18 16:02*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**23.2**	J	1.81	0.37	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluoropentanoic acid (PFPeA)	**4.30**		1.81	0.68	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorohexanoic acid (PFHxA)	**7.68**		1.81	0.22	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluoroheptanoic acid (PFHpA)	**4.99**		1.81	0.29	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorooctanoic acid (PFOA)	**13.2**		1.81	0.29	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorononanoic acid (PFNA)	**3.11**		1.81	0.34	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorodecanoic acid (PFDA)	**1.91**		1.81	0.34	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluoroundecanoic acid (PFUnA)	**1.02**	J	1.81	0.23	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorododecanoic acid (PFDoA)	1.81	U	1.81	0.32	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorotridecanoic acid (PFTriA)	1.81	U	1.81	0.22	ng/L		10/02/18 09:07	10/03/18 15:55	1

DRAFT

Client Sample ID: OU3-MW-11S

Date Collected: 09/24/18 17:20
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	1.81	U	1.81	0.41	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorobutanesulfonic acid (PFBS)	**5.48**		1.81	0.40	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.67 J B~~ 1.81 U		1.81	0.24	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.81	U	1.81	0.74	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorooctanesulfonic acid (PFOS)	**18.7**		1.81	0.69	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorodecanesulfonic acid (PFDS)	**0.91**	J	1.81	0.48	ng/L		10/02/18 09:07	10/03/18 15:55	1
Perfluorooctanesulfonamide (FOSA)	1.81	U	1.81	0.51	ng/L		10/02/18 09:07	10/03/18 15:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.1	U	18.1	0.41	ng/L		10/02/18 09:07	10/03/18 15:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	18.1	U	18.1	0.63	ng/L		10/02/18 09:07	10/03/18 15:55	1
6:2 FTS	**1.46**	J	18.1	0.90	ng/L		10/02/18 09:07	10/03/18 15:55	1
8:2 FTS	18.1	U	18.1	0.51	ng/L		10/02/18 09:07	10/03/18 15:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*19*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C5 PFPeA	*43*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C2 PFHxA	*60*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C4 PFOA	*111*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C5 PFNA	*131*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C2 PFDA	*135*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C2 PFUnA	*154*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C2 PFDoA	*128*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C2 PFTeDA	*107*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C3 PFBS	*64*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
18O2 PFHxS	*106*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C4 PFOS	*144*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
13C8 FOSA	*111*		*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
d3-NMeFOSAA	*163*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
d5-NEtFOSAA	*181*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
M2-6:2 FTS	*319*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*
M2-8:2 FTS	*298*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 15:55*	*1*

Client Sample ID: MW-XX-092418

Date Collected: 09/24/18 14:00
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-6
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 16:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*38*		*10 - 150*	*09/27/18 08:42*	*09/27/18 16:19*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**12.8**	J	1.96	0.40	ng/L		10/02/18 09:07	10/03/18 16:26	1

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Client Sample ID: MW-XX-092418
Date Collected: 09/24/18 14:00
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-6
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanoic acid (PFPeA)	**4.23**		1.96	0.73	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorohexanoic acid (PFHxA)	**3.36**		1.96	0.23	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluoroheptanoic acid (PFHpA)	**4.00**		1.96	0.31	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorooctanoic acid (PFOA)	**18.7**		1.96	0.31	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorononanoic acid (PFNA)	**1.46**	J ·	1.96	0.37	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorodecanoic acid (PFDA)	1.96	U	1.96	0.37	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluoroundecanoic acid (PFUnA)	1.96	U	1.96	0.24	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorododecanoic acid (PFDoA)	1.96	U	1.96	0.34	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorotridecanoic acid (PFTriA)	1.96	U	1.96	0.23	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorotetradecanoic acid (PFTeA)	1.96	U	1.96	0.44	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorobutanesulfonic acid (PFBS)	**2.22**		1.96	0.43	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.26~~ ~~J B~~	1.96 U ·	1.96	0.25	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.96	U	1.96	0.80	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorooctanesulfonic acid (PFOS)	**6.44**		1.96	0.74	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorodecanesulfonic acid (PFDS)	1.96	U	1.96	0.52	ng/L		10/02/18 09:07	10/03/18 16:26	1
Perfluorooctanesulfonamide (FOSA)	1.96	U	1.96	0.55	ng/L		10/02/18 09:07	10/03/18 16:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19.6	U	19.6	0.44	ng/L		10/02/18 09:07	10/03/18 16:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19.6	U	19.6	0.68	ng/L		10/02/18 09:07	10/03/18 16:26	1
6:2 FTS	**1.98**	J ·	19.6	0.98	ng/L		10/02/18 09:07	10/03/18 16:26	1
8:2 FTS	19.6	U	19.6	0.55	ng/L		10/02/18 09:07	10/03/18 16:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*24*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C5 PFPeA	*40*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C2 PFHxA	*73*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C4 PFHpA	*84*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C4 PFOA	*105*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C5 PFNA	*125*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C2 PFDA	*118*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C2 PFUnA	*127*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C2 PFDoA	*114*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C2 PFTeDA	*102*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C3 PFBS	*58*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
18O2 PFHxS	*108*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C4 PFOS	*131*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
13C8 FOSA	*110*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
d3-NMeFOSAA	*149*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
d5-NEtFOSAA	*149*		*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
M2-6:2 FTS	*220*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*
M2-8:2 FTS	*189*	*	*25 - 150*	*10/02/18 09:07*	*10/03/18 16:26*	*1*

DRAFT

Client Sample ID: Fieldblank-092418
Date Collected: 09/24/18 15:50
Date Received: 09/25/18 19:00

Lab Sample ID: 460-165435-7
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/27/18 08:42	09/27/18 16:37	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	39		10 - 150	09/27/18 08:42	09/27/18 16:37	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.04	U	2.04	0.42	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluoropentanoic acid (PFPeA)	2.04	U	2.04	0.76	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorohexanoic acid (PFHxA)	2.04	U	2.04	0.24	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluoroheptanoic acid (PFHpA)	2.04	U	2.04	0.33	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorooctanoic acid (PFOA)	2.04	U	2.04	0.33	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorononanoic acid (PFNA)	2.04	U	2.04	0.39	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorodecanoic acid (PFDA)	2.04	U	2.04	0.39	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluoroundecanoic acid (PFUnA)	2.04	U	2.04	0.25	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorododecanoic acid (PFDoA)	2.04	U	2.04	0.36	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorotridecanoic acid (PFTriA)	2.04	U	2.04	0.24	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorotetradecanoic acid (PFTeA)	2.04	U	2.04	0.46	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorobutanesulfonic acid (PFBS)	2.04	U	2.04	0.45	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorohexanesulfonic acid (PFHxS)	2.04	U	2.04	0.26	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluoroheptanesulfonic Acid (PFHpS)	2.04	U	2.04	0.84	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorooctanesulfonic acid (PFOS)	2.04	U	2.04	0.77	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorodecanesulfonic acid (PFDS)	2.04	U	2.04	0.54	ng/L		10/02/18 09:07	10/03/18 16:42	1
Perfluorooctanesulfonamide (FOSA)	2.04	U	2.04	0.57	ng/L		10/02/18 09:07	10/03/18 16:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	20.4	U	20.4	0.46	ng/L		10/02/18 09:07	10/03/18 16:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	20.4	U	20.4	0.71	ng/L		10/02/18 09:07	10/03/18 16:42	1
6:2 FTS	20.4	U	20.4	1.02	ng/L		10/02/18 09:07	10/03/18 16:42	1
8:2 FTS	20.4	U	20.4	0.57	ng/L		10/02/18 09:07	10/03/18 16:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	50		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C5 PFPeA	96		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C2 PFHxA	118		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C4 PFHpA	101		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C4 PFOA	107		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C5 PFNA	109		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C2 PFDA	111		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C2 PFUnA	119		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C2 PFDoA	94		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C2 PFTeDA	85		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C3 PFBS	96		25 - 150	10/02/18 09:07	10/03/18 16:42	1
18O2 PFHxS	113		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C4 PFOS	117		25 - 150	10/02/18 09:07	10/03/18 16:42	1
13C8 FOSA	90		25 - 150	10/02/18 09:07	10/03/18 16:42	1
d3-NMeFOSAA	140		25 - 150	10/02/18 09:07	10/03/18 16:42	1
d5-NEtFOSAA	135		25 - 150	10/02/18 09:07	10/03/18 16:42	1
M2-6:2 FTS	101		25 - 150	10/02/18 09:07	10/03/18 16:42	1
M2-8:2 FTS	124		25 - 150	10/02/18 09:07	10/03/18 16:42	1

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777 New Durham Road
Edison, New Jersey 08817
Phone: (732) 549-3900 Fax: (732) 549-3679

NYSC
460501

CHAIN OF CUSTODY / ANALYSIS REQUEST

10/15/2018

Name (for report and invoice) Melissa Felter	Samplers Name (Printed) Craig Hayes / Zachary Fanroy
Company GEI Consultants, Inc.	P. O. # 1803556-1.1
Address 455 Winding Brook Dr.	Analysis Turnaround Time: Standard [X]
City Glastonbury State CT	Rush Charges Authorized For: 2 Week [ ] 1 Week [ ] Other [ ]
Phone 860 368 5300 Fax 860 808 9717	

Site/Project Identification: Emerging contaminants - Long Island/NYC
State (Location of site): NJ: [ ] NY: [X] Other
Regulatory Program: DKQP: [ ]

Sample Identification	Date	Time	Matrix	No. of Cont.	PFC PFAS Standard list (21 analytes)	8270D 1,4 Dioxane
BB-MW-41I *	9/24/18	1205	GW	12	X	X
MW-29S	9/24/18	1425	GW	4	X	X
MW-09I	9/24/18	1505	GW	4	X	X
OU2-MW-57I	9/24/18	1605	GW	4	X	X
OU3-MW-11S	9/24/18	1720	GW	4	X	X
MW-XX-092418	9/24/18	1400	GW	4	X	X
FieldBlank-092418	9/24/18	1550	GW	4	X	X

SUB Work

LAB USE ONLY
Project No:
Job No: 165435
Sample Numbers: 1 2 3 4 5 6 7

460-165435 Chain of Custody

Preservation Used: 1 = ICE, 2 = HCl, 3 = H_2SO_4, 4 = HNO_3, 5 = NaOH
6 = Other _____, 7 = Other _____
Soil:
Water:

* perform MS/MSD on BB-MW-41I

Special Instructions: Edison lab-log in both tests into one login and ship pkgs

Water Metals Filtered (Yes/No)? _____

Relinquished by	Company	Date / Time	Received by	Company
1) Mike Cannon	GEI	9/25/18 12:10	1)	T-A
Relinquished by 2)	Company T-A	Date / Time 9/25/18 19:08	Received by 2) Kelly J	Company TAEdi
Relinquished by 3)	Company	Date / Time	Received by 3)	Company
Relinquished by 4)	Company	Date / Time	Received by 4)	Company

Laboratory Certifications: New Jersey (12028), New York (11452), Pennsylvania (68-522), Connecticut (PH-0200), Rhode Island (132).
Massachusetts (M-NJ312), North Carolina (No. 578)

TAL - 0016 (0715)

3.4 / 3.4 3.7 / 3.7 ENV 4

DRAFT

Site: Long Island Emerging Contaminants, Clifton
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166243
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 6, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
RW-210I	460-166243-01	PFAS, 1,4-Dioxane
RW-202S	460-166243-02	PFAS, 1,4-Dioxane
RW-23S	460-166243-03	PFAS, 1,4-Dioxane
DUP-100218	460-166243-04	PFAS, 1,4-Dioxane
FB-100218	460-166243-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100218
Field Duplicate pair: RW-202S/DUP-100218

The above-listed aqueous samples and field blank sample were collected on October 2, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

DRAFT

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were not detected in the associated laboratory method blank samples and field blank sample.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
RW-210I	M2-6:2 FTS	255	25-150	Validation action was not required as 6:2 FTS was not detected in this sample and therefore not affected by the high recoveries.
RW-202S	M2-6:2 FTS	428	25-150	Validation action was not required as 6:2 FTS, 8:2 FTS, Perfluorodecanoic acid (PFDoA), and Perfluorotetradecanoic acid (PFTeA) were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	212		
	13C2 PFDoA	165		
	13C2 PFTeDA	156		
RW-23	M2-6:2 FTS	260	25-150	Validation action was not required as 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	155		
DUP-100218	M2-6:2 FTS	231	25-150	Validation action was not required as 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	194		
FB-100218	13C5-PFPeA	152	25-150	Validation action was not required as Perfluoropentanoic acid (PFPeA) and 6:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-6:2 FTS	258		

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on

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the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample RW-23 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples RW-202S and DUP-100218 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	RW-202S (ug/L)	DUP-100218 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	31.3	28.8	8.3
Perfluoropentanoic (PFPeA)	7.59	8.16	7.2
Perfluorohexanoic acid (PFHxA)	1.68 U	0.54 J	NC, Within the RL
Perfluoroheptanoic acid (PFHpA)	1.68 U	0.43 J	NC, Within the RL
Perfluorooctanoic acid (PFOA)	1.58 J	2.40	41.2, Within the RL
Perfluoroundecanoic acid (PFUnA)	1.68 U	0.27 J	NC, Within the RL
Perfluorobutanesulfonic acid (PFBS)	1.68 U	1.43 J	NC, Within the RL
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Dilutions were not required.

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Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: RW-210I
Date Collected: 10/02/18 15:40
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 07:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*45*		*10 - 150*	*10/08/18 18:48*	*10/09/18 07:23*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.77	U	1.77	0.36	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluoropentanoic acid (PFPeA)	1.77	U	1.77	0.66	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorohexanoic acid (PFHxA)	1.77	U	1.77	0.21	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluoroheptanoic acid (PFHpA)	1.77	U	1.77	0.28	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorooctanoic acid (PFOA)	1.77	U	1.77	0.28	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorononanoic acid (PFNA)	1.77	U	1.77	0.34	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorodecanoic acid (PFDA)	1.77	U	1.77	0.34	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluoroundecanoic acid (PFUnA)	**0.23**	**J**	1.77	0.22	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorododecanoic acid (PFDoA)	1.77	U	1.77	0.31	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorotridecanoic acid (PFTriA)	1.77	U	1.77	0.21	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorotetradecanoic acid (PFTeA)	1.77	U	1.77	0.40	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorobutanesulfonic acid (PFBS)	**0.39**	**J**	1.77	0.39	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorohexanesulfonic acid (PFHxS)	1.77	U	1.77	0.23	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.77	U	1.77	0.72	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorooctanesulfonic acid (PFOS)	1.77	U	1.77	0.67	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorodecanesulfonic acid (PFDS)	1.77	U	1.77	0.47	ng/L		10/11/18 09:45	10/17/18 18:06	1
Perfluorooctanesulfonamide (FOSA)	1.77	U	1.77	0.50	ng/L		10/11/18 09:45	10/17/18 18:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.7	U	17.7	0.40	ng/L		10/11/18 09:45	10/17/18 18:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.7	U	17.7	0.62	ng/L		10/11/18 09:45	10/17/18 18:06	1
6:2 FTS	17.7	U	17.7	0.88	ng/L		10/11/18 09:45	10/17/18 18:06	1
8:2 FTS	17.7	U	17.7	0.50	ng/L		10/11/18 09:45	10/17/18 18:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*73*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C5-PFPeA DNU	*105*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C2 PFHxA	*97*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C4 PFHpA	*101*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C4 PFOA	*102*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C5 PFNA	*117*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C2 PFDA	*106*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C2 PFUnA	*107*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C2 PFDoA	*96*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C2 PFTeDA	*104*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C3 PFBS	*97*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
18O2 PFHxS	*99*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C4 PFOS	*99*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
13C8 FOSA	*72*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*
M2-6:2 FTS	*255*	*	*25 - 150*	*10/11/18 09:45*	*10/17/18 18:06*	*1*

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Client Sample ID: RW-210I

Date Collected: 10/02/18 15:40
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-8:2 FTS	143		25 - 150	10/11/18 09:45	10/17/18 18:06	1

Client Sample ID: RW-202S

Date Collected: 10/02/18 13:00
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 07:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	48		10 - 150	10/08/18 18:48	10/09/18 07:40	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**31.3**		1.68	0.34	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluoropentanoic acid (PFPeA)	**7.59**		1.68	0.63	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorohexanoic acid (PFHxA)	1.68	U	1.68	0.20	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluoroheptanoic acid (PFHpA)	1.68	U	1.68	0.27	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorooctanoic acid (PFOA)	**1.58**	J	1.68	0.27	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorononanoic acid (PFNA)	1.68	U	1.68	0.32	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorodecanoic acid (PFDA)	1.68	U	1.68	0.32	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluoroundecanoic acid (PFUnA)	1.68	U	1.68	0.21	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorododecanoic acid (PFDoA)	1.68	U	1.68	0.29	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorotridecanoic acid (PFTriA)	1.68	U	1.68	0.20	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorotetradecanoic acid (PFTeA)	1.68	U	1.68	0.38	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorobutanesulfonic acid (PFBS)	1.68	U	1.68	0.37	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorohexanesulfonic acid (PFHxS)	1.68	U	1.68	0.22	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.68	U	1.68	0.69	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorooctanesulfonic acid (PFOS)	1.68	U	1.68	0.64	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorodecanesulfonic acid (PFDS)	1.68	U	1.68	0.44	ng/L		10/11/18 09:45	10/16/18 05:58	1
Perfluorooctanesulfonamide (FOSA)	1.68	U	1.68	0.47	ng/L		10/11/18 09:45	10/16/18 05:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.8	U	16.8	0.38	ng/L		10/11/18 09:45	10/16/18 05:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.8	U	16.8	0.59	ng/L		10/11/18 09:45	10/16/18 05:58	1
6:2 FTS	16.8	U	16.8	0.84	ng/L		10/11/18 09:45	10/16/18 05:58	1
8:2 FTS	16.8	U	16.8	0.47	ng/L		10/11/18 09:45	10/16/18 05:58	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	27		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C5-PFPeA DNU	68		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C2 PFHxA	77		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C4 PFHpA	89		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C4 PFOA	105		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C5 PFNA	141		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C2 PFDA	141		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C2 PFUnA	146		25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C2 PFDoA	165	*	25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C2 PFTeDA	156	*	25 - 150	10/11/18 09:45	10/16/18 05:58	1
13C3 PFBS	89		25 - 150	10/11/18 09:45	10/16/18 05:58	1

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Client Sample ID: RW-202S

Date Collected: 10/02/18 13:00
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	*108*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*
13C4 PFOS	*133*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*
13C8 FOSA	*99*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*
d3-NMeFOSAA	*125*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*
d5-NEtFOSAA	*132*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*
M2-6:2 FTS	*428*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*
M2-8:2 FTS	*212*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 05:58*	*1*

Client Sample ID: RW-23

Date Collected: 10/02/18 09:40
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 07:58	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	*46*		*10 - 150*	*10/08/18 18:48*	*10/09/18 07:58*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**15.3**		1.75	0.36	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluoropentanoic acid (PFPeA)	**19.0**		1.75	0.66	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorohexanoic acid (PFHxA)	**16.5**		1.75	0.21	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluoroheptanoic acid (PFHpA)	**17.3**		1.75	0.28	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorooctanoic acid (PFOA)	**95.7**		1.75	0.28	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorononanoic acid (PFNA)	**4.32**		1.75	0.33	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorodecanoic acid (PFDA)	**2.06**		1.75	0.33	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluoroundecanoic acid (PFUnA)	**0.27**	J	1.75	0.22	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorododecanoic acid (PFDoA)	1.75	U	1.75	0.31	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorotridecanoic acid (PFTriA)	1.75	U	1.75	0.21	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorotetradecanoic acid (PFTeA)	1.75	U	1.75	0.39	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorobutanesulfonic acid (PFBS)	**14.3**		1.75	0.39	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorohexanesulfonic acid (PFHxS)	**2.38**		1.75	0.23	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.75	U	1.75	0.72	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorooctanesulfonic acid (PFOS)	**21.3**		1.75	0.67	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorodecanesulfonic acid (PFDS)	1.75	U	1.75	0.46	ng/L		10/11/18 09:45	10/17/18 18:22	1
Perfluorooctanesulfonamide (FOSA)	1.75	U	1.75	0.49	ng/L		10/11/18 09:45	10/17/18 18:22	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.5	U	17.5	0.39	ng/L		10/11/18 09:45	10/17/18 18:22	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.5	U	17.5	0.61	ng/L		10/11/18 09:45	10/17/18 18:22	1
6:2 FTS	17.5	U	17.5	0.88	ng/L		10/11/18 09:45	10/17/18 18:22	1
8:2 FTS	17.5	U	17.5	0.49	ng/L		10/11/18 09:45	10/17/18 18:22	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	*36*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:22*	*1*
13C5-PFPeA DNU	*58*		*25 - 150*	*10/11/18 09:45*	*10/17/18 18:22*	*1*

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Client Sample ID: RW-23

Date Collected: 10/02/18 09:40
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	68		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C4 PFHpA	91		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C4 PFOA	105		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C5 PFNA	119		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C2 PFDA	116		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C2 PFUnA	119		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C2 PFDoA	118		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C2 PFTeDA	123		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C3 PFBS	76		25 - 150	10/11/18 09:45	10/17/18 18:22	1
18O2 PFHxS	104		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C4 PFOS	111		25 - 150	10/11/18 09:45	10/17/18 18:22	1
13C8 FOSA	73		25 - 150	10/11/18 09:45	10/17/18 18:22	1
d3-NMeFOSAA	96		25 - 150	10/11/18 09:45	10/17/18 18:22	1
d5-NEtFOSAA	107		25 - 150	10/11/18 09:45	10/17/18 18:22	1
M2-6:2 FTS	260	*	25 - 150	10/11/18 09:45	10/17/18 18:22	1
M2-8:2 FTS	155	*	25 - 150	10/11/18 09:45	10/17/18 18:22	1

Client Sample ID: DUP-100218

Date Collected: 10/02/18 00:00
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 08:15	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	48		10 - 150	10/08/18 18:48	10/09/18 08:15	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**28.8**		1.78	0.36	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluoropentanoic acid (PFPeA)	**8.16**		1.78	0.67	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorohexanoic acid (PFHxA)	**0.54**	J	1.78	0.21	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluoroheptanoic acid (PFHpA)	**0.43**	J	1.78	0.28	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorooctanoic acid (PFOA)	**2.40**		1.78	0.28	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorononanoic acid (PFNA)	1.78	U	1.78	0.34	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorodecanoic acid (PFDA)	1.78	U	1.78	0.34	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluoroundecanoic acid (PFUnA)	**0.27**	J	1.78	0.22	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorododecanoic acid (PFDoA)	1.78	U	1.78	0.31	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorotridecanoic acid (PFTriA)	1.78	U	1.78	0.21	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorotetradecanoic acid (PFTeA)	1.78	U	1.78	0.40	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorobutanesulfonic acid (PFBS)	**1.43**	J	1.78	0.39	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorohexanesulfonic acid (PFHxS)	1.78	U	1.78	0.23	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.78	U	1.78	0.73	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorooctanesulfonic acid (PFOS)	1.78	U	1.78	0.68	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorodecanesulfonic acid (PFDS)	1.78	U	1.78	0.47	ng/L		10/11/18 09:45	10/17/18 19:10	1
Perfluorooctanesulfonamide (FOSA)	1.78	U	1.78	0.50	ng/L		10/11/18 09:45	10/17/18 19:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.8	U	17.8	0.40	ng/L		10/11/18 09:45	10/17/18 19:10	1

DRAFT

Client Sample ID: DUP-100218

Date Collected: 10/02/18 00:00
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.8	U	17.8	0.62	ng/L		10/11/18 09:45	10/17/18 19:10	1
6:2 FTS	17.8	U	17.8	0.89	ng/L		10/11/18 09:45	10/17/18 19:10	1
8:2 FTS	17.8	U	17.8	0.50	ng/L		10/11/18 09:45	10/17/18 19:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*31*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C5-PFPeA DNU	*49*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C2 PFHxA	*62*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C4 PFHpA	*85*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C4 PFOA	*103*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C5 PFNA	*125*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C2 PFDA	*124*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C2 PFUnA	*136*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C2 PFDoA	*142*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C2 PFTeDA	*143*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C3 PFBS	*75*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C4 PFOS	*114*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
13C8 FOSA	*93*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
d3-NMeFOSAA	*110*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
d5-NEtFOSAA	*126*		*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
M2-6:2 FTS	*231*	*	*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*
M2-8:2 FTS	*194*	*	*25 - 150*	*10/11/18 09:45*	*10/17/18 19:10*	*1*

Client Sample ID: FB-100218

Date Collected: 10/02/18 09:50
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/08/18 18:48	10/09/18 08:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*45*		*10 - 150*	*10/08/18 18:48*	*10/09/18 08:32*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.70	U	1.70	0.35	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluoropentanoic acid (PFPeA)	1.70	U	1.70	0.64	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorohexanoic acid (PFHxA)	1.70	U	1.70	0.20	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluoroheptanoic acid (PFHpA)	1.70	U	1.70	0.27	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorooctanoic acid (PFOA)	1.70	U	1.70	0.27	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorononanoic acid (PFNA)	1.70	U	1.70	0.32	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorodecanoic acid (PFDA)	1.70	U	1.70	0.32	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluoroundecanoic acid (PFUnA)	1.70	U	1.70	0.21	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorododecanoic acid (PFDoA)	1.70	U	1.70	0.30	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorotridecanoic acid (PFTriA)	1.70	U	1.70	0.20	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorotetradecanoic acid (PFTeA)	1.70	U	1.70	0.38	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorobutanesulfonic acid (PFBS)	1.70	U	1.70	0.37	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorohexanesulfonic acid (PFHxS)	1.70	U	1.70	0.22	ng/L		10/11/18 09:45	10/16/18 05:42	1

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Client Sample ID: FB-100218
Date Collected: 10/02/18 09:50
Date Received: 10/03/18 18:40

Lab Sample ID: 460-166243-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanesulfonic Acid (PFHpS)	1.70	U	1.70	0.70	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorooctanesulfonic acid (PFOS)	1.70	U	1.70	0.64	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorodecanesulfonic acid (PFDS)	1.70	U	1.70	0.45	ng/L		10/11/18 09:45	10/16/18 05:42	1
Perfluorooctanesulfonamide (FOSA)	1.70	U	1.70	0.47	ng/L		10/11/18 09:45	10/16/18 05:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.0	U	17.0	0.38	ng/L		10/11/18 09:45	10/16/18 05:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.0	U	17.0	0.59	ng/L		10/11/18 09:45	10/16/18 05:42	1
6:2 FTS	17.0	U	17.0	0.85	ng/L		10/11/18 09:45	10/16/18 05:42	1
8:2 FTS	17.0	U	17.0	0.47	ng/L		10/11/18 09:45	10/16/18 05:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*95*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C5-PFPeA DNU	*152*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C2 PFHxA	*127*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C4 PFHpA	*100*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C4 PFOA	*107*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C5 PFNA	*118*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C2 PFDA	*109*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C2 PFUnA	*105*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C2 PFDoA	*106*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C2 PFTeDA	*102*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C3 PFBS	*124*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
18O2 PFHxS	*102*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C4 PFOS	*120*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
13C8 FOSA	*70*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
M2-6:2 FTS	*258*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*
M2-8:2 FTS	*115*		*25 - 150*	*10/11/18 09:45*	*10/16/18 05:42*	*1*

DRAFT

| Company: GEI Consultants, Inc. | | | | | Analysis Requested | | | | |

Site: Long Island Emerging Contaminants, Equity
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166801
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-6B	460-166801-01	PFAS, 1,4-Dioxane
MW-8B	460-166801-02	PFAS, 1,4-Dioxane
MW-11B	460-166801-03	PFAS, 1,4-Dioxane
DUP-100118-1*	460-166801-04	PFAS, 1,4-Dioxane
FB-100118*	460-166801-05	PFAS, 1,4-Dioxane

* Collection date 10/12/18

Associated QC Samples:
Field Blank: FB-100118-1
Field Duplicate pair: MW-8B/DUP-100118

The above-listed aqueous samples and field blank sample were collected on October 12, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

DRAFT

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

1,4-Dioxane and PFAS

Analytes were detected in the associated laboratory method and field blank samples. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane				
1,4-Dioxane	FB-100118-1: All samples	0.12 ug/L	1.2 ug/L	Qualify the results for 1,4-dioxane in samples MW-6B, MW-8B, MW-11B, and DUP-100118-1 as estimated (J); High bias.
PFAS				
Perfluoroundecanoic acid (PFUnA)	Method MB 200-135602: All samples	0.368 ng/L	3.68 ng/L	Qualify the results for PFUnA in samples MW-8B, MW-11B, DUP-100118-1, and FB-100118-1 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

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Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-6B	13C4 PFBA	16	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample MW-6B.
	M2-6:2 FTS	164		
MW-8B	13C4 PFBA	13	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA), Perfluoropentanoic acid (PFPeA), Perfluorohexanoic Acid (PFHxA), 6:2 FTS, and N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA) in sample MW-8B.
	13C5 PFPeA	18		
	13C2 PFHxA	24		
	M2-6:2 FTS	290		
	d5-NEtFOSAA	172		
	M2-8:2 FTS	281		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
MW-11B	13C4 PFBA	14	25-150	Estimate (J) the positive result for Perfluorobutanoic acid (PFBA) in sample MW-11B.
	M2-6:2 FTS	205		Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	194		
DUP-100118-1	13C4 PFBA	13	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA), Perfluoropentanoic acid (PFPeA), and N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA) in sample DUP-100118-1.
	13C5 PFPeA	20		
	M2-6:2 FTS	279		
	M2-8:2 FTS	269		Validation action was not required as the results for 8:2 FTS and NEtFOSAA were not detected in this sample and therefore not affected by the high recoveries.
	d5-NEtFOSAA	163		

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-6B for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

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Field Duplicate Results

Samples MW-8B and DUP-100118-1 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-8B (ng/L)	DUP-100118-1 (ng/L)	RPD (%)
1,4-Dioxane	0.43	0.53	20.8
Perfluorobutanoic acid (PFBA)	238	242	1.7
Perfluoropentanoic (PFPeA)	130	124	4.7
Perfluorohexanoic acid (PFHxA)	78.4	75.6	3.6
Perfluoroheptanoic acid (PFHpA)	54.0	45.8	16.4
Perfluorooctanoic acid (PFOA)	105	118	11.7
Perfluorononanoic acid (PFNA)	6.92	6.37	8.3
Perfluorodecanoic acid (PFDA)	1.47 J	1.22 J	18.6
Perfluorobutanesulfonic acid (PFBS)	9.03	11.5	24.1
Perfluorohexanesulfonic acid(PFHxS)	20.2	18.7	7.7
Perfluoroheptanesulfonic Acid (PFHpS)	0.97 J	0.86 J	12.0
Perfluorooctanesulfonic acid (PFOS)	41.6	42.2	1.4
Perfluorooctanesulfonamide (FOSA)	0.52 J	1.62 U	NC, Within the RL
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.75 J	16.2 U	NC, Within the RL
6:2 FTS	3.97 J	4.10 J	3.2
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
MW-8B	A 10-fold dilution was performed for Perfluoroheptanoic acid (PFHpA), Perfluorooctanoic acid (PFOA), and Perfluorohexanesulfonic acid (PFHxS) to reduce sample matrix effect. All other results were reported from the undiluted analysis.
MW-11B	A 5-fold dilution was performed for Perfluoroheptanoic acid (PFHpA), Perfluorooctanoic acid (PFOA), and Perfluorohexanesulfonic acid (PFHxS) to reduce sample matrix effect. All other results were reported from the undiluted analysis.

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Sample	PFAS Analysis Reported
DUP-100118-1	A 10-fold dilution was performed for Perfluoroheptanoic acid (PFHpA), Perfluorooctanoic acid (PFOA), and Perfluorohexanesulfonic acid (PFHxS) to reduce sample matrix effect. All other results were reported from the undiluted analysis.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample ID: MW-6B
Date Collected: 10/12/18 08:10
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.73	J	0.20	0.016	ug/L		10/14/18 09:11	10/14/18 23:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	34		10 - 150	10/14/18 09:11	10/14/18 23:07	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	21.8	J	1.62	0.33	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluoropentanoic acid (PFPeA)	7.63		1.62	0.61	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorohexanoic acid (PFHxA)	2.91		1.62	0.19	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluoroheptanoic acid (PFHpA)	3.48		1.62	0.26	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorooctanoic acid (PFOA)	11.8		1.62	0.26	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorononanoic acid (PFNA)	1.62	U	1.62	0.31	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorodecanoic acid (PFDA)	1.62	U	1.62	0.31	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluoroundecanoic acid (PFUnA)	1.62	U	1.62	0.20	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorododecanoic acid (PFDoA)	1.62	U	1.62	0.28	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorotridecanoic acid (PFTriA)	1.62	U	1.62	0.19	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorotetradecanoic acid (PFTeA)	1.62	U	1.62	0.36	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorobutanesulfonic acid (PFBS)	1.62	U	1.62	0.36	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorohexanesulfonic acid (PFHxS)	1.43	J	1.62	0.21	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.62	U	1.62	0.66	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorooctanesulfonic acid (PFOS)	1.62	U	1.62	0.61	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorodecanesulfonic acid (PFDS)	1.62	U	1.62	0.43	ng/L		10/22/18 13:00	10/24/18 00:16	1
Perfluorooctanesulfonamide (FOSA)	1.62	U	1.62	0.45	ng/L		10/22/18 13:00	10/24/18 00:16	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.2	U	16.2	0.36	ng/L		10/22/18 13:00	10/24/18 00:16	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2	U	16.2	0.57	ng/L		10/22/18 13:00	10/24/18 00:16	1
6:2 FTS	40.5	J	16.2	0.81	ng/L		10/22/18 13:00	10/24/18 00:16	1
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/22/18 13:00	10/24/18 00:16	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	16	*	25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C5-PFPeA DNU	28		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C2 PFHxA	42		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C4 PFHpA	70		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C4 PFOA	89		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C5 PFNA	107		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C2 PFDA	114		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C2 PFUnA	124		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C2 PFDoA	122		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C2 PFTeDA	111		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C3 PFBS	76		25 - 150	10/22/18 13:00	10/24/18 00:16	1
18O2 PFHxS	95		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C4 PFOS	120		25 - 150	10/22/18 13:00	10/24/18 00:16	1
13C8 FOSA	75		25 - 150	10/22/18 13:00	10/24/18 00:16	1
d3-NMeFOSAA	103		25 - 150	10/22/18 13:00	10/24/18 00:16	1
d5-NEtFOSAA	121		25 - 150	10/22/18 13:00	10/24/18 00:16	1
M2-6:2 FTS	164	*	25 - 150	10/22/18 13:00	10/24/18 00:16	1
M2-8:2 FTS	134		25 - 150	10/22/18 13:00	10/24/18 00:16	1

DRAFT

Client Sample ID: MW-8B
Date Collected: 10/12/18 10:25
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.43	J.	0.20	0.016	ug/L		10/14/18 09:11	10/14/18 23:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*41*		*10 - 150*	*10/14/18 09:11*	*10/14/18 23:42*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	238	J.	1.66	0.34	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluoropentanoic acid (PFPeA)	130	J.	1.66	0.62	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorohexanoic acid (PFHxA)	78.4	J.	1.66	0.20	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluoroheptanoic acid (PFHpA)	54.0		16.6	2.66	ng/L		10/22/18 13:00	10/24/18 14:55	10
Perfluorooctanoic acid (PFOA)	105		16.6	2.66	ng/L		10/22/18 13:00	10/24/18 14:55	10
Perfluorononanoic acid (PFNA)	6.92		1.66	0.32	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorodecanoic acid (PFDA)	1.47	J.	1.66	0.32	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluoroundecanoic acid (PFUnA)	~~0.28 J B~~ 1.66U.		1.66	0.21	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorododecanoic acid (PFDoA)	1.66 U		1.66	0.29	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorotridecanoic acid (PFTriA)	1.66 U		1.66	0.20	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorotetradecanoic acid (PFTeA)	1.66 U		1.66	0.37	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorobutanesulfonic acid (PFBS)	9.03		1.66	0.37	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorohexanesulfonic acid (PFHxS)	20.2		16.6	2.16	ng/L		10/22/18 13:00	10/24/18 14:55	10
Perfluoroheptanesulfonic Acid (PFHpS)	0.97	J.	1.66	0.68	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorooctanesulfonic acid (PFOS)	41.6		1.66	0.63	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorodecanesulfonic acid (PFDS)	1.66 U		1.66	0.44	ng/L		10/22/18 13:00	10/24/18 01:19	1
Perfluorooctanesulfonamide (FOSA)	0.52	J.	1.66	0.46	ng/L		10/22/18 13:00	10/24/18 01:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.6 U		16.6	0.37	ng/L		10/22/18 13:00	10/24/18 01:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.75	J.	16.6	0.58	ng/L		10/22/18 13:00	10/24/18 01:19	1
6:2 FTS	3.97	J.	16.6	0.83	ng/L		10/22/18 13:00	10/24/18 01:19	1
8:2 FTS	16.6 U		16.6	0.46	ng/L		10/22/18 13:00	10/24/18 01:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*13*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C5-PFPeA DNU	*18*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C2 PFHxA	*24*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C4 PFHpA	*68*		*25 - 150*	*10/22/18 13:00*	*10/24/18 14:55*	*10*
13C4 PFOA	*99*		*25 - 150*	*10/22/18 13:00*	*10/24/18 14:55*	*10*
13C5 PFNA	*107*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C2 PFDA	*127*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C2 PFUnA	*147*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C2 PFDoA	*124*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C2 PFTeDA	*138*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C3 PFBS	*82*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
18O2 PFHxS	*77*		*25 - 150*	*10/22/18 13:00*	*10/24/18 14:55*	*10*
13C4 PFOS	*141*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
13C8 FOSA	*87*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*
d3-NMeFOSAA	*122*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:19*	*1*

DRAFT

Client Sample ID: MW-8B

Date Collected: 10/12/18 10:25
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	172	*	25 - 150	10/22/18 13:00	10/24/18 01:19	1
M2-6:2 FTS	290	*	25 - 150	10/22/18 13:00	10/24/18 01:19	1
M2-8:2 FTS	281	*	25 - 150	10/22/18 13:00	10/24/18 01:19	1

Client Sample ID: MW-11B

Date Collected: 10/12/18 11:55
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.1	J ·	0.20	0.016	ug/L		10/14/18 09:11	10/14/18 23:59	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	40		10 - 150	10/14/18 09:11	10/14/18 23:59	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**17.2**	J ·	1.60	0.33	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluoropentanoic acid (PFPeA)	**71.0**		1.60	0.60	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorohexanoic acid (PFHxA)	**8.24**		1.60	0.19	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluoroheptanoic acid (PFHpA)	**3.10**	J	8.00	1.28	ng/L		10/22/18 13:00	10/24/18 01:35	5
Perfluorooctanoic acid (PFOA)	**7.69**	J	8.00	1.28	ng/L		10/22/18 13:00	10/24/18 01:35	5
Perfluorononanoic acid (PFNA)	**0.35**	J	1.60	0.30	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorodecanoic acid (PFDA)	1.60	U	1.60	0.30	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluoroundecanoic acid (PFUnA)	~~0.40 J B~~ 1.60 U ·		1.60	0.20	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorododecanoic acid (PFDoA)	1.60	U	1.60	0.28	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorotridecanoic acid (PFTriA)	1.60	U	1.60	0.19	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorotetradecanoic acid (PFTeA)	1.60	U	1.60	0.36	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorobutanesulfonic acid (PFBS)	**16.7**		1.60	0.35	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorohexanesulfonic acid (PFHxS)	**2.80**	J	8.00	1.04	ng/L		10/22/18 13:00	10/24/18 01:35	5
Perfluoroheptanesulfonic Acid (PFHpS)	1.60	U	1.60	0.66	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorooctanesulfonic acid (PFOS)	1.60	U	1.60	0.61	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorodecanesulfonic acid (PFDS)	1.60	U	1.60	0.42	ng/L		10/22/18 13:00	10/24/18 15:11	1
Perfluorooctanesulfonamide (FOSA)	1.60	U	1.60	0.45	ng/L		10/22/18 13:00	10/24/18 15:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.0	U	16.0	0.36	ng/L		10/22/18 13:00	10/24/18 15:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.0	U	16.0	0.56	ng/L		10/22/18 13:00	10/24/18 15:11	1
6:2 FTS	16.0	U	16.0	0.80	ng/L		10/22/18 13:00	10/24/18 15:11	1
8:2 FTS	16.0	U	16.0	0.45	ng/L		10/22/18 13:00	10/24/18 15:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	14	*	25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C5-PFPeA DNU	25		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C2 PFHxA	30		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C4 PFHpA	70		25 - 150	10/22/18 13:00	10/24/18 01:35	5
13C4 PFOA	78		25 - 150	10/22/18 13:00	10/24/18 01:35	5
13C5 PFNA	103		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C2 PFDA	116		25 - 150	10/22/18 13:00	10/24/18 15:11	1

DRAFT

Client Sample ID: MW-11B

Date Collected: 10/12/18 11:55
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	131		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C2 PFDoA	123		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C2 PFTeDA	128		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C3 PFBS	70		25 - 150	10/22/18 13:00	10/24/18 15:11	1
18O2 PFHxS	88		25 - 150	10/22/18 13:00	10/24/18 01:35	5
13C4 PFOS	115		25 - 150	10/22/18 13:00	10/24/18 15:11	1
13C8 FOSA	94		25 - 150	10/22/18 13:00	10/24/18 15:11	1
d3-NMeFOSAA	124		25 - 150	10/22/18 13:00	10/24/18 15:11	1
d5-NEtFOSAA	136		25 - 150	10/22/18 13:00	10/24/18 15:11	1
M2-6:2 FTS	205	*	25 - 150	10/22/18 13:00	10/24/18 15:11	1
M2-8:2 FTS	194	*	25 - 150	10/22/18 13:00	10/24/18 15:11	1

Client Sample ID: DUP-100118-1

Date Collected: 10/12/18 00:00
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.53	J	0.20	0.016	ug/L		10/14/18 09:11	10/15/18 00:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	27		10 - 150	10/14/18 09:11	10/15/18 00:17	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	242	J	1.62	0.33	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluoropentanoic acid (PFPeA)	124	J	1.62	0.61	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorohexanoic acid (PFHxA)	75.6		1.62	0.19	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluoroheptanoic acid (PFHpA)	45.8		16.2	2.59	ng/L		10/22/18 13:00	10/24/18 15:27	10
Perfluorooctanoic acid (PFOA)	118		16.2	2.59	ng/L		10/22/18 13:00	10/24/18 15:27	10
Perfluorononanoic acid (PFNA)	6.37		1.62	0.31	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorodecanoic acid (PFDA)	1.22	J	1.62	0.31	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluoroundecanoic acid (PFUnA)	~~0.43 J B~~ 1.62 U		1.62	0.20	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorododecanoic acid (PFDoA)	1.62 U		1.62	0.28	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorotridecanoic acid (PFTriA)	1.62 U		1.62	0.19	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorotetradecanoic acid (PFTeA)	1.62 U		1.62	0.36	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorobutanesulfonic acid (PFBS)	11.5		1.62	0.36	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorohexanesulfonic acid (PFHxS)	18.7		16.2	2.10	ng/L		10/22/18 13:00	10/24/18 15:27	10
Perfluoroheptanesulfonic Acid (PFHpS)	0.86	J	1.62	0.66	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorooctanesulfonic acid (PFOS)	42.2		1.62	0.61	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorodecanesulfonic acid (PFDS)	1.62 U		1.62	0.43	ng/L		10/22/18 13:00	10/24/18 01:51	1
Perfluorooctanesulfonamide (FOSA)	1.62 U		1.62	0.45	ng/L		10/22/18 13:00	10/24/18 01:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.2 U		16.2	0.36	ng/L		10/22/18 13:00	10/24/18 01:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2 U		16.2	0.57	ng/L		10/22/18 13:00	10/24/18 01:51	1
6:2 FTS	4.10	J	16.2	0.81	ng/L		10/22/18 13:00	10/24/18 01:51	1

DRAFT

Client Sample ID: DUP-100118-1
Date Collected: 10/12/18 00:00
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/22/18 13:00	10/24/18 01:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*13*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C5-PFPeA DNU	*20*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C2 PFHxA	*26*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/22/18 13:00*	*10/24/18 15:27*	*10*
13C4 PFOA	*90*		*25 - 150*	*10/22/18 13:00*	*10/24/18 15:27*	*10*
13C5 PFNA	*114*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C2 PFDA	*129*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C2 PFUnA	*141*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C2 PFDoA	*126*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C2 PFTeDA	*135*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
18O2 PFHxS	*89*		*25 - 150*	*10/22/18 13:00*	*10/24/18 15:27*	*10*
13C4 PFOS	*141*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
13C8 FOSA	*88*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
d3-NMeFOSAA	*123*		*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
d5-NEtFOSAA	*163*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
M2-6:2 FTS	*279*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*
M2-8:2 FTS	*269*	*	*25 - 150*	*10/22/18 13:00*	*10/24/18 01:51*	*1*

Client Sample ID: FB-100118-1
Date Collected: 10/12/18 08:40
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.12	J.	0.20	0.016	ug/L		10/14/18 09:11	10/15/18 00:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*40*		*10 - 150*	*10/14/18 09:11*	*10/15/18 00:34*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.65	U	1.65	0.34	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluoropentanoic acid (PFPeA)	1.65	U	1.65	0.62	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorohexanoic acid (PFHxA)	1.65	U	1.65	0.20	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluoroheptanoic acid (PFHpA)	1.65	U	1.65	0.26	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorooctanoic acid (PFOA)	1.65	U	1.65	0.26	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorononanoic acid (PFNA)	1.65	U	1.65	0.31	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorodecanoic acid (PFDA)	1.65	U	1.65	0.31	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluoroundecanoic acid (PFUnA)	~~0.30~~ ~~J B~~ 1.65 U		1.65	0.21	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorododecanoic acid (PFDoA)	1.65	U	1.65	0.29	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorotridecanoic acid (PFTriA)	1.65	U	1.65	0.20	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorotetradecanoic acid (PFTeA)	1.65	U	1.65	0.37	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorobutanesulfonic acid (PFBS)	1.65	U	1.65	0.36	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorohexanesulfonic acid (PFHxS)	1.65	U	1.65	0.21	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.65	U	1.65	0.68	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorooctanesulfonic acid (PFOS)	1.65	U	1.65	0.63	ng/L		10/22/18 13:00	10/24/18 02:07	1

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Client Sample ID: FB-100118-1
Date Collected: 10/12/18 08:40
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166801-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	1.65	U	1.65	0.44	ng/L		10/22/18 13:00	10/24/18 02:07	1
Perfluorooctanesulfonamide (FOSA)	1.65	U	1.65	0.46	ng/L		10/22/18 13:00	10/24/18 02:07	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.5	U	16.5	0.37	ng/L		10/22/18 13:00	10/24/18 02:07	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.5	U	16.5	0.58	ng/L		10/22/18 13:00	10/24/18 02:07	1
6:2 FTS	16.5	U	16.5	0.83	ng/L		10/22/18 13:00	10/24/18 02:07	1
8:2 FTS	16.5	U	16.5	0.46	ng/L		10/22/18 13:00	10/24/18 02:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*75*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C5-PFPeA DNU	*79*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C2 PFHxA	*86*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C4 PFOA	*86*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C5 PFNA	*86*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C2 PFDA	*94*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C2 PFUnA	*89*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C2 PFDoA	*82*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C2 PFTeDA	*94*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C3 PFBS	*93*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
18O2 PFHxS	*96*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C4 PFOS	*106*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
13C8 FOSA	*52*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
d3-NMeFOSAA	*75*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
M2-6:2 FTS	*99*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*
M2-8:2 FTS	*88*		*25 - 150*	*10/22/18 13:00*	*10/24/18 02:07*	*1*

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultarts, Inc.				Job #:

Address: 455 Winding Brook Drive Suite 201	Due Date Requested:	Analysis Requested
City: Glastonbury	TAT Requested (days): 10 days	
State, Zip: CT, 06033		
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.8	
Email: mfelter@geiconsultants.com	WO #:	
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288	
Site/Project Description: Equity-PFAS-1803556-1.8	SSOW#:	

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=soils, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
MW-6B	10/12/18	0810	G	Water	N	Y	X	X	12	MS/MSD
MW-8B	10/12/18	1025	G	Water	N	N	X	X	4	
MW-11B	10/12/18	1155	G	Water	N	N	X	X	4	
DUP-101218	10/12/18	–	G	Water	N	N	X	X	4	
FB-101218	10/12/18	0840	G	Water	N	N	X	X	4	

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Possible Hazard Identification
[x] 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 [x] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 08/04/2016

Site: Long Island Emerging Contaminants, Far Rockaway
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166349
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-116D	460-166349-01	PFAS, 1,4-Dioxane
MW-118DR	460-166349-02	PFAS, 1,4-Dioxane
MW-119D	460-166349-03	PFAS, 1,4-Dioxane
DUP-100418	460-166349-04	PFAS, 1,4-Dioxane
FB-1004118*	460-166349-05	PFAS, 1,4-Dioxane

* Collection date 10/04/18

Associated QC Samples:
Field Blank: FB-1004118
Field Duplicate pair: MW-119D/DUP-100418

The above-listed aqueous samples and field blank sample were collected on October 4, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

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In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

1,4-Dioxane and PFAS

Analytes were detected in the associated laboratory method and field blank samples. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane				
1,4-Dioxane	FB-100418: All samples	0.14 ug/L	1.4 ug/L	Validation actions were not required.
PFAS				
Perfluorooctanoic acid (PFOA)	Method MB 200-135439: All samples	0.321 ng/L	3.21 ng/L	Qualify the result for Perfluorooctanoic acid (PFOA) in sample FB-1004118 as nondetect (U) at the RL.
Perfluoroundecanoic acid (PFUnA)		0.301 ng/L	3.01 ng/L	Qualify the results for Perfluoroundecanoic acid (PFUnA) in samples MW-116D, MW-119D, DUP-100418, and FB-1004118 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method

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recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-116D	M2-6:2 FTS	194	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-116D.
MW-118DR	M2-6:2 FTS	216	25-150	Validation actions were not required as the results for 6:2 FTS were not detected in these samples and therefore not affected by the high recoveries.
MW-119D		236		
DUP-100418		215		
FB-1004118		171		

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-118DR for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples MW-119D and DUP-100418 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-119D (ng/L)	DUP-100418 (ng/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	8.75	9.02	3.0
Perfluoropentanoic (PFPeA)	10.0	9.60	4.1
Perfluorohexanoic acid (PFHxA)	10.7	10.6	0.9
Perfluoroheptanoic acid (PFHpA)	9.58	9.80	2.3
Perfluorooctanoic acid (PFOA)	29.2	30.6	4.7
Perfluorononanoic acid (PFNA)	1.71	1.48 J	14.4

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Analyte	MW-119D (ng/L)	DUP-100418 (ng/L)	RPD (%)
Perfluorodecanoic acid (PFDA)	0.41 J	0.35 J	15.8
Perfluorobutanesulfonic acid (PFBS)	2.20	2.39	8.3
Perfluorohexanesulfonic acid(PFHxS)	17.1	17.6	2.9
Perfluoroheptanesulfonic Acid (PFHpS)	1.60 J	1.83	13.4
Perfluorooctanesulfonic acid (PFOS)	48.0	46.5	3.2
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Dilutions were not required.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: MW-116D
Date Collected: 10/04/18 14:10
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 13:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*48*		*10 - 150*	*10/09/18 20:13*	*10/10/18 13:14*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**8.02**		1.74	0.36	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluoropentanoic acid (PFPeA)	**15.1**		1.74	0.65	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorohexanoic acid (PFHxA)	**16.1**		1.74	0.21	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluoroheptanoic acid (PFHpA)	**11.8**		1.74	0.28	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorooctanoic acid (PFOA)	**33.6**	B	1.74	0.28	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorononanoic acid (PFNA)	**1.21**	J	1.74	0.33	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorodecanoic acid (PFDA)	1.74	U	1.74	0.33	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluoroundecanoic acid (PFUnA)	~~0.24~~ 1.74	~~J B~~ U	1.74	0.22	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorododecanoic acid (PFDoA)	1.74	U	1.74	0.30	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorotridecanoic acid (PFTriA)	1.74	U	1.74	0.21	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorotetradecanoic acid (PFTeA)	1.74	U	1.74	0.39	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorobutanesulfonic acid (PFBS)	**2.80**		1.74	0.38	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorohexanesulfonic acid (PFHxS)	**14.8**		1.74	0.23	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.33**	J	1.74	0.71	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorooctanesulfonic acid (PFOS)	**40.4**		1.74	0.66	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorodecanesulfonic acid (PFDS)	1.74	U	1.74	0.46	ng/L		10/18/18 13:58	10/21/18 13:51	1
Perfluorooctanesulfonamide (FOSA)	1.74	U	1.74	0.49	ng/L		10/18/18 13:58	10/21/18 13:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.4	U	17.4	0.39	ng/L		10/18/18 13:58	10/21/18 13:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.4	U	17.4	0.61	ng/L		10/18/18 13:58	10/21/18 13:51	1
6:2 FTS	**1.09**	J	17.4	0.87	ng/L		10/18/18 13:58	10/21/18 13:51	1
8:2 FTS	17.4	U	17.4	0.49	ng/L		10/18/18 13:58	10/21/18 13:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*50*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C5-PFPeA DNU	*77*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C2 PFHxA	*72*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C4 PFHpA	*74*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C5 PFNA	*83*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C2 PFDA	*89*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C2 PFUnA	*96*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C2 PFDoA	*99*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C2 PFTeDA	*96*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C3 PFBS	*108*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
18O2 PFHxS	*114*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C4 PFOS	*113*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
13C8 FOSA	*61*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
d3-NMeFOSAA	*84*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*

DRAFT

11/13/18

Client Sample ID: MW-116D

Date Collected: 10/04/18 14:10
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
M2-6:2 FTS	*194*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*
M2-8:2 FTS	*123*		*25 - 150*	*10/18/18 13:58*	*10/21/18 13:51*	*1*

Client Sample ID: MW-118DR

Date Collected: 10/04/18 10:15
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 13:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*52*		*10 - 150*	*10/09/18 20:13*	*10/10/18 13:31*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**9.01**		1.72	0.35	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluoropentanoic acid (PFPeA)	**14.0**		1.72	0.65	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorohexanoic acid (PFHxA)	**15.8**		1.72	0.21	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluoroheptanoic acid (PFHpA)	**14.5**		1.72	0.28	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorooctanoic acid (PFOA)	**40.5**	B	1.72	0.28	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorononanoic acid (PFNA)	**1.94**		1.72	0.33	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorodecanoic acid (PFDA)	**0.33**	J	1.72	0.33	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluoroundecanoic acid (PFUnA)	1.72	U	1.72	0.22	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorododecanoic acid (PFDoA)	1.72	U	1.72	0.30	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorotridecanoic acid (PFTriA)	1.72	U	1.72	0.21	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorotetradecanoic acid (PFTeA)	1.72	U	1.72	0.39	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorobutanesulfonic acid (PFBS)	**3.34**		1.72	0.38	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorohexanesulfonic acid (PFHxS)	**22.5**		1.72	0.22	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluoroheptanesulfonic Acid (PFHpS)	**2.07**		1.72	0.71	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorooctanesulfonic acid (PFOS)	**125**		1.72	0.65	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorodecanesulfonic acid (PFDS)	1.72	U	1.72	0.46	ng/L		10/18/18 13:58	10/21/18 14:07	1
Perfluorooctanesulfonamide (FOSA)	1.72	U	1.72	0.48	ng/L		10/18/18 13:58	10/21/18 14:07	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.2	U	17.2	0.39	ng/L		10/18/18 13:58	10/21/18 14:07	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.2	U	17.2	0.60	ng/L		10/18/18 13:58	10/21/18 14:07	1
6:2 FTS	17.2	U	17.2	0.86	ng/L		10/18/18 13:58	10/21/18 14:07	1
8:2 FTS	17.2	U	17.2	0.48	ng/L		10/18/18 13:58	10/21/18 14:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*44*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C5-PFPeA DNU	*73*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C2 PFHxA	*71*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C4 PFHpA	*82*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C4 PFOA	*96*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C5 PFNA	*92*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C2 PFDA	*105*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C2 PFUnA	*108*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*

DRAFT

Client Sample ID: MW-118DR

Date Collected: 10/04/18 10:15
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*108*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C2 PFTeDA	*101*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C3 PFBS	*102*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
18O2 PFHxS	*115*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C4 PFOS	*116*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
13C8 FOSA	*54*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
d3-NMeFOSAA	*91*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
M2-6:2 FTS	*216*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*
M2-8:2 FTS	*125*		*25 - 150*	*10/18/18 13:58*	*10/21/18 14:07*	*1*

Client Sample ID: MW-119D

Date Collected: 10/04/18 12:20
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 14:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*50*		*10 - 150*	*10/09/18 20:13*	*10/10/18 14:23*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**8.75**		1.63	0.33	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluoropentanoic acid (PFPeA)	**10.0**		1.63	0.61	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorohexanoic acid (PFHxA)	**10.7**		1.63	0.20	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluoroheptanoic acid (PFHpA)	**9.58**		1.63	0.26	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorooctanoic acid (PFOA)	**29.2**	B	1.63	0.26	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorononanoic acid (PFNA)	**1.71**		1.63	0.31	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorodecanoic acid (PFDA)	**0.41**	J	1.63	0.31	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluoroundecanoic acid (PFUnA)	~~0.57~~	~~J B~~ 1.63U	1.63	0.20	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorododecanoic acid (PFDoA)	1.63	U	1.63	0.29	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorotridecanoic acid (PFTriA)	1.63	U	1.63	0.20	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorotetradecanoic acid (PFTeA)	1.63	U	1.63	0.37	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorobutanesulfonic acid (PFBS)	**2.20**		1.63	0.36	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorohexanesulfonic acid (PFHxS)	**17.1**		1.63	0.21	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.60**	J	1.63	0.67	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorooctanesulfonic acid (PFOS)	**48.0**		1.63	0.62	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorodecanesulfonic acid (PFDS)	1.63	U	1.63	0.43	ng/L		10/18/18 13:58	10/21/18 14:55	1
Perfluorooctanesulfonamide (FOSA)	1.63	U	1.63	0.46	ng/L		10/18/18 13:58	10/21/18 14:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.3	U	16.3	0.37	ng/L		10/18/18 13:58	10/21/18 14:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.3	U	16.3	0.57	ng/L		10/18/18 13:58	10/21/18 14:55	1
6:2 FTS	16.3	U	16.3	0.82	ng/L		10/18/18 13:58	10/21/18 14:55	1
8:2 FTS	16.3	U	16.3	0.46	ng/L		10/18/18 13:58	10/21/18 14:55	1

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Client Sample ID: MW-119D

Date Collected: 10/04/18 12:20
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	47		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C5-PFPeA DNU	75		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C2 PFHxA	72		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C4 PFHpA	79		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C4 PFOA	85		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C5 PFNA	86		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C2 PFDA	88		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C2 PFUnA	90		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C2 PFDoA	85		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C2 PFTeDA	92		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C3 PFBS	105		25 - 150	10/18/18 13:58	10/21/18 14:55	1
18O2 PFHxS	113		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C4 PFOS	106		25 - 150	10/18/18 13:58	10/21/18 14:55	1
13C8 FOSA	62		25 - 150	10/18/18 13:58	10/21/18 14:55	1
d3-NMeFOSAA	75		25 - 150	10/18/18 13:58	10/21/18 14:55	1
d5-NEtFOSAA	83		25 - 150	10/18/18 13:58	10/21/18 14:55	1
M2-6:2 FTS	236	*	25 - 150	10/18/18 13:58	10/21/18 14:55	1
M2-8:2 FTS	117		25 - 150	10/18/18 13:58	10/21/18 14:55	1

Client Sample ID: DUP-100418

Date Collected: 10/04/18 00:00
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 14:41	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	48		10 - 150	10/09/18 20:13	10/10/18 14:41	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**9.02**		1.65	0.34	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluoropentanoic acid (PFPeA)	**9.60**		1.65	0.62	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorohexanoic acid (PFHxA)	**10.6**		1.65	0.20	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluoroheptanoic acid (PFHpA)	**9.80**		1.65	0.26	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorooctanoic acid (PFOA)	**30.6**	B	1.65	0.26	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorononanoic acid (PFNA)	**1.48**	J	1.65	0.31	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorodecanoic acid (PFDA)	**0.35**	J	1.65	0.31	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluoroundecanoic acid (PFUnA)	~~0.44~~	~~J B~~ 1.65U	1.65	0.21	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorododecanoic acid (PFDoA)	1.65	U	1.65	0.29	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorotridecanoic acid (PFTriA)	1.65	U	1.65	0.20	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorotetradecanoic acid (PFTeA)	1.65	U	1.65	0.37	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorobutanesulfonic acid (PFBS)	**2.39**		1.65	0.36	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorohexanesulfonic acid (PFHxS)	**17.6**		1.65	0.21	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.83**		1.65	0.68	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorooctanesulfonic acid (PFOS)	**46.5**		1.65	0.63	ng/L		10/18/18 13:58	10/21/18 15:11	1
Perfluorodecanesulfonic acid (PFDS)	1.65	U	1.65	0.44	ng/L		10/18/18 13:58	10/21/18 15:11	1

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Client Sample ID: DUP-100418

Date Collected: 10/04/18 00:00
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (FOSA)	1.65	U	1.65	0.46	ng/L		10/18/18 13:58	10/21/18 15:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.5	U	16.5	0.37	ng/L		10/18/18 13:58	10/21/18 15:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.5	U	16.5	0.58	ng/L		10/18/18 13:58	10/21/18 15:11	1
6:2 FTS	16.5	U	16.5	0.82	ng/L		10/18/18 13:58	10/21/18 15:11	1
8:2 FTS	16.5	U	16.5	0.46	ng/L		10/18/18 13:58	10/21/18 15:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*44*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C5-PFPeA DNU	*71*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C2 PFHxA	*70*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C4 PFOA	*85*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C5 PFNA	*87*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C2 PFDA	*89*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C2 PFUnA	*95*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C2 PFDoA	*97*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C2 PFTeDA	*94*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C3 PFBS	*95*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
18O2 PFHxS	*106*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C4 PFOS	*101*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
13C8 FOSA	*50*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
d5-NEtFOSAA	*81*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
M2-6:2 FTS	*215*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*
M2-8:2 FTS	*110*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:11*	*1*

Client Sample ID: FB-1004118

Date Collected: 10/04/18 12:30
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.14	J	0.21	0.017	ug/L		10/09/18 20:13	10/10/18 14:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*48*		*10 - 150*	*10/09/18 20:13*	*10/10/18 14:58*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.61	U	1.61	0.33	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluoropentanoic acid (PFPeA)	1.61	U	1.61	0.60	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorohexanoic acid (PFHxA)	1.61	U	1.61	0.19	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluoroheptanoic acid (PFHpA)	1.61	U	1.61	0.26	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorooctanoic acid (PFOA)	~~0.28~~	~~J B~~ 1.61 U	1.61	0.26	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorononanoic acid (PFNA)	1.61	U	1.61	0.31	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorodecanoic acid (PFDA)	1.61	U	1.61	0.31	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluoroundecanoic acid (PFUnA)	~~0.29~~	~~J B~~ 1.61 U	1.61	0.20	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorododecanoic acid (PFDoA)	1.61	U	1.61	0.28	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorotridecanoic acid (PFTriA)	1.61	U	1.61	0.19	ng/L		10/18/18 13:58	10/21/18 15:26	1

DRAFT

Client: GEI Consultants, Inc.
Project/Site: Far Rockaway-PFAS-1803556-1.7

TestAmerica Job ID: 460-166349-1

Client Sample ID: FB-1004118
Date Collected: 10/04/18 12:30
Date Received: 10/05/18 18:30

Lab Sample ID: 460-166349-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	1.61	U	1.61	0.36	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorobutanesulfonic acid (PFBS)	1.61	U	1.61	0.35	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorohexanesulfonic acid (PFHxS)	1.61	U	1.61	0.21	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.61	U	1.61	0.66	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorooctanesulfonic acid (PFOS)	1.61	U	1.61	0.61	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorodecanesulfonic acid (PFDS)	1.61	U	1.61	0.43	ng/L		10/18/18 13:58	10/21/18 15:26	1
Perfluorooctanesulfonamide (FOSA)	1.61	U	1.61	0.45	ng/L		10/18/18 13:58	10/21/18 15:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.1	U	16.1	0.36	ng/L		10/18/18 13:58	10/21/18 15:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.1	U	16.1	0.56	ng/L		10/18/18 13:58	10/21/18 15:26	1
6:2 FTS	16.1	U	16.1	0.81	ng/L		10/18/18 13:58	10/21/18 15:26	1
8:2 FTS	16.1	U	16.1	0.45	ng/L		10/18/18 13:58	10/21/18 15:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*85*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C5-PFPeA DNU	*111*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C2 PFHxA	*107*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C4 PFHpA	*93*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C4 PFOA	*97*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C5 PFNA	*99*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C2 PFDA	*98*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C2 PFUnA	*97*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C2 PFDoA	*93*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C2 PFTeDA	*89*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C3 PFBS	*107*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
18O2 PFHxS	*97*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C4 PFOS	*103*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
13C8 FOSA	*60*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
M2-6:2 FTS	*171*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*
M2-8:2 FTS	*104*		*25 - 150*	*10/18/18 13:58*	*10/21/18 15:26*	*1*

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

NYSC 460501

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 166349
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:			
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.7			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Far Rockaway-PFAS-1803556-1.7	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, 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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N		
MW-116D	10/4/18	1410	G	Water	N		X	X	4	1
MW-118DR	10/4/18	1015	G	Water	N		X	X	12	2 MS/MSD
MW-119D	10/4/18	1220	G	Water	N		X	X	4	3
DUP-100418	10/4/18	—	G	Water	N	N	X	X	4	4
FB-100418	10/4/18	1230	G	Water	N	N	X	X	4	5

460-166349 Chain of Custody

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Possible Hazard Identification
x 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 x Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into one login and ship PFAS

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 10/5/18 1230	Company: GEI	Received by:
Relinquished by:	Date/Time: 10/5/18 18:30	Company: FedEx	Received by:
Relinquished by:	Date/Time:	Company:	Received by:

Relinquished by:	Date/Time:	Company:	Received by:	Date/Time: 10/5/18 1230	Company:
Relinquished by:	Date/Time: 10/5/18 18:30	Company: FedEx	Received by:	Date/Time: 10/6/18 1630	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

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

3.0/3.0 3.1/3.1 +RT 9

Ver: 08/04/2016

Site: Long Island Emerging Contaminants, Flatbush
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166699
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-2	460-166699-01	PFAS, 1,4-Dioxane
MW-4	460-166699-02	PFAS, 1,4-Dioxane
MW-7	460-166699-03	PFAS, 1,4-Dioxane
DUP-100918	460-166699-04	PFAS, 1,4-Dioxane
FB-100918	460-166699-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100918
Field Duplicate pair: MW-7/DUP-100918

The above-listed aqueous samples and field blank sample were collected on October 9, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

DRAFT

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

1,4-Dioxane and PFAS

Analytes were detected in the associated laboratory method and field blank samples. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane				
1,4-Dioxane	FB-100918: All samples	0.12 ug/L	1.2 ug/L	Qualify the results for 1,4-dioxane in samples MW-2 and MW-4 as nondetect (U) at the RL.
PFAS				
Perfluoroundecanoic acid (PFUnA)	Method MB 200-135487: All samples	0.319 ng/L	3.19 ng/L	Qualify the results for Perfluoroundecanoic acid (PFUnA) in samples MW-2, MW-4, MW-7, DUP-100918, and FB-100918 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

DRAFT

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-2	M2-6:2 FTS	210	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-2.
MW-4	M2-6:2 FTS	339	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-4.
	M2-8:2 FTS	224		Validation action was not required as the result for 8:2 FTS was not detected in sample MW-4 and therefore not affected by the high recovery.
MW-7	M2-6:2 FTS	320	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-7.
DUP-100918	M2-6:2 FTS	220	25-150	Estimate (J) the positive result for 6:2 FTS in sample DUP-100918.
FB-100918	M2-6:2 FTS	163	25-150	Validation actions were not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-2 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples MW-7 and DUP-100918 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-7 (ng/L)	DUP-100918 (ng/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	5.70	6.78	17.3
Perfluoropentanoic (PFPeA)	10.2	10.3	1.0
Perfluorohexanoic acid (PFHxA)	10.1	9.61	5.0

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Analyte	MW-7 (ng/L)	DUP-100918 (ng/L)	RPD (%)
Perfluoroheptanoic acid (PFHpA)	9.36	9.09	2.9
Perfluorooctanoic acid (PFOA)	57.3	57.9	1.0
Perfluorononanoic acid (PFNA)	4.06	3.83	5.8
Perfluorodecanoic acid (PFDA)	1.49 J	1.49 J	0
Perfluorobutanesulfonic acid (PFBS)	3.06	3.36	9.3
Perfluorohexanesulfonic acid(PFHxS)	5.55	5.13	7.9
Perfluorooctanesulfonic acid (PFOS)	31.6	32.2	1.9
Perfluorodecanesulfonic acid (PFDS)	0.57 J	0.97 J	51.9, Within the RL
6:2 FTS	7.74 J	7.13 J	8.2
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Dilutions were not required.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DRAFT

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample ID: MW-2

Date Collected: 10/09/18 11:20
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-1

Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.087~~	~~J~~ 0.20U	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 19:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*34*		*10 - 150*	*10/13/18 10:08*	*10/13/18 19:36*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**10.7**		1.68	0.35	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluoropentanoic acid (PFPeA)	**15.2**		1.68	0.63	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorohexanoic acid (PFHxA)	**13.0**		1.68	0.20	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluoroheptanoic acid (PFHpA)	**11.8**		1.68	0.27	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorooctanoic acid (PFOA)	**65.7**		1.68	0.27	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorononanoic acid (PFNA)	**3.01**		1.68	0.32	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorodecanoic acid (PFDA)	**0.74**	J	1.68	0.32	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluoroundecanoic acid (PFUnA)	~~0.52~~	~~J B~~ 1.68U	1.68	0.21	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorododecanoic acid (PFDoA)	1.68	U	1.68	0.29	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorotridecanoic acid (PFTriA)	**0.22**	J	1.68	0.20	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorotetradecanoic acid (PFTeA)	1.68	U	1.68	0.38	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorobutanesulfonic acid (PFBS)	**2.93**		1.68	0.37	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorohexanesulfonic acid (PFHxS)	**3.58**		1.68	0.22	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.99**	J	1.68	0.69	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorooctanesulfonic acid (PFOS)	**37.1**		1.68	0.64	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorodecanesulfonic acid (PFDS)	1.68	U	1.68	0.45	ng/L		10/19/18 11:40	10/21/18 20:29	1
Perfluorooctanesulfonamide (FOSA)	1.68	U	1.68	0.47	ng/L		10/19/18 11:40	10/21/18 20:29	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.8	U	16.8	0.38	ng/L		10/19/18 11:40	10/21/18 20:29	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.8	U	16.8	0.59	ng/L		10/19/18 11:40	10/21/18 20:29	1
6:2 FTS	**47.3**	J	16.8	0.84	ng/L		10/19/18 11:40	10/21/18 20:29	1
8:2 FTS	16.8	U	16.8	0.47	ng/L		10/19/18 11:40	10/21/18 20:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*52*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C5-PFPeA DNU	*76*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C2 PFHxA	*80*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C4 PFHpA	*80*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C4 PFOA	*88*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C5 PFNA	*91*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C2 PFDA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C2 PFUnA	*106*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C2 PFDoA	*111*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C2 PFTeDA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C3 PFBS	*93*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
18O2 PFHxS	*98*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C4 PFOS	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
13C8 FOSA	*51*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*
d3-NMeFOSAA	*79*		*25 - 150*	*10/19/18 11:40*	*10/21/18 20:29*	*1*

DRAFT

Client Sample ID: MW-2

Date Collected: 10/09/18 11:20
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	89		25 - 150	10/19/18 11:40	10/21/18 20:29	1
M2-6:2 FTS	210	*	25 - 150	10/19/18 11:40	10/21/18 20:29	1
M2-8:2 FTS	109		25 - 150	10/19/18 11:40	10/21/18 20:29	1

Client Sample ID: MW-4

Date Collected: 10/09/18 14:25
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.083~~	~~J~~ 0.20 U	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 21:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	37		10 - 150	10/13/18 10:08	10/13/18 21:03	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**22.4**		1.62	0.33	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluoropentanoic acid (PFPeA)	**5.00**		1.62	0.61	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorohexanoic acid (PFHxA)	**5.04**		1.62	0.19	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluoroheptanoic acid (PFHpA)	**7.16**		1.62	0.26	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorooctanoic acid (PFOA)	**53.5**		1.62	0.26	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorononanoic acid (PFNA)	**1.31**	J	1.62	0.31	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorodecanoic acid (PFDA)	1.62	U	1.62	0.31	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluoroundecanoic acid (PFUnA)	~~0.35~~	~~J B~~ 1.62 U	1.62	0.20	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorododecanoic acid (PFDoA)	1.62	U	1.62	0.28	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorotridecanoic acid (PFTriA)	1.62	U	1.62	0.19	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorotetradecanoic acid (PFTeA)	1.62	U	1.62	0.37	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorobutanesulfonic acid (PFBS)	**3.38**		1.62	0.36	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorohexanesulfonic acid (PFHxS)	**2.54**		1.62	0.21	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.62	U	1.62	0.67	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorooctanesulfonic acid (PFOS)	**23.4**		1.62	0.62	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorodecanesulfonic acid (PFDS)	1.62	U	1.62	0.43	ng/L		10/19/18 11:40	10/21/18 21:17	1
Perfluorooctanesulfonamide (FOSA)	1.62	U	1.62	0.45	ng/L		10/19/18 11:40	10/21/18 21:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.2	U	16.2	0.37	ng/L		10/19/18 11:40	10/21/18 21:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2	U	16.2	0.57	ng/L		10/19/18 11:40	10/21/18 21:17	1
6:2 FTS	**15.8**	J	16.2	0.81	ng/L		10/19/18 11:40	10/21/18 21:17	1
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/19/18 11:40	10/21/18 21:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	39		25 - 150	10/19/18 11:40	10/21/18 21:17	1
13C5-PFPeA DNU	60		25 - 150	10/19/18 11:40	10/21/18 21:17	1
13C2 PFHxA	59		25 - 150	10/19/18 11:40	10/21/18 21:17	1
13C4 PFHpA	69		25 - 150	10/19/18 11:40	10/21/18 21:17	1
13C4 PFOA	88		25 - 150	10/19/18 11:40	10/21/18 21:17	1
13C5 PFNA	105		25 - 150	10/19/18 11:40	10/21/18 21:17	1

DRAFT

Client Sample ID: MW-4

Date Collected: 10/09/18 14:25
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*105*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
13C2 PFUnA	*115*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
13C2 PFDoA	*117*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
13C2 PFTeDA	*113*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
13C3 PFBS	*70*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
18O2 PFHxS	*85*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
13C4 PFOS	*87*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
13C8 FOSA	*48*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
d3-NMeFOSAA	*90*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
d5-NEtFOSAA	*109*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
M2-6:2 FTS	*339*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*
M2-8:2 FTS	*224*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 21:17*	*1*

Client Sample ID: MW-7

Date Collected: 10/09/18 13:10
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 21:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*41*		*10 - 150*	*10/13/18 10:08*	*10/13/18 21:20*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**5.70**		1.62	0.33	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluoropentanoic acid (PFPeA)	**10.2**		1.62	0.61	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorohexanoic acid (PFHxA)	**10.1**		1.62	0.19	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluoroheptanoic acid (PFHpA)	**9.36**		1.62	0.26	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorooctanoic acid (PFOA)	**57.3**		1.62	0.26	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorononanoic acid (PFNA)	**4.06**		1.62	0.31	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorodecanoic acid (PFDA)	**1.49**	J	1.62	0.31	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluoroundecanoic acid (PFUnA)	~~0.53~~	~~J B~~ 1.62 U.	1.62	0.20	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorododecanoic acid (PFDoA)	1.62	U	1.62	0.28	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorotridecanoic acid (PFTriA)	1.62	U	1.62	0.19	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorotetradecanoic acid (PFTeA)	1.62	U	1.62	0.36	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorobutanesulfonic acid (PFBS)	**3.06**		1.62	0.36	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorohexanesulfonic acid (PFHxS)	**5.55**		1.62	0.21	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.62	U	1.62	0.66	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorooctanesulfonic acid (PFOS)	**31.6**		1.62	0.61	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorodecanesulfonic acid (PFDS)	**0.57**	J	1.62	0.43	ng/L		10/19/18 11:40	10/21/18 21:33	1
Perfluorooctanesulfonamide (FOSA)	1.62	U	1.62	0.45	ng/L		10/19/18 11:40	10/21/18 21:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.2	U	16.2	0.36	ng/L		10/19/18 11:40	10/21/18 21:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2	U	16.2	0.57	ng/L		10/19/18 11:40	10/21/18 21:33	1

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Client Sample ID: MW-7

Date Collected: 10/09/18 13:10
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
6:2 FTS	7.74	J	16.2	0.81	ng/L		10/19/18 11:40	10/21/18 21:33	1
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/19/18 11:40	10/21/18 21:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*35*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C5-PFPeA DNU	*59*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C2 PFHxA	*65*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C4 PFHpA	*75*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C4 PFOA	*85*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C5 PFNA	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C2 PFDA	*100*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C2 PFUnA	*102*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C2 PFDoA	*96*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C2 PFTeDA	*108*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C3 PFBS	*72*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
18O2 PFHxS	*92*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C4 PFOS	*98*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
13C8 FOSA	*39*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
d5-NEtFOSAA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
M2-6:2 FTS	*320*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*
M2-8:2 FTS	*129*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:33*	*1*

Client Sample ID: DUP-100918

Date Collected: 10/09/18 00:00
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 21:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*39*		*10 - 150*	*10/13/18 10:08*	*10/13/18 21:37*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**6.78**		1.61	0.33	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluoropentanoic acid (PFPeA)	**10.3**		1.61	0.60	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorohexanoic acid (PFHxA)	**9.61**		1.61	0.19	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluoroheptanoic acid (PFHpA)	**9.09**		1.61	0.26	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorooctanoic acid (PFOA)	**57.9**		1.61	0.26	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorononanoic acid (PFNA)	**3.83**		1.61	0.31	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorodecanoic acid (PFDA)	**1.49**	J	1.61	0.31	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluoroundecanoic acid (PFUnA)	~~0.38~~ ~~J B~~ 1.61U		1.61	0.20	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorododecanoic acid (PFDoA)	1.61	U	1.61	0.28	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorotridecanoic acid (PFTriA)	1.61	U	1.61	0.19	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorotetradecanoic acid (PFTeA)	1.61	U	1.61	0.36	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorobutanesulfonic acid (PFBS)	**3.36**		1.61	0.35	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorohexanesulfonic acid (PFHxS)	**5.13**		1.61	0.21	ng/L		10/19/18 11:40	10/21/18 21:49	1

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Client Sample ID: DUP-100918
Date Collected: 10/09/18 00:00
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanesulfonic Acid (PFHpS)	1.61	U	1.61	0.66	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorooctanesulfonic acid (PFOS)	**32.2**		1.61	0.61	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorodecanesulfonic acid (PFDS)	**0.97**	J	1.61	0.43	ng/L		10/19/18 11:40	10/21/18 21:49	1
Perfluorooctanesulfonamide (FOSA)	1.61	U	1.61	0.45	ng/L		10/19/18 11:40	10/21/18 21:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.1	U	16.1	0.36	ng/L		10/19/18 11:40	10/21/18 21:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.1	U	16.1	0.56	ng/L		10/19/18 11:40	10/21/18 21:49	1
6:2 FTS	**7.13**	J	16.1	0.81	ng/L		10/19/18 11:40	10/21/18 21:49	1
8:2 FTS	16.1	U	16.1	0.45	ng/L		10/19/18 11:40	10/21/18 21:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*34*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C5-PFPeA DNU	*59*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C2 PFHxA	*65*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C4 PFHpA	*76*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C5 PFNA	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C2 PFDA	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C2 PFUnA	*97*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C2 PFDoA	*98*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C2 PFTeDA	*92*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C3 PFBS	*71*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
18O2 PFHxS	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C4 PFOS	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
13C8 FOSA	*63*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
d5-NEtFOSAA	*88*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
M2-6:2 FTS	*220*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*
M2-8:2 FTS	*97*		*25 - 150*	*10/19/18 11:40*	*10/21/18 21:49*	*1*

Client Sample ID: FB-100918
Date Collected: 10/09/18 14:30
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.12**	J	0.20	0.016	ug/L		10/13/18 10:08	10/13/18 21:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*39*		*10 - 150*	*10/13/18 10:08*	*10/13/18 21:55*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.76	U	1.76	0.36	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluoropentanoic acid (PFPeA)	1.76	U	1.76	0.66	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorohexanoic acid (PFHxA)	1.76	U	1.76	0.21	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluoroheptanoic acid (PFHpA)	1.76	U	1.76	0.28	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorooctanoic acid (PFOA)	1.76	U	1.76	0.28	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorononanoic acid (PFNA)	1.76	U	1.76	0.33	ng/L		10/19/18 11:40	10/21/18 22:05	1

DRAFT

Client: GEI Consultants, Inc.
Project/Site: Flatbush-PFAS-1803556-1.17

TestAmerica Job ID: 460-166699-1

Client Sample ID: FB-100918
Date Collected: 10/09/18 14:30
Date Received: 10/10/18 18:40

Lab Sample ID: 460-166699-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	1.76	U	1.76	0.33	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluoroundecanoic acid (PFUnA)	~~0.38~~	~~J B~~ 1.76 U	1.76	0.22	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorobutanesulfonic acid (PFBS)	1.76	U	1.76	0.39	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorohexanesulfonic acid (PFHxS)	1.76	U	1.76	0.23	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.76	U	1.76	0.72	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorooctanesulfonic acid (PFOS)	1.76	U	1.76	0.67	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/19/18 11:40	10/21/18 22:05	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/19/18 11:40	10/21/18 22:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/19/18 11:40	10/21/18 22:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/19/18 11:40	10/21/18 22:05	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/19/18 11:40	10/21/18 22:05	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/19/18 11:40	10/21/18 22:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*85*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C5-PFPeA DNU	*106*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C2 PFHxA	*111*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C4 PFHpA	*91*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C4 PFOA	*97*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C2 PFDA	*97*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C2 PFUnA	*95*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C2 PFDoA	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C2 PFTeDA	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C3 PFBS	*94*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
18O2 PFHxS	*90*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C4 PFOS	*96*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
13C8 FOSA	*56*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
d3-NMeFOSAA	*84*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
d5-NEtFOSAA	*88*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
M2-6:2 FTS	*163*	*	*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*
M2-8:2 FTS	*89*		*25 - 150*	*10/19/18 11:40*	*10/21/18 22:05*	*1*

DRAFT

TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

460501

Chain of Custody Record

TestAmerica

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-283-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 166699

Address: 455 Winding Brook Drive Suite 201	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Glastonbury	TAT Requested (days): 10 days		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, Z - other (specify)
State, Zip: CT, 06033	PO #: 1803556-1.17		Other:
Phone: 860-368-5300(Tel) 860-606-9717(Fax)	WO #:		
Email: mfelter@geiconsultants.com	Project #: 46027288		
Project Name: Emerging Contaminants - Long Island/NYC	SSOW#:		
Site/Project Description: Flatbush-PFAS-1803556-1.17			

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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N			
MW-2	10/9/18	1120	G	Water	N	X	X	12	MS/MSD 1
MW-4	10/9/18	1425	G	Water	N	X	X	4	2
MW-7	10/9/18	1310	G	Water	N	X	X	4	3
DUP-100918	10/9/18	—	G	Water	N	X	X	4	4
FB-100918	10/9/18	1430	G	Water	N	X	X	4	5

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460-166699 Chain of Custody

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) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into one login and ship PFAS

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

Relinquished by:	Date/Time: 10/10/18 1123	Company: GEI Inc.	Received by:	Date/Time: 10/10/18 1217	Company: FA
Relinquished by:	Date/Time: 10/10/18 1840	Company: FA	Received by: Ken Rivera	Date/Time: 10/10/18 1840	Company: FAEDI
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:

3.0 / 3.3 3.2 / 3.2 FLBK

Ver: 08/04/2016

DRAFT

Site: Long Island Emerging Contaminants, Coney Island
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166356
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-18	460-166356-01	PFAS, 1,4-Dioxane
MW-2	460-166356-02	PFAS, 1,4-Dioxane
MW-16	460-166356-03	PFAS, 1,4-Dioxane
DUP-100518-1	460-166356-04	PFAS, 1,4-Dioxane
FB-100518-1	460-166356-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100518-1
Field Duplicate pair: MW-18/DUP-100518-1

The above-listed aqueous samples and field blank sample were collected on October 5, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were not detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorooctanoic acid (PFOA)	Method MB 200-135439: All samples	0.321 ng/L	3.21 ng/L	Validation actions were not required.
Perfluoroundecanoic acid (PFUnA)		0.301 ng/L	3.01 ng/L	Qualify the result for Perfluoroundecanoic acid (PFUnA) in samples MW-18, DUP-100518-1, and FB-100518-1 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

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Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-16	M2-6:2 FTS	386	25-150	Validation action was not required as the results for 6:2 FTS, 8:2 FTS, PFDA, and PFUnA were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	260		
	13C2 PFDA	151		
	13C2 PFUnA	183		
	D5-NEtFOSAA	208		Estimate (J) the positive result for N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA) in sample MW-16.
MW-18	13C4 PFBA	16	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA) in sample MW-18.
	D5-NetFOSAA	201		
	M2-6:2 FTS	480		Validation action was not required as the results for 6:2 FTS, 8:2 FTS, PFDoA, PFTriA, PFTeDA, and PFUnA were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	310		
	13C2 PFUnA	159		
	13C2 PFDoA	156		
	13C2 PFTeDA	168		
DUP-100518-1	13C4 PFBA	17	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA), Perfluoropentanoic acid (PFPeA), and N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA) in sample DUP-100518-1.
	D5-NetFOSAA	198		
	13C5 PFPeA	22		
	M2-6:2 FTS	420		Validation action was not required as the results for 6:2 FTS, 8:2 FTS, PFDoA, PFTriA, PFTeDA, and PFUnA were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	320		
	13C2 PFUnA	166		
	13C2 PFDoA	163		
	13C2 PFTeDA	175		

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It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-16 for 1,4-dioxane and PFAS. Recovery criteria were met for analytes which were detected at levels less than four times the matrix spike. Precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples MW-18 and DUP-100518-1 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-18 (ng/L)	DUP-100518-1 (ng/L)	RPD (%)
1,4-Dioxane	0.092 J	0.095 J	3.2
Perfluorobutanoic acid (PFBA)	97.3	80.0	19.5
Perfluoropentanoic (PFPeA)	28.9	36.1	22.2
Perfluorohexanoic acid (PFHxA)	11.0	12.0	8.7
Perfluoroheptanoic acid (PFHpA)	15.2	16.1	5.8
Perfluorooctanoic acid (PFOA)	107	97.4	9.4
Perfluorononanoic acid (PFNA)	2.60	2.59	0.4
Perfluorodecanoic acid (PFDA)	0.43 J	0.58 J	29.7
Perfluorobutanesulfonic acid (PFBS)	6.66	6.18	7.5
Perfluorohexanesulfonic acid(PFHxS)	12.9	11.1	15.0
Perfluoroheptanesulfonic Acid (PFHpS)	1.27 J	1.54 J	19.2
Perfluorooctanesulfonic acid (PFOS)	87.3	88.0	0.8
Perfluorooctanesulfonamide (FOSA)	2.67	2.81	5.1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.11 J	3.72 J	10.0
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
MW-18	A 3-fold dilution was performed for Perfluoroheptanoic acid (PFHpA), Perfluorooctanoic acid (PFOA), and Perfluorohexanesulfonic acid (PFHxS) due to sample matrix. All other results were reported from the undiluted analysis.
MW-2	A 5-fold dilution was performed due to sample matrix. RLs were elevated in this sample.

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Sample	PFAS Analysis Reported
MW-16	A 10-fold dilution was performed for Perfluoropentanoic acid (PFPeA), Perfluoroheptanoic acid (PFHpA), Perfluorooctanoic acid (PFOA), and Perfluorohexanesulfonic acid (PFHxS). All other results were reported from the 5-fold dilution analysis. RLs were elevated in this sample.
DUP-100518-1	A 3-fold dilution was performed for Perfluoroheptanoic acid (PFHpA), Perfluorooctanoic acid (PFOA), and Perfluorohexanesulfonic acid (PFHxS) due to sample matrix. All other results were reported from the undiluted analysis.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample ID: MW-18
Date Collected: 10/05/18 08:10
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.092	J	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 15:15	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	48		10 - 150	10/09/18 20:13	10/10/18 15:15	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	97.3	J	1.94	0.40	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluoropentanoic acid (PFPeA)	28.9		1.94	0.73	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorohexanoic acid (PFHxA)	11.0		1.94	0.23	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluoroheptanoic acid (PFHpA)	15.2		5.82	0.93	ng/L		10/18/18 13:58	10/22/18 14:20	3
Perfluorooctanoic acid (PFOA)	107	B	5.82	0.93	ng/L		10/18/18 13:58	10/22/18 14:20	3
Perfluorononanoic acid (PFNA)	2.60		1.94	0.37	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorodecanoic acid (PFDA)	0.43	J	1.94	0.37	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluoroundecanoic acid (PFUnA)	~~0.34~~ J B 1.94U		1.94	0.24	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorododecanoic acid (PFDoA)	1.94 U		1.94	0.34	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorotridecanoic acid (PFTriA)	1.94 U		1.94	0.23	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorotetradecanoic acid (PFTeA)	1.94 U		1.94	0.44	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorobutanesulfonic acid (PFBS)	6.66		1.94	0.43	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorohexanesulfonic acid (PFHxS)	12.9		5.82	0.76	ng/L		10/18/18 13:58	10/22/18 14:20	3
Perfluoroheptanesulfonic Acid (PFHpS)	1.27	J	1.94	0.80	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorooctanesulfonic acid (PFOS)	87.3		1.94	0.74	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorodecanesulfonic acid (PFDS)	1.94 U		1.94	0.51	ng/L		10/18/18 13:58	10/21/18 15:42	1
Perfluorooctanesulfonamide (FOSA)	2.67		1.94	0.54	ng/L		10/18/18 13:58	10/21/18 15:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19.4 U		19.4	0.44	ng/L		10/18/18 13:58	10/21/18 15:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.11	J	19.4	0.68	ng/L		10/18/18 13:58	10/21/18 15:42	1
6:2 FTS	19.4 U		19.4	0.97	ng/L		10/18/18 13:58	10/21/18 15:42	1
8:2 FTS	19.4 U		19.4	0.54	ng/L		10/18/18 13:58	10/21/18 15:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	16	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C5-PFPeA DNU	31		25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C2 PFHxA	41		25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C4 PFHpA	69		25 - 150	10/18/18 13:58	10/22/18 14:20	3
13C4 PFOA	88		25 - 150	10/18/18 13:58	10/22/18 14:20	3
13C5 PFNA	122		25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C2 PFDA	142		25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C2 PFUnA	159	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C2 PFDoA	156	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C2 PFTeDA	168	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C3 PFBS	73		25 - 150	10/18/18 13:58	10/21/18 15:42	1
18O2 PFHxS	89		25 - 150	10/18/18 13:58	10/22/18 14:20	3
13C4 PFOS	145		25 - 150	10/18/18 13:58	10/21/18 15:42	1
13C8 FOSA	102		25 - 150	10/18/18 13:58	10/21/18 15:42	1
d3-NMeFOSAA	148		25 - 150	10/18/18 13:58	10/21/18 15:42	1

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Dan 11/13/18

Client Sample ID: MW-18
Date Collected: 10/05/18 08:10
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	201	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1
M2-6:2 FTS	480	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1
M2-8:2 FTS	310	*	25 - 150	10/18/18 13:58	10/21/18 15:42	1

Client Sample ID: MW-2
Date Collected: 10/05/18 09:00
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.63		0.21	0.017	ug/L		10/09/18 20:13	10/10/18 15:33	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	51		10 - 150	10/09/18 20:13	10/10/18 15:33	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**51.6**		8.56	1.76	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluoropentanoic acid (PFPeA)	**56.5**		8.56	3.21	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorohexanoic acid (PFHxA)	**43.5**		8.56	1.03	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluoroheptanoic acid (PFHpA)	**22.8**		8.56	1.37	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorooctanoic acid (PFOA)	**137**	B	8.56	1.37	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorononanoic acid (PFNA)	**11.6**		8.56	1.63	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorodecanoic acid (PFDA)	8.56	U	8.56	1.63	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluoroundecanoic acid (PFUnA)	8.56	U	8.56	1.07	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorododecanoic acid (PFDoA)	8.56	U	8.56	1.50	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorotridecanoic acid (PFTriA)	8.56	U	8.56	1.03	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorotetradecanoic acid (PFTeA)	8.56	U	8.56	1.93	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorobutanesulfonic acid (PFBS)	**7.33**	J	8.56	1.88	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorohexanesulfonic acid (PFHxS)	**18.9**		8.56	1.11	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluoroheptanesulfonic Acid (PFHpS)	8.56	U	8.56	3.51	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorooctanesulfonic acid (PFOS)	**45.6**		8.56	3.25	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorodecanesulfonic acid (PFDS)	8.56	U	8.56	2.27	ng/L		10/18/18 13:58	10/22/18 14:36	5
Perfluorooctanesulfonamide (FOSA)	8.56	U	8.56	2.40	ng/L		10/18/18 13:58	10/22/18 14:36	5
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	85.6	U	85.6	1.93	ng/L		10/18/18 13:58	10/22/18 14:36	5
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	85.6	U	85.6	3.00	ng/L		10/18/18 13:58	10/22/18 14:36	5
6:2 FTS	85.6	U	85.6	4.28	ng/L		10/18/18 13:58	10/22/18 14:36	5
8:2 FTS	85.6	U	85.6	2.40	ng/L		10/18/18 13:58	10/22/18 14:36	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	25		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C5-PFPeA DNU	66		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C2 PFHxA	47		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C4 PFHpA	78		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C4 PFOA	99		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C5 PFNA	104		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C2 PFDA	119		25 - 150	10/18/18 13:58	10/22/18 14:36	5

DRAFT

Client Sample ID: MW-2
Date Collected: 10/05/18 09:00
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	114		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C2 PFDoA	97		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C2 PFTeDA	97		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C3 PFBS	72		25 - 150	10/18/18 13:58	10/22/18 14:36	5
18O2 PFHxS	88		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C4 PFOS	86		25 - 150	10/18/18 13:58	10/22/18 14:36	5
13C8 FOSA	72		25 - 150	10/18/18 13:58	10/22/18 14:36	5
d3-NMeFOSAA	89		25 - 150	10/18/18 13:58	10/22/18 14:36	5
d5-NEtFOSAA	124		25 - 150	10/18/18 13:58	10/22/18 14:36	5
M2-6:2 FTS	235	*	25 - 150	10/18/18 13:58	10/22/18 14:36	5
M2-8:2 FTS	125		25 - 150	10/18/18 13:58	10/22/18 14:36	5

Client Sample ID: MW-16
Date Collected: 10/05/18 08:05
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.24		0.20	0.016	ug/L		10/09/18 20:13	10/10/18 15:50	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	48		10 - 150	10/09/18 20:13	10/10/18 15:50	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**276**		8.52	1.75	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluoropentanoic acid (PFPeA)	**68.5**		17.0	6.39	ng/L		10/18/18 13:58	10/22/18 14:52	10
Perfluorohexanoic acid (PFHxA)	**44.0**		8.52	1.02	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluoroheptanoic acid (PFHpA)	**50.9**		17.0	2.73	ng/L		10/18/18 13:58	10/22/18 14:52	10
Perfluorooctanoic acid (PFOA)	**487**	B	17.0	2.73	ng/L		10/18/18 13:58	10/22/18 14:52	10
Perfluorononanoic acid (PFNA)	**11.7**		8.52	1.62	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorodecanoic acid (PFDA)	8.52	U	8.52	1.62	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluoroundecanoic acid (PFUnA)	8.52	U	8.52	1.07	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorododecanoic acid (PFDoA)	8.52	U	8.52	1.49	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorotridecanoic acid (PFTriA)	8.52	U	8.52	1.02	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorotetradecanoic acid (PFTeA)	8.52	U	8.52	1.92	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorobutanesulfonic acid (PFBS)	**27.5**		8.52	1.87	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorohexanesulfonic acid (PFHxS)	**181**		17.0	2.22	ng/L		10/18/18 13:58	10/22/18 14:52	10
Perfluoroheptanesulfonic Acid (PFHpS)	**33.4**		8.52	3.49	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorooctanesulfonic acid (PFOS)	**898**		8.52	3.24	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorodecanesulfonic acid (PFDS)	8.52	U	8.52	2.26	ng/L		10/18/18 13:58	10/22/18 15:56	5
Perfluorooctanesulfonamide (FOSA)	8.52	U	8.52	2.39	ng/L		10/18/18 13:58	10/22/18 15:56	5
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	85.2	U	85.2	1.92	ng/L		10/18/18 13:58	10/22/18 15:56	5
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**5.29**	J	85.2	2.98	ng/L		10/18/18 13:58	10/22/18 15:56	5
6:2 FTS	85.2	U	85.2	4.26	ng/L		10/18/18 13:58	10/22/18 15:56	5
8:2 FTS	85.2	U	85.2	2.39	ng/L		10/18/18 13:58	10/22/18 15:56	5

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Client Sample ID: MW-16

Date Collected: 10/05/18 08:05
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	28		25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C5-PFPeA DNU	54		25 - 150	10/18/18 13:58	10/22/18 14:52	10
13C2 PFHxA	51		25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C4 PFHpA	68		25 - 150	10/18/18 13:58	10/22/18 14:52	10
13C4 PFOA	85		25 - 150	10/18/18 13:58	10/22/18 14:52	10
13C5 PFNA	136		25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C2 PFDA	151	*	25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C2 PFUnA	183	*	25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C2 PFDoA	146		25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C2 PFTeDA	146		25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C3 PFBS	114		25 - 150	10/18/18 13:58	10/22/18 15:56	5
18O2 PFHxS	83		25 - 150	10/18/18 13:58	10/22/18 14:52	10
13C4 PFOS	143		25 - 150	10/18/18 13:58	10/22/18 15:56	5
13C8 FOSA	88		25 - 150	10/18/18 13:58	10/22/18 15:56	5
d3-NMeFOSAA	135		25 - 150	10/18/18 13:58	10/22/18 15:56	5
d5-NEtFOSAA	208	*	25 - 150	10/18/18 13:58	10/22/18 15:56	5
M2-6:2 FTS	386	*	25 - 150	10/18/18 13:58	10/22/18 15:56	5
M2-8:2 FTS	260	*	25 - 150	10/18/18 13:58	10/22/18 15:56	5

Client Sample ID: DUP-100518-1

Date Collected: 10/05/18 00:00
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.095	J	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 16:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	54		10 - 150	10/09/18 20:13	10/10/18 16:42	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	80.0	J	1.94	0.40	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluoropentanoic acid (PFPeA)	36.1	J	1.94	0.73	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorohexanoic acid (PFHxA)	12.0		1.94	0.23	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluoroheptanoic acid (PFHpA)	16.1		5.83	0.93	ng/L		10/18/18 13:58	10/22/18 15:40	3
Perfluorooctanoic acid (PFOA)	97.4	B	5.83	0.93	ng/L		10/18/18 13:58	10/22/18 15:40	3
Perfluorononanoic acid (PFNA)	2.59		1.94	0.37	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorodecanoic acid (PFDA)	0.58	J	1.94	0.37	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluoroundecanoic acid (PFUnA)	~~0.45 J B~~ 1.94U		1.94	0.24	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorododecanoic acid (PFDoA)	1.94 U		1.94	0.34	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorotridecanoic acid (PFTriA)	1.94 U		1.94	0.23	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorotetradecanoic acid (PFTeA)	1.94 U		1.94	0.44	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorobutanesulfonic acid (PFBS)	6.18		1.94	0.43	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorohexanesulfonic acid (PFHxS)	11.1		5.83	0.76	ng/L		10/18/18 13:58	10/22/18 15:40	3
Perfluoroheptanesulfonic Acid (PFHpS)	1.54	J	1.94	0.80	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorooctanesulfonic acid (PFOS)	88.0		1.94	0.74	ng/L		10/18/18 13:58	10/21/18 17:18	1
Perfluorodecanesulfonic acid (PFDS)	1.94 U		1.94	0.52	ng/L		10/18/18 13:58	10/21/18 17:18	1

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Client Sample ID: DUP-100518-1

Date Collected: 10/05/18 00:00
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (FOSA)	**2.81**		1.94	0.54	ng/L		10/18/18 13:58	10/21/18 17:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19.4	U	19.4	0.44	ng/L		10/18/18 13:58	10/21/18 17:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**3.72**	J	19.4	0.68	ng/L		10/18/18 13:58	10/21/18 17:18	1
6:2 FTS	19.4	U	19.4	0.97	ng/L		10/18/18 13:58	10/21/18 17:18	1
8:2 FTS	19.4	U	19.4	0.54	ng/L		10/18/18 13:58	10/21/18 17:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*17*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C5-PFPeA DNU	*22*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C2 PFHxA	*37*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C4 PFHpA	*67*		*25 - 150*	*10/18/18 13:58*	*10/22/18 15:40*	*3*
13C4 PFOA	*97*		*25 - 150*	*10/18/18 13:58*	*10/22/18 15:40*	*3*
13C5 PFNA	*122*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C2 PFDA	*149*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C2 PFUnA	*166*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C2 PFDoA	*163*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C2 PFTeDA	*175*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C3 PFBS	*82*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
18O2 PFHxS	*85*		*25 - 150*	*10/18/18 13:58*	*10/22/18 15:40*	*3*
13C4 PFOS	*141*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
13C8 FOSA	*94*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
d3-NMeFOSAA	*142*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
d5-NEtFOSAA	*198*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
M2-6:2 FTS	*420*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*
M2-8:2 FTS	*320*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:18*	*1*

Client Sample ID: FB-100518-1

Date Collected: 10/05/18 07:25
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 17:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*51*		*10 - 150*	*10/09/18 20:13*	*10/10/18 17:00*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.60	U	1.60	0.33	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluoropentanoic acid (PFPeA)	1.60	U	1.60	0.60	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorohexanoic acid (PFHxA)	1.60	U	1.60	0.19	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluoroheptanoic acid (PFHpA)	1.60	U	1.60	0.26	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorooctanoic acid (PFOA)	1.60	U	1.60	0.26	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorononanoic acid (PFNA)	1.60	U	1.60	0.30	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorodecanoic acid (PFDA)	1.60	U	1.60	0.30	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluoroundecanoic acid (PFUnA)	~~0.22 J B~~ 1.60U		1.60	0.20	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorododecanoic acid (PFDoA)	1.60	U	1.60	0.28	ng/L		10/18/18 13:58	10/21/18 17:34	1

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Client Sample ID: FB-100518-1
Date Collected: 10/05/18 07:25
Date Received: 10/05/18 18:00

Lab Sample ID: 460-166356-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid (PFTriA)	1.60	U	1.60	0.19	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorotetradecanoic acid (PFTeA)	1.60	U	1.60	0.36	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorobutanesulfonic acid (PFBS)	1.60	U	1.60	0.35	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorohexanesulfonic acid (PFHxS)	1.60	U	1.60	0.21	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.60	U	1.60	0.66	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorooctanesulfonic acid (PFOS)	1.60	U	1.60	0.61	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorodecanesulfonic acid (PFDS)	1.60	U	1.60	0.42	ng/L		10/18/18 13:58	10/21/18 17:34	1
Perfluorooctanesulfonamide (FOSA)	1.60	U	1.60	0.45	ng/L		10/18/18 13:58	10/21/18 17:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.0	U	16.0	0.36	ng/L		10/18/18 13:58	10/21/18 17:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.0	U	16.0	0.56	ng/L		10/18/18 13:58	10/21/18 17:34	1
6:2 FTS	16.0	U	16.0	0.80	ng/L		10/18/18 13:58	10/21/18 17:34	1
8:2 FTS	16.0	U	16.0	0.45	ng/L		10/18/18 13:58	10/21/18 17:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*83*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C5-PFPeA DNU	*108*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C2 PFHxA	*108*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C4 PFHpA	*97*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C4 PFOA	*102*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C5 PFNA	*99*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C2 PFDA	*99*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C2 PFUnA	*103*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C2 PFDoA	*101*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C2 PFTeDA	*91*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C3 PFBS	*96*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C4 PFOS	*106*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
13C8 FOSA	*56*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
d3-NMeFOSAA	*86*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
d5-NEtFOSAA	*93*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
M2-6:2 FTS	*158*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*
M2-8:2 FTS	*99*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:34*	*1*

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Chain of Custody Record

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THE LEADER IN ENVIRONMENTAL TESTING

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Company: GEI Consultants, Inc.				Job #: 166356
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:			
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.10			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Coney Is-PFAS-1803556-1.10	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
		0810	Preservation Code:			N	N		
MW-18	10/5/18	0805	G	Water	N			4	
MW-2	10/5/18	0900	G	Water	N			4	
MW-16	10/5/18	0805	G	Water	N			12	MS/MSD
DUP-100518-1	10/5/18	—	G	Water	N	N		4	
FB-100518-1	10/5/18	0725	G	Water	N	N		4	

460-166356 Chain of Custody

DRAFT

Possible Hazard Identification
x 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 x Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:		
Relinquished by: Craig Hayes	Date/Time: 10/5/18 1315	Company: GEI	Received by:	Date/Time: 10/5/18 1345	Company: T-A	
Relinquished by:	Date/Time: 10/5/18 18:00	Company: T-A	Received by:	Date/Time: 10/6/18 0800	Company:	
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:	

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

Cooler Temperature(s) °C and Other Remarks:

3.0 / 3.0 3.2 / 3.2 ERA 7

Ver: 08/04/2016

Site: Long Island Emerging Contaminants, Fulton
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166804
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
FW-MW-19	460-166804-01	PFAS, 1,4-Dioxane
FW-MW-5R	460-166804-02	PFAS, 1,4-Dioxane
FW-MW-04	460-166804-03	PFAS, 1,4-Dioxane
FW-MW-17	460-166804-04	PFAS, 1,4-Dioxane
DUP-101118	460-166804-05	PFAS, 1,4-Dioxane
FB-101118	460-166804-06	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-101118
Field Duplicate pair: FW-MW-19/DUP-101118

The above-listed aqueous samples and field blank sample were collected on October 11, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

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In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

1,4-Dioxane and PFAS

Analytes were detected in the associated laboratory method and field blank samples. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane				
1,4-Dioxane	FB-101118: All samples	0.11 ug/L	1.1 ug/L	Qualify the results for 1,4-dioxane in samples FW-MW-19, FW-MW-5R, and DUP-101118 as nondetect (U) at the RL.
PFAS				
Perfluoroundecanoic acid (PFUnA)	Method MB 200-135487: All samples	0.319 ng/L	3.19 ng/L	Qualify the results for Perfluoroundecanoic acid (PFUnA) in samples FW-MW-19, FW-MW-5R, FW-MW-04, FW-MW-17, and DUP-101118 as nondetect (U) at the RL.
Perfluorooctanoic acid (PFOA)	FB-101118: All samples	0.41 ng/L	4.1 ng/L	Validation actions were not required.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

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Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
FW-MW-17	13C4 PFBA	20	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample FW-MW-17.
	M2-6:2 FTS	395		
	M2-8:2 FTS	311		Validation action was not required as the results for 8:2 FTS, NEtFOSAA, PFDoA, PFTriA, PFTeDA, and PFUnA were not detected in this sample and therefore not affected by the high recoveries.
	D5-NetFOSAA	196		
	13C2 PFUnA	165		
	13C2 PFDoA	183		
	13C2 PFTeDA	175		
FW-MW-19	M2-6:2 FTS	253	25-150	Estimate (J) the positive results for 6:2 FTS, Perfluorododecanoic acid (PFDoA), and Perfluorotridecanoic acid (PFTriA) in sample FW-MW-19.
	13C2 PFDoA	156		
	M2-8:2 FTS	186		Validation action was not required as the results for 8:2 FTS and PFTeA were not detected in this sample and therefore not affected by the high recoveries.
	13C2 PFTeDA	156		
FW-MW-5R	M2-6:2 FTS	296	25-150	Estimate (J) the positive result for 6:2 FTS in sample FW-MW-5R.
FW-MW-04	13C4 PFBA	17	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample FW-MW-04.
	M2-6:2 FTS	308		
	M2-8:2 FTS	183		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
DUP-101118	13C4 PFBA	23	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample DUP-101118.
	M2-6:2 FTS	267		
	M2-8:2 FTS	184		Validation action was not required as the results for 8:2 FTS and PFTeA were not detected in this sample and therefore not affected by the high recoveries.
	13C2 PFTeDA	151		

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It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample FW-MW-17 for 1,4-dioxane and PFAS. Recovery criteria were met for analytes which were detected at levels less than four times the matrix spike. Precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples FW-MW-19 and DUP-101118 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria except for Perfluorobutanesulfonic acid (PFBS). The positive results for Perfluorobutanesulfonic acid in samples FW-MW-19 and DUP-101118 were qualified as estimated (J). The direction of bias cannot be determined from this nonconformance.

Analyte	FW-MW-19 (ng/L)	DUP-101118 (ng/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	52.0	53.7	3.2
Perfluoropentanoic (PFPeA)	80.4	71.8	11.3
Perfluorohexanoic acid (PFHxA)	106	100	5.8
Perfluoroheptanoic acid (PFHpA)	292	261	11.2
Perfluorooctanoic acid (PFOA)	115	103	11.0
Perfluorononanoic acid (PFNA)	8.62	8.07	6.6
Perfluorodecanoic acid (PFDA)	0.49 J	0.32 J	42.0, Within the RL
Perfluorododecanoic acid (PFDoA)	0.38 J	1.62 U	NC, Within the RL
Perfluorotridecanoic acid (PFTriA)	0.21 J	1.62 U	NC, Within the RL
Perfluorobutanesulfonic acid (PFBS)	2.03	4.00	**65.3**
Perfluorohexanesulfonic acid(PFHxS)	1.46 J	1.89	25.7
Perfluorooctanesulfonic acid (PFOS)	6.92	6.79	1.9
Perfluorodecanesulfonic acid (PFDS)	0.58 J	1.62 U	NC, Within the RL
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.39 J	16.2 U	NC, Within the RL
6:2 FTS	4.41 J	6.92 J	44.3, Within the RL

NC – Not calculable
Criteria: When both results are ≥5x the RL, RPDs must be <30%.
When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

DRAFT

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
FW-MW-17	A 5-fold dilution was performed for Perfluoroheptanoic acid (PFHpA) and Perfluorohexanesulfonic acid (PFHxS) to reduce matrix effect. All other results were reported from the undiluted analysis.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Fulton-PFAS-1803556-1.16

TestAmerica Job ID: 460-166804-1

Client Sample ID: FW-MW-19
Date Collected: 10/11/18 10:15
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.17~~	~~J~~ 0.20U	0.20	0.016	ug/L		10/14/18 09:11	10/15/18 00:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*38*		*10 - 150*	*10/14/18 09:11*	*10/15/18 00:51*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**52.0**		1.62	0.33	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluoropentanoic acid (PFPeA)	**80.4**		1.62	0.61	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorohexanoic acid (PFHxA)	**106**		1.62	0.19	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluoroheptanoic acid (PFHpA)	**292**		1.62	0.26	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorooctanoic acid (PFOA)	**115**		1.62	0.26	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorononanoic acid (PFNA)	**8.62**		1.62	0.31	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorodecanoic acid (PFDA)	**0.49**	J	1.62	0.31	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluoroundecanoic acid (PFUnA)	~~**0.61**~~	~~J B~~ 1.62U	1.62	0.20	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorododecanoic acid (PFDoA)	**0.38**	J	1.62	0.28	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorotridecanoic acid (PFTriA)	**0.21**	J	1.62	0.19	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorotetradecanoic acid (PFTeA)	1.62	U	1.62	0.37	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorobutanesulfonic acid (PFBS)	**2.03**	J.	1.62	0.36	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorohexanesulfonic acid (PFHxS)	**1.46**	J	1.62	0.21	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.62	U	1.62	0.67	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorooctanesulfonic acid (PFOS)	**6.92**		1.62	0.62	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorodecanesulfonic acid (PFDS)	**0.58**	J	1.62	0.43	ng/L		10/19/18 11:40	10/22/18 00:12	1
Perfluorooctanesulfonamide (FOSA)	1.62	U	1.62	0.45	ng/L		10/19/18 11:40	10/22/18 00:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**0.39**	J	16.2	0.37	ng/L		10/19/18 11:40	10/22/18 00:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2	U	16.2	0.57	ng/L		10/19/18 11:40	10/22/18 00:12	1
6:2 FTS	**4.41**	J	16.2	0.81	ng/L		10/19/18 11:40	10/22/18 00:12	1
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/19/18 11:40	10/22/18 00:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*26*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C5-PFPeA DNU	*48*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C2 PFHxA	*59*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C4 PFHpA	*74*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C4 PFOA	*95*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C5 PFNA	*125*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C2 PFDA	*129*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C2 PFUnA	*144*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C2 PFDoA	*156*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C2 PFTeDA	*156*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
18O2 PFHxS	*96*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*
13C4 PFOS	*128*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:12*	*1*

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11/15/18

Client Sample ID: FW-MW-19

Date Collected: 10/11/18 10:15
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	79		25 - 150	10/19/18 11:40	10/22/18 00:12	1
d3-NMeFOSAA	106		25 - 150	10/19/18 11:40	10/22/18 00:12	1
d5-NEtFOSAA	139		25 - 150	10/19/18 11:40	10/22/18 00:12	1
M2-6:2 FTS	253	*	25 - 150	10/19/18 11:40	10/22/18 00:12	1
M2-8:2 FTS	186	*	25 - 150	10/19/18 11:40	10/22/18 00:12	1

Client Sample ID: FW-MW-5R

Date Collected: 10/11/18 11:55
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.15~~	~~J~~ 0.20U	0.20	0.016	ug/L		10/14/18 09:11	10/15/18 01:08	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	38		10 - 150	10/14/18 09:11	10/15/18 01:08	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	13.0		1.60	0.33	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluoropentanoic acid (PFPeA)	3.33		1.60	0.60	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorohexanoic acid (PFHxA)	3.41		1.60	0.19	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluoroheptanoic acid (PFHpA)	4.76		1.60	0.26	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorooctanoic acid (PFOA)	36.9		1.60	0.26	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorononanoic acid (PFNA)	0.43	J	1.60	0.30	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorodecanoic acid (PFDA)	1.60	U	1.60	0.30	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluoroundecanoic acid (PFUnA)	~~0.27~~	~~J B~~ 1.60U	1.60	0.20	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorododecanoic acid (PFDoA)	1.60	U	1.60	0.28	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorotridecanoic acid (PFTriA)	1.60	U	1.60	0.19	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorotetradecanoic acid (PFTeA)	1.60	U	1.60	0.36	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorobutanesulfonic acid (PFBS)	2.33		1.60	0.35	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorohexanesulfonic acid (PFHxS)	0.36	J	1.60	0.21	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.60	U	1.60	0.66	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorooctanesulfonic acid (PFOS)	1.60	U	1.60	0.61	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorodecanesulfonic acid (PFDS)	1.60	U	1.60	0.42	ng/L		10/19/18 11:40	10/22/18 00:28	1
Perfluorooctanesulfonamide (FOSA)	1.60	U	1.60	0.45	ng/L		10/19/18 11:40	10/22/18 00:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.0	U	16.0	0.36	ng/L		10/19/18 11:40	10/22/18 00:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.0	U	16.0	0.56	ng/L		10/19/18 11:40	10/22/18 00:28	1
6:2 FTS	1.15	J	16.0	0.80	ng/L		10/19/18 11:40	10/22/18 00:28	1
8:2 FTS	16.0	U	16.0	0.45	ng/L		10/19/18 11:40	10/22/18 00:28	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	28		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C5-PFPeA DNU	55		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C2 PFHxA	60		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C4 PFHpA	75		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C4 PFOA	91		25 - 150	10/19/18 11:40	10/22/18 00:28	1

DRAFT

Client Sample ID: FW-MW-5R

Date Collected: 10/11/18 11:55
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	110		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C2 PFDA	110		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C2 PFUnA	111		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C2 PFDoA	114		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C2 PFTeDA	115		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C3 PFBS	71		25 - 150	10/19/18 11:40	10/22/18 00:28	1
18O2 PFHxS	91		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C4 PFOS	102		25 - 150	10/19/18 11:40	10/22/18 00:28	1
13C8 FOSA	54		25 - 150	10/19/18 11:40	10/22/18 00:28	1
d3-NMeFOSAA	87		25 - 150	10/19/18 11:40	10/22/18 00:28	1
d5-NEtFOSAA	104		25 - 150	10/19/18 11:40	10/22/18 00:28	1
M2-6:2 FTS	296	*	25 - 150	10/19/18 11:40	10/22/18 00:28	1
M2-8:2 FTS	139		25 - 150	10/19/18 11:40	10/22/18 00:28	1

Client Sample ID: FW-MW-04

Date Collected: 10/11/18 11:05
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/14/18 09:11	10/15/18 01:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	41		10 - 150	10/14/18 09:11	10/15/18 01:26	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	36.1	J.	1.61	0.33	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluoropentanoic acid (PFPeA)	21.2		1.61	0.60	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorohexanoic acid (PFHxA)	11.3		1.61	0.19	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluoroheptanoic acid (PFHpA)	12.3		1.61	0.26	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorooctanoic acid (PFOA)	135		1.61	0.26	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorononanoic acid (PFNA)	2.82		1.61	0.31	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorodecanoic acid (PFDA)	1.61	U	1.61	0.31	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluoroundecanoic acid (PFUnA)	~~0.22~~	~~J B~~ 1.61 U.	1.61	0.20	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorododecanoic acid (PFDoA)	1.61	U	1.61	0.28	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorotridecanoic acid (PFTriA)	1.61	U	1.61	0.19	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorotetradecanoic acid (PFTeA)	1.61	U	1.61	0.36	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorobutanesulfonic acid (PFBS)	9.44		1.61	0.35	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorohexanesulfonic acid (PFHxS)	2.99		1.61	0.21	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.12	J.	1.61	0.66	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorooctanesulfonic acid (PFOS)	34.8		1.61	0.61	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorodecanesulfonic acid (PFDS)	1.61	U	1.61	0.43	ng/L		10/19/18 11:40	10/22/18 00:44	1
Perfluorooctanesulfonamide (FOSA)	1.61	U	1.61	0.45	ng/L		10/19/18 11:40	10/22/18 00:44	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.1	U	16.1	0.36	ng/L		10/19/18 11:40	10/22/18 00:44	1

DRAFT

Client Sample ID: FW-MW-04

Date Collected: 10/11/18 11:05
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.1	U	16.1	0.56	ng/L		10/19/18 11:40	10/22/18 00:44	1
6:2 FTS	**3.35**	J	16.1	0.81	ng/L		10/19/18 11:40	10/22/18 00:44	1
8:2 FTS	16.1	U	16.1	0.45	ng/L		10/19/18 11:40	10/22/18 00:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*17*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C5-PFPeA DNU	*34*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C2 PFHxA	*43*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C4 PFHpA	*69*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C4 PFOA	*93*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C5 PFNA	*114*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C2 PFDA	*131*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C2 PFUnA	*128*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C2 PFDoA	*137*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C2 PFTeDA	*125*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C3 PFBS	*81*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
18O2 PFHxS	*102*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C4 PFOS	*118*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
13C8 FOSA	*73*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
d3-NMeFOSAA	*108*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
d5-NEtFOSAA	*122*		*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
M2-6:2 FTS	*308*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*
M2-8:2 FTS	*183*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 00:44*	*1*

Client Sample ID: FW-MW-17

Date Collected: 10/11/18 09:00
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/14/18 09:11	10/14/18 23:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*39*		*10 - 150*	*10/14/18 09:11*	*10/14/18 23:25*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**83.9**	J	1.61	0.33	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluoropentanoic acid (PFPeA)	**53.1**		1.61	0.60	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorohexanoic acid (PFHxA)	**31.2**		1.61	0.19	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluoroheptanoic acid (PFHpA)	**49.5**		8.06	1.29	ng/L		10/19/18 11:40	10/22/18 19:07	5
Perfluorooctanoic acid (PFOA)	**221**		1.61	0.26	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorononanoic acid (PFNA)	**4.60**		1.61	0.31	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorodecanoic acid (PFDA)	**0.43**	J	1.61	0.31	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluoroundecanoic acid (PFUnA)	~~**0.28**~~	~~J B~~ 1.61U	1.61	0.20	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorododecanoic acid (PFDoA)	1.61	U	1.61	0.28	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorotridecanoic acid (PFTriA)	1.61	U	1.61	0.19	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorotetradecanoic acid (PFTeA)	1.61	U	1.61	0.36	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorobutanesulfonic acid (PFBS)	**10.7**		1.61	0.35	ng/L		10/19/18 11:40	10/22/18 01:00	1

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Client Sample ID: FW-MW-17
Date Collected: 10/11/18 09:00
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**1.16**	J ·	8.06	1.05	ng/L		10/19/18 11:40	10/22/18 19:07	5
Perfluoroheptanesulfonic Acid (PFHpS)	1.61	U	1.61	0.66	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorooctanesulfonic acid (PFOS)	**13.3**		1.61	0.61	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorodecanesulfonic acid (PFDS)	1.61	U	1.61	0.43	ng/L		10/19/18 11:40	10/22/18 01:00	1
Perfluorooctanesulfonamide (FOSA)	1.61	U	1.61	0.45	ng/L		10/19/18 11:40	10/22/18 01:00	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.1	U	16.1	0.36	ng/L		10/19/18 11:40	10/22/18 01:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.1	U	16.1	0.56	ng/L		10/19/18 11:40	10/22/18 01:00	1
6:2 FTS	**11.0**	J ·	16.1	0.81	ng/L		10/19/18 11:40	10/22/18 01:00	1
8:2 FTS	16.1	U	16.1	0.45	ng/L		10/19/18 11:40	10/22/18 01:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*20*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C5-PFPeA DNU	*29*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C2 PFHxA	*34*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/19/18 11:40*	*10/22/18 19:07*	*5*
13C4 PFOA	*94*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C5 PFNA	*130*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C2 PFDA	*146*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C2 PFUnA	*165*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C2 PFDoA	*183*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C2 PFTeDA	*175*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C3 PFBS	*60*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
18O2 PFHxS	*86*		*25 - 150*	*10/19/18 11:40*	*10/22/18 19:07*	*5*
13C4 PFOS	*139*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
13C8 FOSA	*94*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
d3-NMeFOSAA	*135*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
d5-NEtFOSAA	*196*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
M2-6:2 FTS	*395*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*
M2-8:2 FTS	*311*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:00*	*1*

Client Sample ID: DUP-101118
Date Collected: 10/11/18 00:00
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.15~~ ~~J~~ 0.20 U ·		0.20	0.016	ug/L		10/14/18 09:11	10/15/18 01:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*41*		*10 - 150*	*10/14/18 09:11*	*10/15/18 01:43*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**53.7**	J ·	1.62	0.33	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluoropentanoic acid (PFPeA)	**71.8**		1.62	0.61	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorohexanoic acid (PFHxA)	**100**		1.62	0.19	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluoroheptanoic acid (PFHpA)	**261**		1.62	0.26	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorooctanoic acid (PFOA)	**103**		1.62	0.26	ng/L		10/19/18 11:40	10/22/18 01:48	1

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Client Sample ID: DUP-101118

Date Collected: 10/11/18 00:00
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**8.07**		1.62	0.31	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorodecanoic acid (PFDA)	**0.32**	J	1.62	0.31	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluoroundecanoic acid (PFUnA)	~~0.37~~	~~J B~~ 1.62U	1.62	0.20	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorododecanoic acid (PFDoA)	1.62	U	1.62	0.28	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorotridecanoic acid (PFTriA)	1.62	U	1.62	0.19	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorotetradecanoic acid (PFTeA)	1.62	U	1.62	0.37	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorobutanesulfonic acid (PFBS)	**4.00**	J	1.62	0.36	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorohexanesulfonic acid (PFHxS)	**1.89**		1.62	0.21	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.62	U	1.62	0.67	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorooctanesulfonic acid (PFOS)	**6.79**		1.62	0.62	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorodecanesulfonic acid (PFDS)	1.62	U	1.62	0.43	ng/L		10/19/18 11:40	10/22/18 01:48	1
Perfluorooctanesulfonamide (FOSA)	1.62	U	1.62	0.45	ng/L		10/19/18 11:40	10/22/18 01:48	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.2	U	16.2	0.37	ng/L		10/19/18 11:40	10/22/18 01:48	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.2	U	16.2	0.57	ng/L		10/19/18 11:40	10/22/18 01:48	1
6:2 FTS	**6.92**	J	16.2	0.81	ng/L		10/19/18 11:40	10/22/18 01:48	1
8:2 FTS	16.2	U	16.2	0.45	ng/L		10/19/18 11:40	10/22/18 01:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*23*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C5-PFPeA DNU	*46*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C2 PFHxA	*55*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C4 PFHpA	*74*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C4 PFOA	*97*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C5 PFNA	*126*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C2 PFDA	*134*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C2 PFUnA	*145*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C2 PFDoA	*145*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C2 PFTeDA	*151*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C3 PFBS	*74*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
18O2 PFHxS	*101*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C4 PFOS	*125*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
13C8 FOSA	*76*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
d3-NMeFOSAA	*97*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
d5-NEtFOSAA	*136*		*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
M2-6:2 FTS	*267*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*
M2-8:2 FTS	*184*	*	*25 - 150*	*10/19/18 11:40*	*10/22/18 01:48*	*1*

Client Sample ID: FB-101118

Date Collected: 10/11/18 11:15
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-6
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.11**	J	0.20	0.016	ug/L		10/14/18 09:11	10/15/18 02:00	1

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Client Sample ID: FB-101118
Date Collected: 10/11/18 11:15
Date Received: 10/12/18 20:00

Lab Sample ID: 460-166804-6
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	33		10 - 150	10/14/18 09:11	10/15/18 02:00	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.81	U	1.81	0.37	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluoropentanoic acid (PFPeA)	1.81	U	1.81	0.68	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorohexanoic acid (PFHxA)	1.81	U	1.81	0.22	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluoroheptanoic acid (PFHpA)	1.81	U	1.81	0.29	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorooctanoic acid (PFOA)	**0.41**	J	1.81	0.29	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorononanoic acid (PFNA)	1.81	U	1.81	0.34	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorodecanoic acid (PFDA)	1.81	U	1.81	0.34	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluoroundecanoic acid (PFUnA)	1.81	U	1.81	0.23	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorododecanoic acid (PFDoA)	1.81	U	1.81	0.32	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorotridecanoic acid (PFTriA)	1.81	U	1.81	0.22	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorotetradecanoic acid (PFTeA)	1.81	U	1.81	0.41	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorobutanesulfonic acid (PFBS)	1.81	U	1.81	0.40	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorohexanesulfonic acid (PFHxS)	1.81	U	1.81	0.24	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.81	U	1.81	0.74	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorooctanesulfonic acid (PFOS)	1.81	U	1.81	0.69	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorodecanesulfonic acid (PFDS)	1.81	U	1.81	0.48	ng/L		10/19/18 11:40	10/22/18 02:04	1
Perfluorooctanesulfonamide (FOSA)	1.81	U	1.81	0.51	ng/L		10/19/18 11:40	10/22/18 02:04	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.1	U	18.1	0.41	ng/L		10/19/18 11:40	10/22/18 02:04	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	18.1	U	18.1	0.63	ng/L		10/19/18 11:40	10/22/18 02:04	1
6:2 FTS	18.1	U	18.1	0.91	ng/L		10/19/18 11:40	10/22/18 02:04	1
8:2 FTS	18.1	U	18.1	0.51	ng/L		10/19/18 11:40	10/22/18 02:04	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	86		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C5-PFPeA DNU	120		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C2 PFHxA	108		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C4 PFHpA	90		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C4 PFOA	93		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C5 PFNA	95		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C2 PFDA	98		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C2 PFUnA	93		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C2 PFDoA	94		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C2 PFTeDA	89		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C3 PFBS	103		25 - 150	10/19/18 11:40	10/22/18 02:04	1
18O2 PFHxS	96		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C4 PFOS	97		25 - 150	10/19/18 11:40	10/22/18 02:04	1
13C8 FOSA	60		25 - 150	10/19/18 11:40	10/22/18 02:04	1
d3-NMeFOSAA	81		25 - 150	10/19/18 11:40	10/22/18 02:04	1
d5-NEtFOSAA	89		25 - 150	10/19/18 11:40	10/22/18 02:04	1
M2-6:2 FTS	144		25 - 150	10/19/18 11:40	10/22/18 02:04	1
M2-8:2 FTS	91		25 - 150	10/19/18 11:40	10/22/18 02:04	1

DRAFT

TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

NYSC 460501

TestAmerica

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 166804
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:			
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.16			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Fulton-PFAS-1803556-1.16	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, Z - other (specify)
Other:

SUB Work

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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
1 FW-MW-19	10/11/18	1015	G	Water	N		X	X	4	
2 FW-MW-5R	10/11/18	1155	G	Water	N		X	X	4	
3 FW-MW-04	10/11/18	1105	G	Water	N		X	X	4	
4 FW-MW-17	10/11/18	0900	G	Water	N		X	X	12	MS/MSD
5 DUP-101118	10/11/18	—	G	Water	N	N	X	X	4	
6 FB-101118	10/11/18	1115	G	Water	N	N	X	X	4	

460-166804 Chain of Custody

Possible Hazard Identification
x 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 x Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

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

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		10/12/18 1330	GEI		10/12/18 1230	TA
2		10/12/18 2000	TA		10/12/18 2000	TA
3						

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

3.3 / 3.5 / 3.5 IR69

Ver: 08/04/2016

DRAFT

Site: Long Island Emerging Contaminants, Glen Cove
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165577
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
GCMW-14S-R	460-165577-01	PFAS, 1,4-Dioxane
PZ-06	460-165577-02	PFAS, 1,4-Dioxane
GCRW-03	460-165577-03	PFAS, 1,4-Dioxane
MW-XX-092518	460-165577-04	PFAS, 1,4-Dioxane
FB-092518	460-165577-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: Fieldblank-092518
Field Duplicate pair: PZ-06/MW-XX-092518

The above-listed aqueous samples and field blank sample were collected on September 25, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorobutanoic acid (PFBA)	Method MB 200-134832: All samples	0.881 ng/L	8.81 ng/L	Qualify the result for PFBA in sample FB-092518 as nondetect (U) at the RL. Qualify the result for PFBA in samples GCMW-14S-R, PZ-06, GCRW-03, and MW-XX-092518 as estimated (J); High bias.
Perfluorohexanoic acid (PFHxA)		0.407 ng/L	4.07 ng/L	Qualify the results for PFHxA in sample FB-092518 as nondetect (U) at the RL. Qualify the result for PFHxA in samples PZ-06, GCRW-03, and MW-XX-092518 as estimated (J); High bias.
Perfluorobutanesulfonic acid (PFBS)		1.178 ng/L	11.78 ng/L	Qualify the result for PFBS in samples GCRW-03 and FB-092518 as nondetect (U) at the RL. Qualify the results for PFBS in samples GCMW-14S-R, PZ-06, and MW-XX-092518 as estimated (J); High bias.
Perfluorohexanesulfonic acid (PFHxS)		0.559 ng/L	5.59 ng/L	Qualify the result for PFHxS in samples GCRW-03 and FB-092518 as nondetect (U) at the RL. Qualify the result for PFHxS in sample GCMW-14S-R as estimated (J); High bias.
Perfluorooctanesulfonic acid (PFOS)		1.143 ng/L	11.43 ng/L	Qualify the result for PFOS in sample FB-092518 as nondetect (U) at the RL. Qualify the result for PFOS in samples GCMW-14S-R, PZ-06, GCRW-03, and MW-XX-092518 as estimated (J); High bias.
Perfluoroundecanoic Acid (PFUnA)	FB-092518: All samples	0.40 ng/L	4.0 ng/L	Qualify the result for PFUnA in samples PZ-06 and GCRW-03 as nondetect (U) at the RL.

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Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorotridecanoic Acid (PFTriA)		0.46 ng/L	4.6 ng/L	Qualify the result for PFTriA in sample GCRW-03 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
GCRW-03	M2-6:2 FTS	190	25-150	Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	169		
MW-XX-092518	M2-6:2 FTS	186	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-XX-092518.
	M2-8:2 FTS	155		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
PZ-06	M2-6:2 FTS	173	25-150	Estimate (J) the positive result for 6:2 FTS in sample PZ-06.

MS/MSD Results

MS/MSD analyses were performed on sample GCMW-14S-R for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

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Field Duplicate Results

Samples PZ-06 and MW-XX-092518 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	PZ-06 (ug/L)	MW-XX-092518 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	3.33	3.41	2.4
Perfluoropentanoic (PFPeA)	3.66	3.02	19.2
Perfluorohexanoic acid (PFHxA)	2.62	1.90	31.9, Within the RL
Perfluoroheptanoic acid (PFHpA)	2.30	2.41	4.7
Perfluorooctanoic acid (PFOA)	11.3	12.4	9.3
Perfluorononanoic acid (PFNA)	1.08 J	1.19 J	9.7
Perfluorobutanesulfonic acid (PFBS)	3.10	2.43	24.2
Perfluorohexanesulfonic acid(PFHxS)	6.24	6.32	1.3
Perfluoroheptanesulfonic Acid (PFHpS)	0.87 J	0.85 J	2.3
Perfluorooctanesulfonic acid (PFOS)	9.67	8.52	12.6
Perfluorodecanesulfonic acid (PFDS)	1.76 U	0.48 J	NC, Within the RL
6:2 FTS	4.64 J	5.08 J	9.1
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DRAFT

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample ID: GCMW-14S-R
Date Collected: 09/25/18 08:30
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 18:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*70*		*10 - 150*	*09/29/18 06:51*	*09/29/18 18:18*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**5.33**	B J	1.77	0.36	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluoropentanoic acid (PFPeA)	**7.41**		1.77	0.66	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorohexanoic acid (PFHxA)	**8.06**	B	1.77	0.21	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluoroheptanoic acid (PFHpA)	**6.83**		1.77	0.28	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorooctanoic acid (PFOA)	**17.4**		1.77	0.28	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorononanoic acid (PFNA)	**0.92**	J	1.77	0.34	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorodecanoic acid (PFDA)	1.77	U	1.77	0.34	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluoroundecanoic acid (PFUnA)	1.77	U	1.77	0.22	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorododecanoic acid (PFDoA)	1.77	U	1.77	0.31	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorotridecanoic acid (PFTriA)	1.77	U	1.77	0.21	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorotetradecanoic acid (PFTeA)	1.77	U	1.77	0.40	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorobutanesulfonic acid (PFBS)	**9.38**	B J	1.77	0.39	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorohexanesulfonic acid (PFHxS)	**2.87**	B J	1.77	0.23	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.72**	J	1.77	0.72	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorooctanesulfonic acid (PFOS)	**6.14**	B J	1.77	0.67	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorodecanesulfonic acid (PFDS)	1.77	U	1.77	0.47	ng/L		10/04/18 14:05	10/12/18 03:51	1
Perfluorooctanesulfonamide (FOSA)	1.77	U	1.77	0.49	ng/L		10/04/18 14:05	10/12/18 03:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.7	U	17.7	0.40	ng/L		10/04/18 14:05	10/12/18 03:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.7	U	17.7	0.62	ng/L		10/04/18 14:05	10/12/18 03:51	1
6:2 FTS	**1.31**	J	17.7	0.88	ng/L		10/04/18 14:05	10/12/18 03:51	1
8:2 FTS	17.7	U	17.7	0.49	ng/L		10/04/18 14:05	10/12/18 03:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*63*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C5-PFPeA DNU	*57*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C2 PFHxA	*98*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C4 PFHpA	*88*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C4 PFOA	*93*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C5 PFNA	*101*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C2 PFDA	*78*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C2 PFUnA	*83*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C2 PFDoA	*87*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C2 PFTeDA	*62*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C3 PFBS	*93*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
18O2 PFHxS	*115*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C4 PFOS	*120*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
13C8 FOSA	*81*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
d3-NMeFOSAA	*67*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*
d5-NEtFOSAA	*73*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:51*	*1*

DRAFT

AM 10/29/18

Client Sample ID: GCMW-14S-R

Date Collected: 09/25/18 08:30
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	137		25 - 150	10/04/18 14:05	10/12/18 03:51	1
M2-8:2 FTS	120		25 - 150	10/04/18 14:05	10/12/18 03:51	1

Client Sample ID: PZ-06

Date Collected: 09/25/18 09:40
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 20:20	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	34		10 - 150	09/29/18 06:51	09/29/18 20:20	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.33**	**B J**	1.76	0.36	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluoropentanoic acid (PFPeA)	**3.66**		1.76	0.66	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorohexanoic acid (PFHxA)	**2.62**	**B J**	1.76	0.21	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluoroheptanoic acid (PFHpA)	**2.30**		1.76	0.28	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorooctanoic acid (PFOA)	**11.3**		1.76	0.28	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorononanoic acid (PFNA)	**1.08**	**J**	1.76	0.33	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorodecanoic acid (PFDA)	1.76	U	1.76	0.33	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluoroundecanoic acid (PFUnA)	~~0.23 J~~ 1.76	U	1.76	0.22	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorobutanesulfonic acid (PFBS)	**3.10**	**B J**	1.76	0.39	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorohexanesulfonic acid (PFHxS)	**6.24**	**B**	1.76	0.23	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.87**	**J**	1.76	0.72	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorooctanesulfonic acid (PFOS)	**9.67**	**B J**	1.76	0.67	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/04/18 14:05	10/12/18 04:38	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/04/18 14:05	10/12/18 04:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/04/18 14:05	10/12/18 04:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.61	ng/L		10/04/18 14:05	10/12/18 04:38	1
6:2 FTS	**4.64**	**J**	17.6	0.88	ng/L		10/04/18 14:05	10/12/18 04:38	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/04/18 14:05	10/12/18 04:38	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	50		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C5-PFPeA DNU	50		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C2 PFHxA	86		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C4 PFHpA	92		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C4 PFOA	106		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C5 PFNA	133		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C2 PFDA	98		25 - 150	10/04/18 14:05	10/12/18 04:38	1

DRAFT

Client Sample ID: PZ-06

Date Collected: 09/25/18 09:40
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	112		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C2 PFDoA	111		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C2 PFTeDA	83		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C3 PFBS	84		25 - 150	10/04/18 14:05	10/12/18 04:38	1
18O2 PFHxS	122		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C4 PFOS	140		25 - 150	10/04/18 14:05	10/12/18 04:38	1
13C8 FOSA	89		25 - 150	10/04/18 14:05	10/12/18 04:38	1
d3-NMeFOSAA	96		25 - 150	10/04/18 14:05	10/12/18 04:38	1
d5-NEtFOSAA	94		25 - 150	10/04/18 14:05	10/12/18 04:38	1
M2-6:2 FTS	173	*	25 - 150	10/04/18 14:05	10/12/18 04:38	1
M2-8:2 FTS	143		25 - 150	10/04/18 14:05	10/12/18 04:38	1

Client Sample ID: GCRW-03

Date Collected: 09/25/18 11:30
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 20:37	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	41		10 - 150	09/29/18 06:51	09/29/18 20:37	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.98	~~B~~ J ·	1.83	0.37	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluoropentanoic acid (PFPeA)	4.22		1.83	0.69	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorohexanoic acid (PFHxA)	2.75	~~B~~ J ·	1.83	0.22	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluoroheptanoic acid (PFHpA)	2.14		1.83	0.29	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorooctanoic acid (PFOA)	2.38		1.83	0.29	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorononanoic acid (PFNA)	1.32	J ·	1.83	0.35	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorodecanoic acid (PFDA)	1.92		1.83	0.35	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluoroundecanoic acid (PFUnA)	~~1.06 J~~	1.83U ·	1.83	0.23	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorododecanoic acid (PFDoA)	0.52	J ·	1.83	0.32	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorotridecanoic acid (PFTriA)	~~0.23 J~~	1.83U ·	1.83	0.22	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorotetradecanoic acid (PFTeA)	1.83	U	1.83	0.41	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorobutanesulfonic acid (PFBS)	~~1.48 J B~~	1.83U ·	1.83	0.40	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.58 J B~~	1.83U ·	1.83	0.24	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.86	J ·	1.83	0.75	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorooctanesulfonic acid (PFOS)	3.17	~~B~~ J ·	1.83	0.69	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorodecanesulfonic acid (PFDS)	0.48	J ·	1.83	0.48	ng/L		10/04/18 14:05	10/12/18 05:10	1
Perfluorooctanesulfonamide (FOSA)	1.83	U	1.83	0.51	ng/L		10/04/18 14:05	10/12/18 05:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.3	U	18.3	0.41	ng/L		10/04/18 14:05	10/12/18 05:10	1

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Client Sample ID: GCRW-03

Date Collected: 09/25/18 11:30
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	18.3	U	18.3	0.64	ng/L		10/04/18 14:05	10/12/18 05:10	1
6:2 FTS	18.3	U	18.3	0.91	ng/L		10/04/18 14:05	10/12/18 05:10	1
8:2 FTS	18.3	U	18.3	0.51	ng/L		10/04/18 14:05	10/12/18 05:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*64*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C5-PFPeA DNU	*62*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C2 PFHxA	*110*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C4 PFHpA	*96*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C4 PFOA	*105*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C5 PFNA	*132*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C2 PFDA	*94*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C2 PFUnA	*111*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C2 PFDoA	*98*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C2 PFTeDA	*78*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C3 PFBS	*118*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
18O2 PFHxS	*138*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C4 PFOS	*137*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
13C8 FOSA	*113*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
d3-NMeFOSAA	*98*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
d5-NEtFOSAA	*107*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
M2-6:2 FTS	*190*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*
M2-8:2 FTS	*169*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 05:10*	*1*

Client Sample ID: MW-XX-092518

Date Collected: 09/25/18 00:00
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 20:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*35*		*10 - 150*	*09/29/18 06:51*	*09/29/18 20:54*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.41**	B J.	1.70	0.35	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluoropentanoic acid (PFPeA)	**3.02**		1.70	0.64	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorohexanoic acid (PFHxA)	**1.90**	B J.	1.70	0.20	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluoroheptanoic acid (PFHpA)	**2.41**		1.70	0.27	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorooctanoic acid (PFOA)	**12.4**		1.70	0.27	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorononanoic acid (PFNA)	**1.19**	J.	1.70	0.32	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorodecanoic acid (PFDA)	1.70	U	1.70	0.32	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluoroundecanoic acid (PFUnA)	1.70	U	1.70	0.21	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorododecanoic acid (PFDoA)	1.70	U	1.70	0.30	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorotridecanoic acid (PFTriA)	1.70	U	1.70	0.20	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorotetradecanoic acid (PFTeA)	1.70	U	1.70	0.38	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorobutanesulfonic acid (PFBS)	**2.43**	B J.	1.70	0.37	ng/L		10/04/18 14:05	10/12/18 05:26	1

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Client Sample ID: MW-XX-092518

Date Collected: 09/25/18 00:00
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**6.32**	**B**	1.70	0.22	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.85**	**J**	1.70	0.70	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorooctanesulfonic acid (PFOS)	**8.52**	**B J**	1.70	0.64	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorodecanesulfonic acid (PFDS)	**0.48**	**J**	1.70	0.45	ng/L		10/04/18 14:05	10/12/18 05:26	1
Perfluorooctanesulfonamide (FOSA)	1.70	U	1.70	0.48	ng/L		10/04/18 14:05	10/12/18 05:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.0	U	17.0	0.38	ng/L		10/04/18 14:05	10/12/18 05:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.0	U	17.0	0.59	ng/L		10/04/18 14:05	10/12/18 05:26	1
6:2 FTS	**5.08**	**J**	17.0	0.85	ng/L		10/04/18 14:05	10/12/18 05:26	1
8:2 FTS	17.0	U	17.0	0.48	ng/L		10/04/18 14:05	10/12/18 05:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	51		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C5-PFPeA DNU	45		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C2 PFHxA	84		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C4 PFHpA	84		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C4 PFOA	100		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C5 PFNA	126		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C2 PFDA	91		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C2 PFUnA	104		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C2 PFDoA	102		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C2 PFTeDA	75		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C3 PFBS	85		25 - 150	10/04/18 14:05	10/12/18 05:26	1
18O2 PFHxS	115		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C4 PFOS	138		25 - 150	10/04/18 14:05	10/12/18 05:26	1
13C8 FOSA	103		25 - 150	10/04/18 14:05	10/12/18 05:26	1
d3-NMeFOSAA	80		25 - 150	10/04/18 14:05	10/12/18 05:26	1
d5-NEtFOSAA	89		25 - 150	10/04/18 14:05	10/12/18 05:26	1
M2-6:2 FTS	186	*	25 - 150	10/04/18 14:05	10/12/18 05:26	1
M2-8:2 FTS	155	*	25 - 150	10/04/18 14:05	10/12/18 05:26	1

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Client Sample ID: FB-092518

Date Collected: 09/25/18 17:55
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 21:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	35		10 - 150	09/29/18 06:51	09/29/18 21:12	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~0.54~~	~~J B~~ 1.75U	1.75	0.36	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluoropentanoic acid (PFPeA)	1.75	U	1.75	0.65	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorohexanoic acid (PFHxA)	~~0.32~~	~~J B~~ 1.75U	1.75	0.21	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluoroheptanoic acid (PFHpA)	1.75	U	1.75	0.28	ng/L		10/04/18 14:05	10/12/18 05:42	1

Client Sample ID: FB-092518
Date Collected: 09/25/18 17:55
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165577-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.75	U	1.75	0.28	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorononanoic acid (PFNA)	1.75	U	1.75	0.33	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorodecanoic acid (PFDA)	1.75	U	1.75	0.33	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluoroundecanoic acid (PFUnA)	**0.40**	**J**	1.75	0.22	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorododecanoic acid (PFDoA)	1.75	U	1.75	0.31	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorotridecanoic acid (PFTriA)	**0.46**	**J**	1.75	0.21	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorotetradecanoic acid (PFTeA)	1.75	U	1.75	0.39	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorobutanesulfonic acid (PFBS)	~~1.10~~	~~J B~~ 1.75U	1.75	0.38	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.32~~	~~J B~~ 1.75U	1.75	0.23	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.75	U	1.75	0.72	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorooctanesulfonic acid (PFOS)	~~0.66~~	~~J B~~ 1.75U	1.75	0.66	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorodecanesulfonic acid (PFDS)	1.75	U	1.75	0.46	ng/L		10/04/18 14:05	10/12/18 05:42	1
Perfluorooctanesulfonamide (FOSA)	1.75	U	1.75	0.49	ng/L		10/04/18 14:05	10/12/18 05:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.5	U	17.5	0.39	ng/L		10/04/18 14:05	10/12/18 05:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.5	U	17.5	0.61	ng/L		10/04/18 14:05	10/12/18 05:42	1
6:2 FTS	17.5	U	17.5	0.87	ng/L		10/04/18 14:05	10/12/18 05:42	1
8:2 FTS	17.5	U	17.5	0.49	ng/L		10/04/18 14:05	10/12/18 05:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	142		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C5-PFPeA DNU	76		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C2 PFHxA	149		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C4 PFHpA	101		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C4 PFOA	111		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C5 PFNA	126		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C2 PFDA	93		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C2 PFUnA	106		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C2 PFDoA	100		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C2 PFTeDA	76		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C3 PFBS	119		25 - 150	10/04/18 14:05	10/12/18 05:42	1
18O2 PFHxS	126		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C4 PFOS	141		25 - 150	10/04/18 14:05	10/12/18 05:42	1
13C8 FOSA	80		25 - 150	10/04/18 14:05	10/12/18 05:42	1
d3-NMeFOSAA	89		25 - 150	10/04/18 14:05	10/12/18 05:42	1
d5-NEtFOSAA	88		25 - 150	10/04/18 14:05	10/12/18 05:42	1
M2-6:2 FTS	104		25 - 150	10/04/18 14:05	10/12/18 05:42	1
M2-8:2 FTS	110		25 - 150	10/04/18 14:05	10/12/18 05:42	1

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

NYSC 460501

TestAmerica

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No: 460-103130-65954.1
Client Contact: Melissa Felter	Phone: (516) 263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 16 5577
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:			
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.2			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Glen Cove-PFAS-1803556-1.2	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, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=soil, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_ISK - PFAS, Standard List (21 Analytes)	8270D_SIM_NBS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N				
GCMW-145-A	9-25-18	0830	G	Water	X	X			12	MS/MSD
PZ-06	9-25-18	0940	G	Water	X	X			4	2
GCRW-03	9-25-18	1130	G	Water	X	X			4	3
MW-XX-092518	9-25-18	—	G	Water	X	X			4	4
FB-092518	9-25-18	1755	G	Water	X	X			4	5
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						

460-165577 Chain of Custody

SUB Work

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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) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into one login and ship PFAS

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 9/26/18 1210	Company: GEI	Received by:
Relinquished by:	Date/Time: 9/26/18 19:30	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by:

Received by:	Date/Time: 9/26/18 1211	Company: TA
Received by:	Date/Time: 9/26/18 19:30	Company: TAO1
Received by:	Date/Time:	Company:

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

Cooler Temperature(s) °C and Other Remarks:

3.1 | 5 4.0 | 4.0 IR#9

Ver: 08/04/2016

Site: Long Island Emerging Contaminants, Greenpoint
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165952
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
GPEC-220I	460-165952-01	PFAS, 1,4-Dioxane
GPEC-MW-11	460-165952-02	PFAS, 1,4-Dioxane
GPEC-MW-3S	460-165952-03	PFAS, 1,4-Dioxane
DUP-100118-2	460-165952-04	PFAS, 1,4-Dioxane
FB-100118-2	460-165952-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100118-2
Field Duplicate pair: GPEC-MW-3S/DUP-100118-2

The above-listed aqueous samples and field blank sample were collected on October 1, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were not detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorobutanoic acid (PFBA)	Method MB 200-134946: All samples	1.22 ng/L	12.2 ng/L	Qualify the result for PFBA in sample FB-100118-2 as nondetect (U) at the RL. Qualify the result for PFBA in samples GPEC-MW-3S and DUP-100118-2 as estimated (J); High bias.
Perfluorooctanoic acid (PFOA)		0.392 ng/L	3.92 ng/L	Validation actions were not required.
Perfluorohexanesulfonic acid (PFHxS)		0.356 ng/L	3.56 ng/L	Qualify the result for PFHxS in samples GPEC-MW-11, GPEC-MW-3S, DUP-100118-2, and FB-100118-2 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

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Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
GPEC-220I	M2-6:2 FTS	165	25-150	Validation action was not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.
GPEC-MW-11	M2-6:2 FTS	172	25-150	Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	168		
GPEC-MW-3S	M2-6:2 FTS	161	25-150	Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	162		
DUP-100118-2	M2-8:2 FTS	157	25-150	Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.

MS/MSD Results

MS/MSD analyses were performed on sample GPEC-MW-11 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples GPEC-MW-3S and DUP-100118-2 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	GPEC-MW-03S (ug/L)	DUP-100118-2 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	9.82	9.90	0.8
Perfluoropentanoic acid (PFPeA)	3.66	3.76	2.7
Perfluorohexanoic acid (PFHxA)	1.04 J	1.57 J	40.6, Within the RL
Perfluoroheptanoic acid (PFHpA)	2.01	1.90	5.6
Perfluorooctanoic acid (PFOA)	29.4	29.4	0
Perfluorononanoic acid (PFNA)	1.90	2.35	21.2
Perfluorodecanoic acid (PFDA)	2.11	2.08	1.4
Perfluoroundecanoic acid (PFUnA)	0.55 J	0.32 J	52.9, Within the RL
Perfluorobutanesulfonic acid (PFBS)	1.30 J	1.08 J	18.5
Perfluorooctanesulfonic acid (PFOS)	11.0	10.5	4.7

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Greenpoint, 1803556-1.9

Analyte	GPEC-MW-03S (ug/L)	DUP-100118-2 (ug/L)	RPD (%)
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: GPEC-220I
Date Collected: 10/01/18 14:40
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/04/18 06:40	10/04/18 14:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*34*		*10 - 150*	*10/04/18 06:40*	*10/04/18 14:50*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**17.8**	**B**	1.76	0.36	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluoropentanoic acid (PFPeA)	**19.6**		1.76	0.66	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorohexanoic acid (PFHxA)	**17.0**		1.76	0.21	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluoroheptanoic acid (PFHpA)	**14.9**		1.76	0.28	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorooctanoic acid (PFOA)	**97.5**	**B**	1.76	0.28	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorononanoic acid (PFNA)	**2.50**		1.76	0.33	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorodecanoic acid (PFDA)	**0.34**	**J**	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluoroundecanoic acid (PFUnA)	**0.26**	**J**	1.76	0.22	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorobutanesulfonic acid (PFBS)	**5.18**		1.76	0.39	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorohexanesulfonic acid (PFHxS)	**22.4**	**B**	1.76	0.23	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.79**	**J**	1.76	0.72	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorooctanesulfonic acid (PFOS)	**57.9**		1.76	0.67	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/08/18 09:18	10/13/18 07:16	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/08/18 09:18	10/13/18 07:16	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/08/18 09:18	10/13/18 07:16	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/08/18 09:18	10/13/18 07:16	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/08/18 09:18	10/13/18 07:16	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/08/18 09:18	10/13/18 07:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*33*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C5-PFPeA DNU	*49*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C2 PFHxA	*57*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C4 PFHpA	*84*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C4 PFOA	*98*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C2 PFDA	*107*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C2 PFUnA	*108*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C2 PFDoA	*99*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C3 PFBS	*68*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
18O2 PFHxS	*79*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C4 PFOS	*75*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
13C8 FOSA	*52*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:16*	*1*

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Client Sample ID: GPEC-220I
Date Collected: 10/01/18 14:40
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	165	*	25 - 150	10/08/18 09:18	10/13/18 07:16	1
M2-8:2 FTS	137		25 - 150	10/08/18 09:18	10/13/18 07:16	1

Client Sample ID: GPEC-MW-11
Date Collected: 10/01/18 09:30
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/04/18 06:40	10/04/18 14:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	38		10 - 150	10/04/18 06:40	10/04/18 14:32	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**19.1**	~~B~~	1.78	0.36	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluoropentanoic acid (PFPeA)	**3.03**		1.78	0.67	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorohexanoic acid (PFHxA)	**5.31**		1.78	0.21	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluoroheptanoic acid (PFHpA)	**6.56**		1.78	0.28	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorooctanoic acid (PFOA)	**8.54**	~~B~~	1.78	0.28	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorononanoic acid (PFNA)	**1.01**	~~J~~	1.78	0.34	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorodecanoic acid (PFDA)	**1.31**	~~J~~	1.78	0.34	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluoroundecanoic acid (PFUnA)	**1.14**	~~J~~	1.78	0.22	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorododecanoic acid (PFDoA)	1.78	U	1.78	0.31	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorotridecanoic acid (PFTriA)	**0.34**	~~J~~	1.78	0.21	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorotetradecanoic acid (PFTeA)	1.78	U	1.78	0.40	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorobutanesulfonic acid (PFBS)	**2.11**		1.78	0.39	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.50 J B~~	1.78U	1.78	0.23	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.78	U	1.78	0.73	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorooctanesulfonic acid (PFOS)	**3.10**		1.78	0.67	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorodecanesulfonic acid (PFDS)	1.78	U	1.78	0.47	ng/L		10/08/18 09:18	10/13/18 07:32	1
Perfluorooctanesulfonamide (FOSA)	1.78	U	1.78	0.50	ng/L		10/08/18 09:18	10/13/18 07:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.8	U	17.8	0.40	ng/L		10/08/18 09:18	10/13/18 07:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.8	U	17.8	0.62	ng/L		10/08/18 09:18	10/13/18 07:32	1
6:2 FTS	17.8	U	17.8	0.89	ng/L		10/08/18 09:18	10/13/18 07:32	1
8:2 FTS	17.8	U	17.8	0.50	ng/L		10/08/18 09:18	10/13/18 07:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	29		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C5-PFPeA DNU	43		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C2 PFHxA	51		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C4 PFHpA	75		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C4 PFOA	91		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C5 PFNA	101		25 - 150	10/08/18 09:18	10/13/18 07:32	1

DRAFT

Client Sample ID: GPEC-MW-11

Date Collected: 10/01/18 09:30
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	102		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C2 PFUnA	113		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C2 PFDoA	101		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C2 PFTeDA	108		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C3 PFBS	58		25 - 150	10/08/18 09:18	10/13/18 07:32	1
18O2 PFHxS	77		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C4 PFOS	73		25 - 150	10/08/18 09:18	10/13/18 07:32	1
13C8 FOSA	52		25 - 150	10/08/18 09:18	10/13/18 07:32	1
d3-NMeFOSAA	80		25 - 150	10/08/18 09:18	10/13/18 07:32	1
d5-NEtFOSAA	101		25 - 150	10/08/18 09:18	10/13/18 07:32	1
M2-6:2 FTS	172	*	25 - 150	10/08/18 09:18	10/13/18 07:32	1
M2-8:2 FTS	168	*	25 - 150	10/08/18 09:18	10/13/18 07:32	1

Client Sample ID: GPEC-MW-3S

Date Collected: 10/01/18 13:10
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/04/18 06:40	10/04/18 15:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	39		10 - 150	10/04/18 06:40	10/04/18 15:07	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**9.82**	B J	1.76	0.36	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluoropentanoic acid (PFPeA)	**3.66**		1.76	0.66	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorohexanoic acid (PFHxA)	**1.04**	J	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluoroheptanoic acid (PFHpA)	**2.01**		1.76	0.28	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorooctanoic acid (PFOA)	**29.4**	B	1.76	0.28	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorononanoic acid (PFNA)	**1.90**		1.76	0.33	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorodecanoic acid (PFDA)	**2.11**		1.76	0.33	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluoroundecanoic acid (PFUnA)	**0.55**	J	1.76	0.22	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorobutanesulfonic acid (PFBS)	**1.30**	J	1.76	0.39	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.07~~ J B	1.760	1.76	0.23	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.76	U	1.76	0.72	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorooctanesulfonic acid (PFOS)	**11.0**		1.76	0.67	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/08/18 09:18	10/13/18 08:20	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/08/18 09:18	10/13/18 08:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/08/18 09:18	10/13/18 08:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.61	ng/L		10/08/18 09:18	10/13/18 08:20	1

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Client Sample ID: GPEC-MW-3S

Date Collected: 10/01/18 13:10
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/08/18 09:18	10/13/18 08:20	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/08/18 09:18	10/13/18 08:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*37*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C5-PFPeA DNU	*46*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C2 PFHxA	*26*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C4 PFHpA	*79*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C4 PFOA	*96*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C5 PFNA	*107*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C2 PFDA	*104*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C2 PFUnA	*110*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C2 PFDoA	*95*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C2 PFTeDA	*111*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C3 PFBS	*65*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
18O2 PFHxS	*79*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C4 PFOS	*79*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
13C8 FOSA	*57*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
M2-6:2 FTS	*161*	*	*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*
M2-8:2 FTS	*162*	*	*25 - 150*	*10/08/18 09:18*	*10/13/18 08:20*	*1*

Client Sample ID: DUP-100118-2

Date Collected: 10/01/18 00:00
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/04/18 06:40	10/04/18 15:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*38*		*10 - 150*	*10/04/18 06:40*	*10/04/18 15:24*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**9.90**	~~B~~ J ·	1.74	0.36	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluoropentanoic acid (PFPeA)	**3.76**		1.74	0.65	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorohexanoic acid (PFHxA)	**1.57**	J ·	1.74	0.21	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluoroheptanoic acid (PFHpA)	**1.90**		1.74	0.28	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorooctanoic acid (PFOA)	**29.4**	~~B~~	1.74	0.28	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorononanoic acid (PFNA)	**2.35**		1.74	0.33	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorodecanoic acid (PFDA)	**2.08**		1.74	0.33	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluoroundecanoic acid (PFUnA)	**0.32**	J ·	1.74	0.22	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorododecanoic acid (PFDoA)	1.74	U	1.74	0.31	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorotridecanoic acid (PFTriA)	1.74	U	1.74	0.21	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorotetradecanoic acid (PFTeA)	1.74	U	1.74	0.39	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorobutanesulfonic acid (PFBS)	**1.08**	J ·	1.74	0.38	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.08~~ ~~J B~~ 1.74 U ·		1.74	0.23	ng/L		10/08/18 09:18	10/13/18 08:36	1

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Client Sample ID: DUP-100118-2

Date Collected: 10/01/18 00:00
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanesulfonic Acid (PFHpS)	1.74	U	1.74	0.71	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorooctanesulfonic acid (PFOS)	**10.5**		1.74	0.66	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorodecanesulfonic acid (PFDS)	1.74	U	1.74	0.46	ng/L		10/08/18 09:18	10/13/18 08:36	1
Perfluorooctanesulfonamide (FOSA)	1.74	U	1.74	0.49	ng/L		10/08/18 09:18	10/13/18 08:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.4	U	17.4	0.39	ng/L		10/08/18 09:18	10/13/18 08:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.4	U	17.4	0.61	ng/L		10/08/18 09:18	10/13/18 08:36	1
6:2 FTS	17.4	U	17.4	0.87	ng/L		10/08/18 09:18	10/13/18 08:36	1
8:2 FTS	17.4	U	17.4	0.49	ng/L		10/08/18 09:18	10/13/18 08:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	31		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C5-PFPeA DNU	44		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C2 PFHxA	25		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C4 PFHpA	72		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C4 PFOA	91		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C5 PFNA	96		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C2 PFDA	105		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C2 PFUnA	102		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C2 PFDoA	96		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C2 PFTeDA	71		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C3 PFBS	56		25 - 150	10/08/18 09:18	10/13/18 08:36	1
18O2 PFHxS	66		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C4 PFOS	72		25 - 150	10/08/18 09:18	10/13/18 08:36	1
13C8 FOSA	53		25 - 150	10/08/18 09:18	10/13/18 08:36	1
d3-NMeFOSAA	77		25 - 150	10/08/18 09:18	10/13/18 08:36	1
d5-NEtFOSAA	93		25 - 150	10/08/18 09:18	10/13/18 08:36	1
M2-6:2 FTS	141		25 - 150	10/08/18 09:18	10/13/18 08:36	1
M2-8:2 FTS	157	*	25 - 150	10/08/18 09:18	10/13/18 08:36	1

Client Sample ID: FB-100118-2

Date Collected: 10/01/18 14:00
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/04/18 06:40	10/04/18 15:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	39		10 - 150	10/04/18 06:40	10/04/18 15:42	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~0.37~~ J B 1.63U.		1.63	0.33	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluoropentanoic acid (PFPeA)	1.63	U	1.63	0.61	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorohexanoic acid (PFHxA)	1.63	U	1.63	0.20	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluoroheptanoic acid (PFHpA)	1.63	U	1.63	0.26	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorooctanoic acid (PFOA)	1.63	U	1.63	0.26	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorononanoic acid (PFNA)	1.63	U	1.63	0.31	ng/L		10/08/18 09:18	10/13/18 08:52	1

DRAFT

Client: GEI Consultants, Inc.
Project/Site: Greenpoint-PFAS-1803556-1.9

TestAmerica Job ID: 460-165952-1

Client Sample ID: FB-100118-2
Date Collected: 10/01/18 14:00
Date Received: 10/02/18 18:00

Lab Sample ID: 460-165952-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	1.63	U	1.63	0.31	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluoroundecanoic acid (PFUnA)	1.63	U	1.63	0.20	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorododecanoic acid (PFDoA)	1.63	U	1.63	0.28	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorotridecanoic acid (PFTriA)	1.63	U	1.63	0.20	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorotetradecanoic acid (PFTeA)	1.63	U	1.63	0.37	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorobutanesulfonic acid (PFBS)	1.63	U	1.63	0.36	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.25 J B~~ 1.63 U		1.63	0.21	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.63	U	1.63	0.67	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorooctanesulfonic acid (PFOS)	1.63	U	1.63	0.62	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorodecanesulfonic acid (PFDS)	1.63	U	1.63	0.43	ng/L		10/08/18 09:18	10/13/18 08:52	1
Perfluorooctanesulfonamide (FOSA)	1.63	U	1.63	0.46	ng/L		10/08/18 09:18	10/13/18 08:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.3	U	16.3	0.37	ng/L		10/08/18 09:18	10/13/18 08:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.3	U	16.3	0.57	ng/L		10/08/18 09:18	10/13/18 08:52	1
6:2 FTS	16.3	U	16.3	0.81	ng/L		10/08/18 09:18	10/13/18 08:52	1
8:2 FTS	16.3	U	16.3	0.46	ng/L		10/08/18 09:18	10/13/18 08:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	69		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C5-PFPeA DNU	70		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C2 PFHxA	82		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C4 PFHpA	89		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C4 PFOA	95		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C5 PFNA	89		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C2 PFDA	92		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C2 PFUnA	95		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C2 PFDoA	88		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C2 PFTeDA	85		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C3 PFBS	70		25 - 150	10/08/18 09:18	10/13/18 08:52	1
18O2 PFHxS	68		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C4 PFOS	65		25 - 150	10/08/18 09:18	10/13/18 08:52	1
13C8 FOSA	43		25 - 150	10/08/18 09:18	10/13/18 08:52	1
d3-NMeFOSAA	72		25 - 150	10/08/18 09:18	10/13/18 08:52	1
d5-NEtFOSAA	87		25 - 150	10/08/18 09:18	10/13/18 08:52	1
M2-6:2 FTS	85		25 - 150	10/08/18 09:18	10/13/18 08:52	1
M2-8:2 FTS	101		25 - 150	10/08/18 09:18	10/13/18 08:52	1

DRAFT

TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

10/15/2018

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 166962
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:			Preservation Codes:
City: Glastonbury	TAT Requested (days): 10 days			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, Z - other (specify)
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.9			Other:
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Greenpoint-PFAS-1803556-1.9	SSOW#:			

Analysis Requested

SUB Work

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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
9AM 10/29/18 ~~MW-220I~~ GPEC-220I	10/1/18	1440	G	Water	N				4	1
~~MW-11~~ GPEC-MW11	10/1/18	930	G	Water	N				12	MS/MSD 2
GPEC-MW-3S	10/1/18	1310	G	Water	N				4	3
DUP-100118-2	10/1/18	—	G	Water	N	N			4	4
FB-100118-2	10/1/18	1400	G	Water	N	N			4	5

460-165952 Chain of Custody

Possible Hazard Identification
x 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 x Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10/2/18 1238	GEI		10/2/18 1238	T. A
2		10/2/18 1800	T A		10/2/18 1800	T A
3						

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

Cooler Temperature(s) °C and Other Remarks:

2.8/2.8 3.0/3.0 TAL

Ver: 08/04/2016

DRAFT

Site: Long Island Emerging Contaminants, Inwood
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-167680
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 16, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
GW-8	460-167680-01	PFAS, 1,4-Dioxane
MW-16S	460-167680-02	PFAS, 1,4-Dioxane
MW-52I	460-167680-03	PFAS, 1,4-Dioxane
FB-102318	460-167680-04	PFAS, 1,4-Dioxane
DUP-102318	460-167680-03	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-102318
Field Duplicate pair: MW-16S/DUP-102318

The above-listed aqueous samples and field blank sample were collected on October 23, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

1,4-Dioxane

All initial and continuing calibration criteria were met.

PFAS

Compounds that did not meet criteria in the calibrations are summarized in the following table.

Instrument/ Calibration Standard	Compound	Calibration Exceedance	Validation Qualifier
LC410 Low Level CCVL 11/02 13:19	8:2 FTS	-50.3 %D	Estimate (UJ) nondetect results for 8:2 FTS in samples GW-8, MW-16S, MW-52I, FB-102318, and DUP-102318; Low bias.
Associated samples: GW-8, MW-16S, MW-52I, FB-102318, DUP-102318			

Low level Continuing Calibration Verification (CCVL) percent recovery (%R) > 50%D; professional judgment was taken to estimate results less than the affected range of five times the reporting limit (RL) dependent on the recovery.

Blanks

PFAS

Analytes were not detected in the associated laboratory method sample and field blank.

1,4-Dioxane

1,4-Dioxane was not detected in the associated method blank sample. 1,4-Dioxane was detected in the associated field blank sample. The following table summarizes the contamination and validation actions taken.

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Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane	FB-102318: All samples	0.12 ug/L	1.2 ug/L	Qualify the result for 1,4-dioxane in sample MW-52I as nondetect (U) at the RL. Qualify the result for 1,4-dioxane as estimated (J) in sample GW-8; High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
GW-8	13C4 PFBA	14	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and Perfluoropentanoic acid (PFPeA) in sample GW-8.
	13C5-PFPeA	21		
MW-52I	13C4 PFBA	20	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample MW-52I.
	M2-6:2 FTS	163		
	M2-8:2 FTS	180		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample GW-8 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

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Field Duplicate Results

Samples MW-16S and DUP-102318 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-16S (ng/L)	DUP-102318 (ng/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	21.4	23.3	8.5
Perfluoropentanoic (PFPeA)	9.61	10.4	7.9
Perfluorohexanoic acid (PFHxA)	1.90	2.24	16.4
Perfluoroheptanoic acid (PFHpA)	0.78 J	0.76 J	2.6
Perfluorooctanoic acid (PFOA)	2.81	2.73	2.9
Perfluoroundecanoic acid (PFUnA)	0.26 J	1.64 U	NC, Not within the RL
Perfluorobutanesulfonic acid (PFBS)	0.45 J	0.60 J	28.6
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Dilutions were not required.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: GW-8

Date Collected: 10/23/18 09:15
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-1

Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.49	J ·	0.20	0.016	ug/L		10/26/18 13:28	10/26/18 22:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*42*		*10 - 150*	*10/26/18 13:28*	*10/26/18 22:03*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**20.9**	J ·	1.66	0.34	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluoropentanoic acid (PFPeA)	**40.3**	J ·	1.66	0.62	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorohexanoic acid (PFHxA)	**6.58**		1.66	0.20	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluoroheptanoic acid (PFHpA)	**9.84**		1.66	0.26	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorooctanoic acid (PFOA)	**48.3**		1.66	0.26	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorononanoic acid (PFNA)	**0.31**	J	1.66	0.31	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorodecanoic acid (PFDA)	1.66	U	1.66	0.31	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluoroundecanoic acid (PFUnA)	**0.23**	J	1.66	0.21	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorododecanoic acid (PFDoA)	1.66	U	1.66	0.29	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorotridecanoic acid (PFTriA)	1.66	U	1.66	0.20	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorotetradecanoic acid (PFTeA)	1.66	U	1.66	0.37	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorobutanesulfonic acid (PFBS)	**8.79**		1.66	0.36	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorohexanesulfonic acid (PFHxS)	**1.74**		1.66	0.22	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.66	U	1.66	0.68	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorooctanesulfonic acid (PFOS)	**1.98**		1.66	0.63	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorodecanesulfonic acid (PFDS)	1.66	U	1.66	0.44	ng/L		11/02/18 09:15	11/03/18 01:47	1
Perfluorooctanesulfonamide (FOSA)	1.66	U	1.66	0.46	ng/L		11/02/18 09:15	11/03/18 01:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.6	U	16.6	0.37	ng/L		11/02/18 09:15	11/03/18 01:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.6	U	16.6	0.58	ng/L		11/02/18 09:15	11/03/18 01:47	1
6:2 FTS	16.6	U	16.6	0.83	ng/L		11/02/18 09:15	11/03/18 01:47	1
8:2 FTS	16.6	U J ·	16.6	0.46	ng/L		11/02/18 09:15	11/03/18 01:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*14*	*	*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C5-PFPeA DNU	*21*	*	*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C2 PFHxA	*29*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C4 PFHpA	*62*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C4 PFOA	*76*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C5 PFNA	*92*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C2 PFDA	*95*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C2 PFUnA	*90*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C2 PFDoA	*79*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C2 PFTeDA	*79*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C3 PFBS	*66*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
18O2 PFHxS	*83*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C4 PFOS	*87*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
13C8 FOSA	*69*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
d5-NEtFOSAA	*85*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*

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Client Sample ID: GW-8

Lab Sample ID: 460-167680-1
Matrix: Water

Date Collected: 10/23/18 09:15
Date Received: 10/24/18 20:00

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
M2-6:2 FTS	*143*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*
M2-8:2 FTS	*122*		*25 - 150*	*11/02/18 09:15*	*11/03/18 01:47*	*1*

Client Sample ID: MW-16S

Lab Sample ID: 460-167680-2
Matrix: Water

Date Collected: 10/23/18 11:05
Date Received: 10/24/18 20:00

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/26/18 13:28	10/26/18 22:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*47*		*10 - 150*	*10/26/18 13:28*	*10/26/18 22:19*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**21.4**		1.64	0.34	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluoropentanoic acid (PFPeA)	**9.61**		1.64	0.62	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorohexanoic acid (PFHxA)	**1.90**		1.64	0.20	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluoroheptanoic acid (PFHpA)	**0.78**	J	1.64	0.26	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorooctanoic acid (PFOA)	**2.81**		1.64	0.26	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorononanoic acid (PFNA)	1.64	U	1.64	0.31	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorodecanoic acid (PFDA)	1.64	U	1.64	0.31	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluoroundecanoic acid (PFUnA)	**0.26**	J	1.64	0.21	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorododecanoic acid (PFDoA)	1.64	U	1.64	0.29	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorotridecanoic acid (PFTriA)	1.64	U	1.64	0.20	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorotetradecanoic acid (PFTeA)	1.64	U	1.64	0.37	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorobutanesulfonic acid (PFBS)	**0.45**	J	1.64	0.36	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorohexanesulfonic acid (PFHxS)	1.64	U	1.64	0.21	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.64	U	1.64	0.67	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorooctanesulfonic acid (PFOS)	1.64	U	1.64	0.62	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorodecanesulfonic acid (PFDS)	1.64	U	1.64	0.44	ng/L		11/02/18 09:15	11/03/18 02:34	1
Perfluorooctanesulfonamide (FOSA)	1.64	U	1.64	0.46	ng/L		11/02/18 09:15	11/03/18 02:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.4	U	16.4	0.37	ng/L		11/02/18 09:15	11/03/18 02:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.4	U	16.4	0.58	ng/L		11/02/18 09:15	11/03/18 02:34	1
6:2 FTS	16.4	U	16.4	0.82	ng/L		11/02/18 09:15	11/03/18 02:34	1
8:2 FTS	16.4	U J-	16.4	0.46	ng/L		11/02/18 09:15	11/03/18 02:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*42*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C5-PFPeA DNU	*50*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C2 PFHxA	*53*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C4 PFHpA	*66*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C4 PFOA	*71*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C5 PFNA	*68*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C2 PFDA	*70*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C2 PFUnA	*65*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*
13C2 PFDoA	*62*		*25 - 150*	*11/02/18 09:15*	*11/03/18 02:34*	*1*

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Client Sample ID: MW-16S
Date Collected: 10/23/18 11:05
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	70		25 - 150	11/02/18 09:15	11/03/18 02:34	1
13C3 PFBS	84		25 - 150	11/02/18 09:15	11/03/18 02:34	1
18O2 PFHxS	79		25 - 150	11/02/18 09:15	11/03/18 02:34	1
13C4 PFOS	71		25 - 150	11/02/18 09:15	11/03/18 02:34	1
13C8 FOSA	49		25 - 150	11/02/18 09:15	11/03/18 02:34	1
d3-NMeFOSAA	58		25 - 150	11/02/18 09:15	11/03/18 02:34	1
d5-NEtFOSAA	73		25 - 150	11/02/18 09:15	11/03/18 02:34	1
M2-6:2 FTS	79		25 - 150	11/02/18 09:15	11/03/18 02:34	1
M2-8:2 FTS	74		25 - 150	11/02/18 09:15	11/03/18 02:34	1

Client Sample ID: MW-52I
Date Collected: 10/23/18 12:45
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.15~~	~~J~~ 0.200	0.20	0.016	ug/L		10/26/18 13:28	10/26/18 22:36	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	44		10 - 150	10/26/18 13:28	10/26/18 22:36	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**42.3**	J	1.68	0.34	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluoropentanoic acid (PFPeA)	**21.1**		1.68	0.63	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorohexanoic acid (PFHxA)	**18.4**		1.68	0.20	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluoroheptanoic acid (PFHpA)	**13.1**		1.68	0.27	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorooctanoic acid (PFOA)	**38.1**		1.68	0.27	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorononanoic acid (PFNA)	**5.08**		1.68	0.32	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorodecanoic acid (PFDA)	**1.38**	J	1.68	0.32	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluoroundecanoic acid (PFUnA)	**0.59**	J	1.68	0.21	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorododecanoic acid (PFDoA)	1.68	U	1.68	0.29	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorotridecanoic acid (PFTriA)	1.68	U	1.68	0.20	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorotetradecanoic acid (PFTeA)	1.68	U	1.68	0.38	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorobutanesulfonic acid (PFBS)	**11.4**		1.68	0.37	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorohexanesulfonic acid (PFHxS)	**8.78**		1.68	0.22	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.29**	J	1.68	0.69	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorooctanesulfonic acid (PFOS)	**74.2**		1.68	0.64	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorodecanesulfonic acid (PFDS)	1.68	U	1.68	0.44	ng/L		11/02/18 09:15	11/03/18 02:50	1
Perfluorooctanesulfonamide (FOSA)	1.68	U	1.68	0.47	ng/L		11/02/18 09:15	11/03/18 02:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.8	U	16.8	0.38	ng/L		11/02/18 09:15	11/03/18 02:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.8	U	16.8	0.59	ng/L		11/02/18 09:15	11/03/18 02:50	1
6:2 FTS	**1.96**	J	16.8	0.84	ng/L		11/02/18 09:15	11/03/18 02:50	1
8:2 FTS	16.8	U J	16.8	0.47	ng/L		11/02/18 09:15	11/03/18 02:50	1

DRAFT

Client Sample ID: MW-52I

Date Collected: 10/23/18 12:45
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	20	*	25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C5-PFPeA DNU	28		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C2 PFHxA	35		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C4 PFHpA	59		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C4 PFOA	79		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C5 PFNA	85		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C2 PFDA	98		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C2 PFUnA	103		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C2 PFDoA	99		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C2 PFTeDA	96		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C3 PFBS	67		25 - 150	11/02/18 09:15	11/03/18 02:50	1
18O2 PFHxS	96		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C4 PFOS	100		25 - 150	11/02/18 09:15	11/03/18 02:50	1
13C8 FOSA	53		25 - 150	11/02/18 09:15	11/03/18 02:50	1
d3-NMeFOSAA	82		25 - 150	11/02/18 09:15	11/03/18 02:50	1
d5-NEtFOSAA	104		25 - 150	11/02/18 09:15	11/03/18 02:50	1
M2-6:2 FTS	163	*	25 - 150	11/02/18 09:15	11/03/18 02:50	1
M2-8:2 FTS	180	*	25 - 150	11/02/18 09:15	11/03/18 02:50	1

Client Sample ID: FB-102318

Date Collected: 10/23/18 09:30
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.12	J	0.20	0.016	ug/L		10/26/18 13:28	10/26/18 22:53	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	40		10 - 150	10/26/18 13:28	10/26/18 22:53	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.77	U	1.77	0.36	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluoropentanoic acid (PFPeA)	1.77	U	1.77	0.67	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorohexanoic acid (PFHxA)	1.77	U	1.77	0.21	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluoroheptanoic acid (PFHpA)	1.77	U	1.77	0.28	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorooctanoic acid (PFOA)	1.77	U	1.77	0.28	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorononanoic acid (PFNA)	1.77	U	1.77	0.34	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorodecanoic acid (PFDA)	1.77	U	1.77	0.34	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluoroundecanoic acid (PFUnA)	1.77	U	1.77	0.22	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorododecanoic acid (PFDoA)	1.77	U	1.77	0.31	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorotridecanoic acid (PFTriA)	1.77	U	1.77	0.21	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorotetradecanoic acid (PFTeA)	1.77	U	1.77	0.40	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorobutanesulfonic acid (PFBS)	1.77	U	1.77	0.39	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorohexanesulfonic acid (PFHxS)	1.77	U	1.77	0.23	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.77	U	1.77	0.73	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorooctanesulfonic acid (PFOS)	1.77	U	1.77	0.67	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorodecanesulfonic acid (PFDS)	1.77	U	1.77	0.47	ng/L		11/02/18 09:15	11/03/18 03:06	1
Perfluorooctanesulfonamide (FOSA)	1.77	U	1.77	0.50	ng/L		11/02/18 09:15	11/03/18 03:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.7	U	17.7	0.40	ng/L		11/02/18 09:15	11/03/18 03:06	1

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Client Sample ID: FB-102318

Date Collected: 10/23/18 09:30
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.7	U	17.7	0.62	ng/L		11/02/18 09:15	11/03/18 03:06	1
6:2 FTS	17.7	U	17.7	0.89	ng/L		11/02/18 09:15	11/03/18 03:06	1
8:2 FTS	17.7	U J	17.7	0.50	ng/L		11/02/18 09:15	11/03/18 03:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	74		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C5-PFPeA DNU	72		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C2 PFHxA	73		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C4 PFHpA	84		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C4 PFOA	84		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C5 PFNA	84		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C2 PFDA	87		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C2 PFUnA	88		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C2 PFDoA	74		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C2 PFTeDA	73		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C3 PFBS	93		25 - 150	11/02/18 09:15	11/03/18 03:06	1
18O2 PFHxS	90		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C4 PFOS	88		25 - 150	11/02/18 09:15	11/03/18 03:06	1
13C8 FOSA	49		25 - 150	11/02/18 09:15	11/03/18 03:06	1
d3-NMeFOSAA	77		25 - 150	11/02/18 09:15	11/03/18 03:06	1
d5-NEtFOSAA	86		25 - 150	11/02/18 09:15	11/03/18 03:06	1
M2-6:2 FTS	75		25 - 150	11/02/18 09:15	11/03/18 03:06	1
M2-8:2 FTS	89		25 - 150	11/02/18 09:15	11/03/18 03:06	1

Client Sample ID: DUP-102318

Date Collected: 10/23/18 00:00
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/26/18 13:28	10/26/18 23:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	46		10 - 150	10/26/18 13:28	10/26/18 23:09	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**23.3**		1.64	0.34	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluoropentanoic acid (PFPeA)	**10.4**		1.64	0.62	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorohexanoic acid (PFHxA)	**2.24**		1.64	0.20	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluoroheptanoic acid (PFHpA)	**0.76**	J	1.64	0.26	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorooctanoic acid (PFOA)	**2.73**		1.64	0.26	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorononanoic acid (PFNA)	1.64	U	1.64	0.31	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorodecanoic acid (PFDA)	1.64	U	1.64	0.31	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluoroundecanoic acid (PFUnA)	1.64	U	1.64	0.21	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorododecanoic acid (PFDoA)	1.64	U	1.64	0.29	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorotridecanoic acid (PFTriA)	1.64	U	1.64	0.20	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorotetradecanoic acid (PFTeA)	1.64	U	1.64	0.37	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorobutanesulfonic acid (PFBS)	**0.60**	J	1.64	0.36	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorohexanesulfonic acid (PFHxS)	1.64	U	1.64	0.21	ng/L		11/02/18 09:15	11/03/18 03:22	1

DRAFT

Client: GEI Consultants, Inc.
Project/Site: Inwood-PFAS-1803556-1.5

TestAmerica Job ID: 460-167680-1

Client Sample ID: DUP-102318
Date Collected: 10/23/18 00:00
Date Received: 10/24/18 20:00

Lab Sample ID: 460-167680-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanesulfonic Acid (PFHpS)	1.64	U	1.64	0.67	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorooctanesulfonic acid (PFOS)	1.64	U	1.64	0.62	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorodecanesulfonic acid (PFDS)	1.64	U	1.64	0.44	ng/L		11/02/18 09:15	11/03/18 03:22	1
Perfluorooctanesulfonamide (FOSA)	1.64	U	1.64	0.46	ng/L		11/02/18 09:15	11/03/18 03:22	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.4	U	16.4	0.37	ng/L		11/02/18 09:15	11/03/18 03:22	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.4	U	16.4	0.58	ng/L		11/02/18 09:15	11/03/18 03:22	1
6:2 FTS	16.4	U	16.4	0.82	ng/L		11/02/18 09:15	11/03/18 03:22	1
8:2 FTS	16.4	U J.	16.4	0.46	ng/L		11/02/18 09:15	11/03/18 03:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	41		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C5-PFPeA DNU	51		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C2 PFHxA	49		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C4 PFHpA	68		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C4 PFOA	73		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C5 PFNA	71		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C2 PFDA	69		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C2 PFUnA	69		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C2 PFDoA	62		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C2 PFTeDA	65		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C3 PFBS	78		25 - 150	11/02/18 09:15	11/03/18 03:22	1
18O2 PFHxS	84		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C4 PFOS	74		25 - 150	11/02/18 09:15	11/03/18 03:22	1
13C8 FOSA	46		25 - 150	11/02/18 09:15	11/03/18 03:22	1
d3-NMeFOSAA	65		25 - 150	11/02/18 09:15	11/03/18 03:22	1
d5-NEtFOSAA	70		25 - 150	11/02/18 09:15	11/03/18 03:22	1
M2-6:2 FTS	78		25 - 150	11/02/18 09:15	11/03/18 03:22	1
M2-8:2 FTS	75		25 - 150	11/02/18 09:15	11/03/18 03:22	1

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

NYSC 460-

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 167680
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:		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, Z - other (specify)
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				Other:
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.5			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Inwood-PFAS-1803556-1.5	SSOW#:			

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)	537 (PFC_IDA - PFAS, Standard List (21 Analytes))	537 (PFC_IDA - PFAS, Standard List (21 Analytes))	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
Preservation Code:						N	N			
GW-8	10/23/18	0915	G	Water	N				12	MS/MSD
MW-16S	10/23/18	11:05	G	Water	N				4	
MW-52I	10/23/18	12:45	G	Water	N				4	
FB-102318	10/23/18	09:30	G	Water	N	N			4	
DUP-102318	10/23/18	–	G	Water	N	N			4	

SUB Work

DRAFT

460-167680 Chain of Custody

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) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 1320 10/24/18	Company	Received by: Date/Time: 10/24/18 1320 Company
Relinquished by:	Date/Time:	Company	Received by: Date/Time: 10/24/18 1815 Company
Relinquished by:	Date/Time: 10/24/18 2000	Company TAFdi	Received by: Date/Time: 10/24/18 2000 Company TAEdi
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: No		Cooler Temperature(s) °C and Other Remarks: 4.3°C 2.8°C

Ver: 08/04/2016

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11/09/2018

Site: Long Island Emerging Contaminants, Kings County
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166359
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 15, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
KC-MW-01	460-166359-01	PFAS, 1,4-Dioxane
KC-MW-05	460-166359-02	PFAS, 1,4-Dioxane
KC-MW-09	460-166359-03	PFAS, 1,4-Dioxane
DUP-100518-2	460-166359-04	PFAS, 1,4-Dioxane
FB-100518-2	460-166359-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100518-2
Field Duplicate pair: KC-MW-05/DUP-100518-2

The above-listed aqueous samples and field blank sample were collected on October 5, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

DRAFT

The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

1,4-Dioxane and PFAS

Analytes were detected in the associated laboratory method and field blank samples. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane				
1,4-Dioxane	FB-100518-2: All samples	0.13 ug/L	1.3 ug/L	Qualify the results for 1,4-dioxane in samples KC-MW-05, KC-MW-09, and DUP-100518-2 as nondetect (U) at the RL. Qualify the positive result for 1,4-dioxane in sample KC-MW-01 as estimated (J); High bias.
PFAS				
Perfluorooctanoic acid (PFOA)	Method MB 200-135439: All samples	0.321 ng/L	3.21 ng/L	Qualify the result for Perfluorooctanoic acid (PFOA) in sample FB-100518-2 as nondetect (U) at the RL.
Perfluoroundecanoic acid (PFUnA)		0.301 ng/L	3.01 ng/L	Qualify the result for Perfluoroundecanoic acid (PFUnA) in sample KC-MW-09 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method

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recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
KC-MW-01	M2-6:2 FTS	253	25-150	Estimate (J) the positive result for 6:2 FTS in sample KC-MW-01.
KC-MW-09	M2-6:2 FTS	308	25-150	Estimate (J) the positive result for 6:2 FTS in sample KC-MW-09.
	M2-8:2 FTS	203		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
FB-100518-2	M2-6:2 FTS	153	25-150	Validation action was not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.
DUP-100518-2 (10-fold dilution)	13C4 PFBA	17	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample DUP-100518-2.
	M2-6:2 FTS	205		
	M2-8:2 FTS	166		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
KC-MW-05 (10-fold dilution)	M2-6:2 FTS	302	25-150	Estimate (J) the positive result for 6:2 FTS in sample KC-MW-05.
	M2-8:2 FTS	178		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample KC-MW-09 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

1,4-Dioxane

All criteria were met.

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PFAS

The following table lists the internal standards recovered outside of control limits and the resulting actions.

Sample	Internal Standard	Recovery (%)	Control Limits (%)	Validation Actions
KC-MW-05 (25-fold dilution)	13C2 PFOA	184	50-150	Estimate (J) the positive results reported from the 25-fold dilution analysis of sample KC-MW-05: Perfluorobutanoic acid (PFBA), Perfluoroheptanoic acid (PFHpA), and Perfluorooctanoic acid (PFOA).
DUP-100518-2 (25-fold dilution)	13C2 PFOA	165	50-150	Estimate (J) the positive results reported from the 25-fold dilution analysis of sample DUP-100518-2: Perfluoroheptanoic acid (PFHpA) and Perfluorooctanoic acid (PFOA) in sample DUP-100518-2.

Field Duplicate Results

Samples KC-MW-05 and DUP-100518-2 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	KC-MW-05 (ng/L)	DUP-100518-2 (ng/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	2940	3210	8.8
Perfluoropentanoic (PFPeA)	243	221	9.5
Perfluorohexanoic acid (PFHxA)	19.6 U	11.1 J	NC, Within the RL
Perfluoroheptanoic acid (PFHpA)	33.2 J	28.1 J	16.6
Perfluorooctanoic acid (PFOA)	155	154	0.6
Perfluorononanoic acid (PFNA)	34.1	30.1	12.5
Perfluorobutanesulfonic acid (PFBS)	93.7	96.9	3.4
6:2 FTS	21.8 J	32.0 J	37.9, Within the RL
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

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Sample	PFAS Analysis Reported
KC-MW-05	A 25-fold dilution was performed for Perfluorobutanoic acid (PFBA), Perfluoroheptanoic acid (PFHpA), and Perfluorooctanoic acid (PFOA) due to sample matrix. All other results were reported from the 10-fold dilution analysis. RLs were elevated in this sample.
DUP-100518-2	A 25-fold dilution was performed for Perfluoroheptanoic acid (PFHpA) and Perfluorooctanoic acid (PFOA) due to sample matrix. All other results were reported from the 10-fold dilution analysis. RLs were elevated in this sample.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: KC-MW-01
Date Collected: 10/05/18 12:05
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.57	J	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 11:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*44*		*10 - 150*	*10/09/18 20:13*	*10/10/18 11:12*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**10.9**		1.67	0.34	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluoropentanoic acid (PFPeA)	**15.9**		1.67	0.62	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorohexanoic acid (PFHxA)	**18.3**		1.67	0.20	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluoroheptanoic acid (PFHpA)	**25.2**		1.67	0.27	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorooctanoic acid (PFOA)	**86.7**	B	1.67	0.27	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorononanoic acid (PFNA)	**2.90**		1.67	0.32	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorodecanoic acid (PFDA)	1.67	U	1.67	0.32	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluoroundecanoic acid (PFUnA)	1.67	U	1.67	0.21	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorododecanoic acid (PFDoA)	1.67	U	1.67	0.29	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorotridecanoic acid (PFTriA)	1.67	U	1.67	0.20	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorotetradecanoic acid (PFTeA)	1.67	U	1.67	0.37	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorobutanesulfonic acid (PFBS)	**2.74**		1.67	0.37	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorohexanesulfonic acid (PFHxS)	**2.44**		1.67	0.22	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.67	U	1.67	0.68	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorooctanesulfonic acid (PFOS)	**5.52**		1.67	0.63	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorodecanesulfonic acid (PFDS)	1.67	U	1.67	0.44	ng/L		10/18/18 13:58	10/21/18 17:50	1
Perfluorooctanesulfonamide (FOSA)	1.67	U	1.67	0.47	ng/L		10/18/18 13:58	10/21/18 17:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.7	U	16.7	0.37	ng/L		10/18/18 13:58	10/21/18 17:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.7	U	16.7	0.58	ng/L		10/18/18 13:58	10/21/18 17:50	1
6:2 FTS	**1.08**	J	16.7	0.83	ng/L		10/18/18 13:58	10/21/18 17:50	1
8:2 FTS	16.7	U	16.7	0.47	ng/L		10/18/18 13:58	10/21/18 17:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*41*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C5-PFPeA DNU	*64*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C2 PFHxA	*68*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C4 PFHpA	*83*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C4 PFOA	*95*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C5 PFNA	*105*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C2 PFDA	*102*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C2 PFUnA	*96*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C2 PFDoA	*100*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C2 PFTeDA	*94*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C3 PFBS	*81*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
18O2 PFHxS	*102*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C4 PFOS	*112*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
13C8 FOSA	*68*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*10/18/18 13:58*	*10/21/18 17:50*	*1*

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Client Sample ID: KC-MW-01

Date Collected: 10/05/18 12:05
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	253	*	25 - 150	10/18/18 13:58	10/21/18 17:50	1
M2-8:2 FTS	125		25 - 150	10/18/18 13:58	10/21/18 17:50	1

Client Sample ID: KC-MW-05

Date Collected: 10/05/18 11:25
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.10~~	~~J~~ 0.20U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 11:29	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	51		10 - 150	10/09/18 20:13	10/10/18 11:29	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2940**	J.	49.0	10.0	ng/L		10/18/18 13:58	10/22/18 18:19	25
Perfluoropentanoic acid (PFPeA)	**243**		19.6	7.35	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorohexanoic acid (PFHxA)	19.6	U	19.6	2.35	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluoroheptanoic acid (PFHpA)	**33.2**	J.	49.0	7.84	ng/L		10/18/18 13:58	10/22/18 18:19	25
Perfluorooctanoic acid (PFOA)	**155**	B J.	49.0	7.84	ng/L		10/18/18 13:58	10/22/18 18:19	25
Perfluorononanoic acid (PFNA)	**34.1**		19.6	3.73	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorodecanoic acid (PFDA)	19.6	U	19.6	3.73	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluoroundecanoic acid (PFUnA)	19.6	U	19.6	2.45	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorododecanoic acid (PFDoA)	19.6	U	19.6	3.43	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorotridecanoic acid (PFTriA)	19.6	U	19.6	2.35	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorotetradecanoic acid (PFTeA)	19.6	U	19.6	4.41	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorobutanesulfonic acid (PFBS)	**93.7**		19.6	4.31	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorohexanesulfonic acid (PFHxS)	19.6	U	19.6	2.55	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluoroheptanesulfonic Acid (PFHpS)	19.6	U	19.6	8.04	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorooctanesulfonic acid (PFOS)	19.6	U	19.6	7.45	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorodecanesulfonic acid (PFDS)	19.6	U	19.6	5.20	ng/L		10/18/18 13:58	10/22/18 17:00	10
Perfluorooctanesulfonamide (FOSA)	19.6	U	19.6	5.49	ng/L		10/18/18 13:58	10/22/18 17:00	10
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	196	U	196	4.41	ng/L		10/18/18 13:58	10/22/18 17:00	10
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	196	U	196	6.86	ng/L		10/18/18 13:58	10/22/18 17:00	10
6:2 FTS	**21.8**	J.	196	9.80	ng/L		10/18/18 13:58	10/22/18 17:00	10
8:2 FTS	196	U	196	5.49	ng/L		10/18/18 13:58	10/22/18 17:00	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	27		25 - 150	10/18/18 13:58	10/22/18 18:19	25
13C5-PFPeA DNU	42		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C2 PFHxA	39		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C4 PFHpA	67		25 - 150	10/18/18 13:58	10/22/18 18:19	25
13C4 PFOA	97		25 - 150	10/18/18 13:58	10/22/18 18:19	25
13C5 PFNA	118		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C2 PFDA	127		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C2 PFUnA	144		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C2 PFDoA	145		25 - 150	10/18/18 13:58	10/22/18 17:00	10

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Client Sample ID: KC-MW-05

Date Collected: 10/05/18 11:25
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	120		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C3 PFBS	95		25 - 150	10/18/18 13:58	10/22/18 17:00	10
18O2 PFHxS	99		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C4 PFOS	109		25 - 150	10/18/18 13:58	10/22/18 17:00	10
13C8 FOSA	86		25 - 150	10/18/18 13:58	10/22/18 17:00	10
d3-NMeFOSAA	138		25 - 150	10/18/18 13:58	10/22/18 17:00	10
d5-NEtFOSAA	148		25 - 150	10/18/18 13:58	10/22/18 17:00	10
M2-6:2 FTS	302	*	25 - 150	10/18/18 13:58	10/22/18 17:00	10
M2-8:2 FTS	178	*	25 - 150	10/18/18 13:58	10/22/18 17:00	10

Client Sample ID: KC-MW-09

Date Collected: 10/05/18 10:55
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.15~~	~~J~~ 0.20 U	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 11:47	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	52		10 - 150	10/09/18 20:13	10/10/18 11:47	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	28.3		1.61	0.33	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluoropentanoic acid (PFPeA)	19.5		1.61	0.61	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorohexanoic acid (PFHxA)	7.90		1.61	0.19	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluoroheptanoic acid (PFHpA)	9.91		1.61	0.26	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorooctanoic acid (PFOA)	44.7	B	1.61	0.26	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorononanoic acid (PFNA)	5.43		1.61	0.31	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorodecanoic acid (PFDA)	0.54	J	1.61	0.31	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluoroundecanoic acid (PFUnA)	~~0.25~~	~~J B~~ 1.61 U	1.61	0.20	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorododecanoic acid (PFDoA)	1.61	U	1.61	0.28	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorotridecanoic acid (PFTriA)	1.61	U	1.61	0.19	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorotetradecanoic acid (PFTeA)	1.61	U	1.61	0.36	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorobutanesulfonic acid (PFBS)	2.41		1.61	0.36	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorohexanesulfonic acid (PFHxS)	1.50	J	1.61	0.21	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.61	U	1.61	0.66	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorooctanesulfonic acid (PFOS)	6.00		1.61	0.61	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorodecanesulfonic acid (PFDS)	1.61	U	1.61	0.43	ng/L		10/18/18 13:58	10/21/18 18:22	1
Perfluorooctanesulfonamide (FOSA)	1.61	U	1.61	0.45	ng/L		10/18/18 13:58	10/21/18 18:22	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.1	U	16.1	0.36	ng/L		10/18/18 13:58	10/21/18 18:22	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.1	U	16.1	0.57	ng/L		10/18/18 13:58	10/21/18 18:22	1
6:2 FTS	2.36	J	16.1	0.81	ng/L		10/18/18 13:58	10/21/18 18:22	1
8:2 FTS	16.1	U	16.1	0.45	ng/L		10/18/18 13:58	10/21/18 18:22	1

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Client Sample ID: KC-MW-09
Date Collected: 10/05/18 10:55
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	27		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C5-PFPeA DNU	41		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C2 PFHxA	53		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C4 PFHpA	71		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C4 PFOA	98		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C5 PFNA	111		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C2 PFDA	116		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C2 PFUnA	126		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C2 PFDoA	130		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C2 PFTeDA	124		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C3 PFBS	82		25 - 150	10/18/18 13:58	10/21/18 18:22	1
18O2 PFHxS	103		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C4 PFOS	115		25 - 150	10/18/18 13:58	10/21/18 18:22	1
13C8 FOSA	69		25 - 150	10/18/18 13:58	10/21/18 18:22	1
d3-NMeFOSAA	108		25 - 150	10/18/18 13:58	10/21/18 18:22	1
d5-NEtFOSAA	141		25 - 150	10/18/18 13:58	10/21/18 18:22	1
M2-6:2 FTS	308	*	25 - 150	10/18/18 13:58	10/21/18 18:22	1
M2-8:2 FTS	203	*	25 - 150	10/18/18 13:58	10/21/18 18:22	1

Client Sample ID: DUP-100518-2
Date Collected: 10/05/18 00:00
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~0.11~~	~~J~~ 0.200 *	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 12:39	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	49		10 - 150	10/09/18 20:13	10/10/18 12:39	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3210**	J.	19.2	3.94	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluoropentanoic acid (PFPeA)	**221**		19.2	7.21	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorohexanoic acid (PFHxA)	**11.1**	J.	19.2	2.31	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluoroheptanoic acid (PFHpA)	**28.1**	J.	48.1	7.69	ng/L		10/18/18 13:58	10/22/18 18:35	25
Perfluorooctanoic acid (PFOA)	**154**	B J.	48.1	7.69	ng/L		10/18/18 13:58	10/22/18 18:35	25
Perfluorononanoic acid (PFNA)	**30.1**		19.2	3.65	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorodecanoic acid (PFDA)	19.2	U	19.2	3.65	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluoroundecanoic acid (PFUnA)	19.2	U	19.2	2.40	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorododecanoic acid (PFDoA)	19.2	U	19.2	3.36	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorotridecanoic acid (PFTriA)	19.2	U	19.2	2.31	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorotetradecanoic acid (PFTeA)	19.2	U	19.2	4.33	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorobutanesulfonic acid (PFBS)	**96.9**		19.2	4.23	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorohexanesulfonic acid (PFHxS)	19.2	U	19.2	2.50	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluoroheptanesulfonic Acid (PFHpS)	19.2	U	19.2	7.88	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorooctanesulfonic acid (PFOS)	19.2	U	19.2	7.30	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorodecanesulfonic acid (PFDS)	19.2	U	19.2	5.09	ng/L		10/18/18 13:58	10/22/18 18:04	10
Perfluorooctanesulfonamide (FOSA)	19.2	U	19.2	5.38	ng/L		10/18/18 13:58	10/22/18 18:04	10

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Client Sample ID: DUP-100518-2

Date Collected: 10/05/18 00:00
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	192	U	192	4.33	ng/L		10/18/18 13:58	10/22/18 18:04	10
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	192	U	192	6.73	ng/L		10/18/18 13:58	10/22/18 18:04	10
6:2 FTS	**32.0**	J	192	9.61	ng/L		10/18/18 13:58	10/22/18 18:04	10
8:2 FTS	192	U	192	5.38	ng/L		10/18/18 13:58	10/22/18 18:04	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*17*	*	*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C5-PFPeA DNU	*50*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C2 PFHxA	*36*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C4 PFHpA	*63*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:35*	*25*
13C4 PFOA	*86*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:35*	*25*
13C5 PFNA	*122*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C2 PFDA	*124*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C2 PFUnA	*128*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C2 PFDoA	*117*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C2 PFTeDA	*104*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C3 PFBS	*88*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
18O2 PFHxS	*89*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C4 PFOS	*121*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
13C8 FOSA	*91*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
d3-NMeFOSAA	*107*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
d5-NEtFOSAA	*134*		*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
M2-6:2 FTS	*205*	*	*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*
M2-8:2 FTS	*166*	*	*25 - 150*	*10/18/18 13:58*	*10/22/18 18:04*	*10*

Client Sample ID: FB-100518-2

Date Collected: 10/05/18 11:15
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.13**	J	0.20	0.016	ug/L		10/09/18 20:13	10/10/18 12:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*40*		*10 - 150*	*10/09/18 20:13*	*10/10/18 12:56*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.64	U	1.64	0.34	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluoropentanoic acid (PFPeA)	1.64	U	1.64	0.61	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorohexanoic acid (PFHxA)	1.64	U	1.64	0.20	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluoroheptanoic acid (PFHpA)	1.64	U	1.64	0.26	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorooctanoic acid (PFOA)	~~0.33~~	~~J B~~ 1.64U	1.64	0.26	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorononanoic acid (PFNA)	1.64	U	1.64	0.31	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorodecanoic acid (PFDA)	1.64	U	1.64	0.31	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluoroundecanoic acid (PFUnA)	1.64	U	1.64	0.20	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorododecanoic acid (PFDoA)	1.64	U	1.64	0.29	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorotridecanoic acid (PFTriA)	1.64	U	1.64	0.20	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorotetradecanoic acid (PFTeA)	1.64	U	1.64	0.37	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorobutanesulfonic acid (PFBS)	1.64	U	1.64	0.36	ng/L		10/18/18 13:58	10/21/18 19:26	1

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Client Sample ID: FB-100518-2
Date Collected: 10/05/18 11:15
Date Received: 10/05/18 16:24

Lab Sample ID: 460-166359-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	1.64	U	1.64	0.21	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.64	U	1.64	0.67	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorooctanesulfonic acid (PFOS)	1.64	U	1.64	0.62	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorodecanesulfonic acid (PFDS)	1.64	U	1.64	0.43	ng/L		10/18/18 13:58	10/21/18 19:26	1
Perfluorooctanesulfonamide (FOSA)	1.64	U	1.64	0.46	ng/L		10/18/18 13:58	10/21/18 19:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.4	U	16.4	0.37	ng/L		10/18/18 13:58	10/21/18 19:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.4	U	16.4	0.57	ng/L		10/18/18 13:58	10/21/18 19:26	1
6:2 FTS	16.4	U	16.4	0.82	ng/L		10/18/18 13:58	10/21/18 19:26	1
8:2 FTS	16.4	U	16.4	0.46	ng/L		10/18/18 13:58	10/21/18 19:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*77*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C5-PFPeA DNU	*108*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C2 PFHxA	*106*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C4 PFHpA	*88*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C4 PFOA	*94*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C5 PFNA	*98*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C2 PFDA	*98*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C2 PFUnA	*100*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C2 PFDoA	*101*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C2 PFTeDA	*98*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C3 PFBS	*100*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
18O2 PFHxS	*92*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C4 PFOS	*96*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
13C8 FOSA	*71*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
d3-NMeFOSAA	*79*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
d5-NEtFOSAA	*90*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
M2-6:2 FTS	*153*	*	*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*
M2-8:2 FTS	*98*		*25 - 150*	*10/18/18 13:58*	*10/21/18 19:26*	*1*

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

NYSC 460501

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 166359
Address: 455 Winding Brook Drive, Suite 201	Due Date Requested:			
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.11			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Kings Co-PFAS-1803556-1.11	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, 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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)											Total Number of containers	Special Instructions/Note:
Preservation Code:					N	N														
KC-MW-01	10/5/18	1206	G	Water	N												1		4	
KC-MW-~~04~~ 05	10/5/18	1125	G	Water	N												2		4	
KC-MW-09	10/5/18	1055	G	Water	N												3		12	MS/MSD
DUP-100518-2	10/5/18	—	G	Water	N	N											4		4	
FB-100518-2	10/5/18	1115	G	Water	N	N											5		4	

460-166359 Chain of Custody

Possible Hazard Identification
x 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 x Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: Craig Hayes	Date/Time: 10-5-18	Company: GEI	Received by:		Date/Time: 10/5/18 13:15	Company: TA	
Relinquished by:	Date/Time: 10/5/18 17:30	Company: TA	Received by:		Date/Time: 10/6/18 16:30	Company: TA	
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company	
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:				

3.0 / 3.2 / 3.2 TRA 9

Ver: 08/04/2016

DRAFT

Site: Long Island Emerging Contaminants, Patchogue
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165575
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-4S	460-165575-01	PFAS, 1,4-Dioxane
MW-7S	460-165575-02	PFAS, 1,4-Dioxane
MW-1	460-165575-03	PFAS, 1,4-Dioxane
MW-XX-092518	460-165575-04	PFAS, 1,4-Dioxane
FB-092518	460-165575-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: Fieldblank-092518
Field Duplicate pair: MW-7S/MW-XX-092518

The above-listed aqueous samples and field blank sample were collected on September 25, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were not detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorobutanoic acid (PFBA)	Method MB 200-134832: All samples	0.881 ng/L	8.81 ng/L	Qualify the result for PFBA in sample FB-092518 as nondetect (U) at the RL. Qualify the results for PFBA in samples MW-4S and MW-XX-092518 as estimated (J); High bias.
Perfluorohexanoic acid (PFHxA)		0.407 ng/L	4.07 ng/L	Qualify the result for PFHxA in sample FB-092518 as nondetect (U) at the RL. Qualify the result for PFHxA in sample MW-4S as estimated (J); High bias.
Perfluorobutanesulfonic acid (PFBS)		1.178 ng/L	11.78 ng/L	Qualify the result for PFBS in sample FB-092518 as nondetect (U) at the RL. Qualify the result for PFBS in sample MW-1 as estimated (J); High bias.
Perfluorohexanesulfonic acid (PFHxS)		0.559 ng/L	5.59 ng/L	Qualify the result for PFHxS in samples MW-1 and FB-092518 as nondetect (U) at the RL.
Perfluorooctanesulfonic acid (PFOS)		1.143 ng/L	11.43 ng/L	Qualify the result for PFOS in sample FB-092518 as nondetect (U) at the RL.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

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Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-4S	M2-6:2 FTS	215	25-150	Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	175		
MW-7S	M2-6:2 FTS	307	25-150	Validation action was not required as the results for 6:2 FTS, 8:2 FTS, and Perfluorotetradecanoic acid (PFTeA) were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	267		
	13C2 PFTeDA	155		
MW-1	13C5-PFPeA	24	25-150	Estimate (J) the positive results for Perfluoropentanoic acid (PFPeA), 6:2 FTS, Perfluorooctanesulfonic acid (PFOS) in sample MW-1.
	M2-6:2 FTS	321		
	PFOS	161		
	M2-8:2 FTS	345		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
MW-XX-092518	M2-6:2 FTS	330	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-XX-092518.
	M2-8:2 FTS	296		Validation action was not required as the results for 8:2 FTS and Perfluorotetradecanoic acid (PFTeA) were not detected in this sample and therefore not affected by the high recoveries.
	13C2 PFTeDA	177		

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-4S for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

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Field Duplicate Results

Samples MW-7S and MW-XX-092518 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria except for Perfluoropentanoic acid (PFPeA) and Perfluorooctanesulfonic acid (PFOS). The positive results for Perfluoropentanoic acid and Perfluorooctanesulfonic acid in samples MW-7S and MW-XX-092518 were qualified as estimated (J). The direction of bias cannot be determined from this nonconformance.

Analyte	MW-7S (ug/L)	MW-XX-092518 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	8.82	7.44	17.0
Perfluoropentanoic (PFPeA)	5.12	8.88	**53.7**
Perfluorohexanoic acid (PFHxA)	9.05	9.89	8.9
Perfluoroheptanoic acid (PFHpA)	6.96	6.08	13.5
Perfluorooctanoic acid (PFOA)	16.7	17.2	3.0
Perfluorononanoic acid (PFNA)	1.13 J	1.34 J	17.0
Perfluorodecanoic acid (PFDA)	0.72 J	0.81 J	11.8
Perfluorobutanesulfonic acid (PFBS)	20.8	21.0	1.0
Perfluorohexanesulfonic acid(PFHxS)	44.6	41.0	8.4
Perfluoroheptanesulfonic Acid (PFHpS)	11.7	14.6	22.1
Perfluorooctanesulfonic acid (PFOS)	1630	1170	**32.9**
Perfluorooctanesulfonamide (FOSA)	1.79 U	0.83 J	NC, Within the RL
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	7.76 J	7.59 J	2.2
6:2 FTS	17.9 U	1.03 J	NC, Within the RL
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
MW-7S	A 10-fold dilution was performed for Perfluorooctanesulfonic acid (PFOS) due to high analyte level. All other results were reported from the undiluted analysis.
MW-XX-092518	A 10-fold dilution was performed for Perfluorooctanesulfonic acid (PFOS) due to high analyte level. All other results were reported from the undiluted analysis.

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Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Patchogue-PFAS-1803556-1.3

TestAmerica Job ID: 460-165575-1

Client Sample ID: MW-4S
Date Collected: 09/25/18 14:30
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 17:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*71*		*10 - 150*	*09/29/18 06:51*	*09/29/18 17:27*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.73**	B J	1.76	0.36	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluoropentanoic acid (PFPeA)	**3.88**		1.76	0.66	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorohexanoic acid (PFHxA)	**2.96**	B J	1.76	0.21	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluoroheptanoic acid (PFHpA)	**3.67**		1.76	0.28	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorooctanoic acid (PFOA)	**12.5**		1.76	0.28	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorononanoic acid (PFNA)	**0.75**	J	1.76	0.33	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorodecanoic acid (PFDA)	**0.56**	J	1.76	0.33	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluoroundecanoic acid (PFUnA)	**0.27**	J	1.76	0.22	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorododecanoic acid (PFDoA)	**0.32**	J	1.76	0.31	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorotridecanoic acid (PFTriA)	**0.27**	J	1.76	0.21	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorobutanesulfonic acid (PFBS)	**18.0**	B	1.76	0.39	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorohexanesulfonic acid (PFHxS)	**22.2**	B	1.76	0.23	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluoroheptanesulfonic Acid (PFHpS)	**2.82**		1.76	0.72	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorooctanesulfonic acid (PFOS)	**91.8**	B	1.76	0.67	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorodecanesulfonic acid (PFDS)	**0.47**	J	1.76	0.47	ng/L		10/04/18 14:05	10/12/18 02:00	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/04/18 14:05	10/12/18 02:00	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/04/18 14:05	10/12/18 02:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/04/18 14:05	10/12/18 02:00	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/04/18 14:05	10/12/18 02:00	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/04/18 14:05	10/12/18 02:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*40*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C5-PFPeA DNU	*54*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C2 PFHxA	*78*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C4 PFHpA	*87*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C4 PFOA	*109*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C5 PFNA	*117*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C2 PFDA	*107*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C2 PFUnA	*120*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C2 PFDoA	*113*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C2 PFTeDA	*100*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C3 PFBS	*71*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
18O2 PFHxS	*109*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*
13C4 PFOS	*116*		*25 - 150*	*10/04/18 14:05*	*10/12/18 02:00*	*1*

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dam 10/29/18

Client Sample ID: MW-4S

Date Collected: 09/25/18 14:30
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	75		25 - 150	10/04/18 14:05	10/12/18 02:00	1
d3-NMeFOSAA	101		25 - 150	10/04/18 14:05	10/12/18 02:00	1
d5-NEtFOSAA	111		25 - 150	10/04/18 14:05	10/12/18 02:00	1
M2-6:2 FTS	215	*	25 - 150	10/04/18 14:05	10/12/18 02:00	1
M2-8:2 FTS	175	*	25 - 150	10/04/18 14:05	10/12/18 02:00	1

Client Sample ID: MW-7S

Date Collected: 09/25/18 15:25
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 19:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	40		10 - 150	09/29/18 06:51	09/29/18 19:11	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**8.82**	**B**	1.79	0.37	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluoropentanoic acid (PFPeA)	**5.12**	**J**	1.79	0.67	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorohexanoic acid (PFHxA)	**9.05**	**B**	1.79	0.22	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluoroheptanoic acid (PFHpA)	**6.96**		1.79	0.29	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorooctanoic acid (PFOA)	**16.7**		1.79	0.29	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorononanoic acid (PFNA)	**1.13**	**J**	1.79	0.34	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorodecanoic acid (PFDA)	**0.72**	**J**	1.79	0.34	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluoroundecanoic acid (PFUnA)	1.79	U	1.79	0.22	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorododecanoic acid (PFDoA)	1.79	U	1.79	0.31	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorotridecanoic acid (PFTriA)	1.79	U	1.79	0.22	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorotetradecanoic acid (PFTeA)	1.79	U	1.79	0.40	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorobutanesulfonic acid (PFBS)	**20.8**	**B**	1.79	0.39	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorohexanesulfonic acid (PFHxS)	**44.6**	**B**	1.79	0.23	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluoroheptanesulfonic Acid (PFHpS)	**11.7**		1.79	0.74	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorooctanesulfonic acid (PFOS)	**1630**	**B**	17.9	6.82	ng/L		10/04/18 14:05	10/12/18 02:47	10
Perfluorodecanesulfonic acid (PFDS)	1.79	U	1.79	0.48	ng/L		10/04/18 14:05	10/12/18 07:50	1
Perfluorooctanesulfonamide (FOSA)	1.79	U	1.79	0.50	ng/L		10/04/18 14:05	10/12/18 07:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.9	U	17.9	0.40	ng/L		10/04/18 14:05	10/12/18 07:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**7.76**	**J**	17.9	0.63	ng/L		10/04/18 14:05	10/12/18 07:50	1
6:2 FTS	17.9	U	17.9	0.90	ng/L		10/04/18 14:05	10/12/18 07:50	1
8:2 FTS	17.9	U	17.9	0.50	ng/L		10/04/18 14:05	10/12/18 07:50	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	40		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C5-PFPeA DNU	36		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C2 PFHxA	84		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C4 PFHpA	87		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C4 PFOA	112		25 - 150	10/04/18 14:05	10/12/18 07:50	1

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Client Sample ID: MW-7S

Date Collected: 09/25/18 15:25
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	103		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C2 PFDA	115		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C2 PFUnA	134		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C2 PFDoA	136		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C2 PFTeDA	155	*	25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C3 PFBS	79		25 - 150	10/04/18 14:05	10/12/18 07:50	1
18O2 PFHxS	128		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C4 PFOS	80		25 - 150	10/04/18 14:05	10/12/18 07:50	1
13C8 FOSA	76		25 - 150	10/04/18 14:05	10/12/18 02:47	10
d3-NMeFOSAA	108		25 - 150	10/04/18 14:05	10/12/18 07:50	1
d5-NEtFOSAA	121		25 - 150	10/04/18 14:05	10/12/18 07:50	1
M2-6:2 FTS	307	*	25 - 150	10/04/18 14:05	10/12/18 07:50	1
M2-8:2 FTS	267	*	25 - 150	10/04/18 14:05	10/12/18 07:50	1

Client Sample ID: MW-1

Date Collected: 09/25/18 16:20
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 19:28	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	35		10 - 150	09/29/18 06:51	09/29/18 19:28	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**25.0**	**B**	1.74	0.36	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluoropentanoic acid (PFPeA)	**3.48**	**J**	1.74	0.65	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorohexanoic acid (PFHxA)	**6.37**	**B**	1.74	0.21	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluoroheptanoic acid (PFHpA)	**2.86**		1.74	0.28	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorooctanoic acid (PFOA)	**4.09**		1.74	0.28	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorononanoic acid (PFNA)	**2.48**		1.74	0.33	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorodecanoic acid (PFDA)	**2.05**		1.74	0.33	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluoroundecanoic acid (PFUnA)	**0.75**	**J**	1.74	0.22	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorododecanoic acid (PFDoA)	1.74	U	1.74	0.31	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorotridecanoic acid (PFTriA)	1.74	U	1.74	0.21	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorotetradecanoic acid (PFTeA)	1.74	U	1.74	0.39	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorobutanesulfonic acid (PFBS)	**9.02**	**B J**	1.74	0.38	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.10 J B~~	1.74 U	1.74	0.23	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.74	U	1.74	0.72	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorooctanesulfonic acid (PFOS)	**13.3**	**B J**	1.74	0.66	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorodecanesulfonic acid (PFDS)	1.74	U	1.74	0.46	ng/L		10/04/18 14:05	10/12/18 03:03	1
Perfluorooctanesulfonamide (FOSA)	**0.74**	**J**	1.74	0.49	ng/L		10/04/18 14:05	10/12/18 03:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.4	U	17.4	0.39	ng/L		10/04/18 14:05	10/12/18 03:03	1

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Client Sample ID: MW-1

Date Collected: 09/25/18 16:20
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.21	J	17.4	0.61	ng/L		10/04/18 14:05	10/12/18 03:03	1
6:2 FTS	0.99	J	17.4	0.87	ng/L		10/04/18 14:05	10/12/18 03:03	1
8:2 FTS	17.4	U	17.4	0.49	ng/L		10/04/18 14:05	10/12/18 03:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*33*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C5-PFPeA DNU	*24*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C2 PFHxA	*52*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C4 PFHpA	*72*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C4 PFOA	*105*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C5 PFNA	*138*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C2 PFDA	*116*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C2 PFUnA	*140*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C2 PFDoA	*133*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C2 PFTeDA	*113*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C3 PFBS	*93*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
18O2 PFHxS	*131*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C4 PFOS	*161*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
13C8 FOSA	*94*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
d3-NMeFOSAA	*116*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
d5-NEtFOSAA	*132*		*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
M2-6:2 FTS	*321*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*
M2-8:2 FTS	*345*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 03:03*	*1*

Client Sample ID: MW-XX-092518

Date Collected: 09/25/18 00:00
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 19:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*34*		*10 - 150*	*09/29/18 06:51*	*09/29/18 19:45*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	7.44	B J	1.80	0.37	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluoropentanoic acid (PFPeA)	8.88	J	1.80	0.67	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorohexanoic acid (PFHxA)	9.89	B	1.80	0.22	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluoroheptanoic acid (PFHpA)	6.08		1.80	0.29	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorooctanoic acid (PFOA)	17.2		1.80	0.29	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorononanoic acid (PFNA)	1.34	J	1.80	0.34	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorodecanoic acid (PFDA)	0.81	J	1.80	0.34	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluoroundecanoic acid (PFUnA)	1.80	U	1.80	0.22	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorododecanoic acid (PFDoA)	1.80	U	1.80	0.31	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorotridecanoic acid (PFTriA)	1.80	U	1.80	0.22	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorotetradecanoic acid (PFTeA)	1.80	U	1.80	0.40	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorobutanesulfonic acid (PFBS)	21.0	B	1.80	0.39	ng/L		10/04/18 14:05	10/12/18 08:05	1

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Client Sample ID: MW-XX-092518

Date Collected: 09/25/18 00:00
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	41.0	B	1.80	0.23	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	14.6		1.80	0.74	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorooctanesulfonic acid (PFOS)	1170	B J	18.0	6.82	ng/L		10/04/18 14:05	10/12/18 03:19	10
Perfluorodecanesulfonic acid (PFDS)	1.80	U	1.80	0.48	ng/L		10/04/18 14:05	10/12/18 08:05	1
Perfluorooctanesulfonamide (FOSA)	0.83	J	1.80	0.50	ng/L		10/04/18 14:05	10/12/18 08:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.0	U	18.0	0.40	ng/L		10/04/18 14:05	10/12/18 08:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	7.59	J	18.0	0.63	ng/L		10/04/18 14:05	10/12/18 08:05	1
6:2 FTS	1.03	J	18.0	0.90	ng/L		10/04/18 14:05	10/12/18 08:05	1
8:2 FTS	18.0	U	18.0	0.50	ng/L		10/04/18 14:05	10/12/18 08:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	39		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C5-PFPeA DNU	38		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C2 PFHxA	80		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C4 PFHpA	84		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C4 PFOA	107		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C5 PFNA	105		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C2 PFDA	116		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C2 PFUnA	132		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C2 PFDoA	145		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C2 PFTeDA	177	*	25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C3 PFBS	84		25 - 150	10/04/18 14:05	10/12/18 08:05	1
18O2 PFHxS	133		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C4 PFOS	128		25 - 150	10/04/18 14:05	10/12/18 08:05	1
13C8 FOSA	98		25 - 150	10/04/18 14:05	10/12/18 03:19	10
d3-NMeFOSAA	114		25 - 150	10/04/18 14:05	10/12/18 08:05	1
d5-NEtFOSAA	130		25 - 150	10/04/18 14:05	10/12/18 08:05	1
M2-6:2 FTS	330	*	25 - 150	10/04/18 14:05	10/12/18 08:05	1
M2-8:2 FTS	296	*	25 - 150	10/04/18 14:05	10/12/18 08:05	1

Client Sample ID: FB-092518

Date Collected: 09/25/18 17:55
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		09/29/18 06:51	09/29/18 20:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	37		10 - 150	09/29/18 06:51	09/29/18 20:02	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~0.45~~ 1.72U	~~J B~~	1.72	0.35	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluoropentanoic acid (PFPeA)	1.72	U	1.72	0.64	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorohexanoic acid (PFHxA)	~~0.31~~ 1.72U	~~J B~~	1.72	0.21	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluoroheptanoic acid (PFHpA)	1.72	U	1.72	0.27	ng/L		10/04/18 14:05	10/12/18 03:35	1

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Client Sample ID: FB-092518
Date Collected: 09/25/18 17:55
Date Received: 09/26/18 19:30

Lab Sample ID: 460-165575-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.72	U	1.72	0.27	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorononanoic acid (PFNA)	1.72	U	1.72	0.33	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorodecanoic acid (PFDA)	1.72	U	1.72	0.33	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluoroundecanoic acid (PFUnA)	1.72	U	1.72	0.21	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorododecanoic acid (PFDoA)	1.72	U	1.72	0.30	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorotridecanoic acid (PFTriA)	1.72	U	1.72	0.21	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorotetradecanoic acid (PFTeA)	1.72	U	1.72	0.39	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorobutanesulfonic acid (PFBS)	~~1.04~~ ~~J B~~	1.72 U	1.72	0.38	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.25~~ ~~J B~~	1.72 U	1.72	0.22	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.72	U	1.72	0.70	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorooctanesulfonic acid (PFOS)	~~0.99~~ ~~J B~~	1.72 U	1.72	0.65	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorodecanesulfonic acid (PFDS)	1.72	U	1.72	0.46	ng/L		10/04/18 14:05	10/12/18 03:35	1
Perfluorooctanesulfonamide (FOSA)	1.72	U	1.72	0.48	ng/L		10/04/18 14:05	10/12/18 03:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.2	U	17.2	0.39	ng/L		10/04/18 14:05	10/12/18 03:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.2	U	17.2	0.60	ng/L		10/04/18 14:05	10/12/18 03:35	1
6:2 FTS	17.2	U	17.2	0.86	ng/L		10/04/18 14:05	10/12/18 03:35	1
8:2 FTS	17.2	U	17.2	0.48	ng/L		10/04/18 14:05	10/12/18 03:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	140		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C5-PFPeA DNU	91		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C2 PFHxA	142		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C4 PFHpA	105		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C4 PFOA	115		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C5 PFNA	123		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C2 PFDA	94		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C2 PFUnA	106		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C2 PFDoA	99		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C2 PFTeDA	73		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C3 PFBS	120		25 - 150	10/04/18 14:05	10/12/18 03:35	1
18O2 PFHxS	123		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C4 PFOS	136		25 - 150	10/04/18 14:05	10/12/18 03:35	1
13C8 FOSA	86		25 - 150	10/04/18 14:05	10/12/18 03:35	1
d3-NMeFOSAA	86		25 - 150	10/04/18 14:05	10/12/18 03:35	1
d5-NEtFOSAA	97		25 - 150	10/04/18 14:05	10/12/18 03:35	1
M2-6:2 FTS	105		25 - 150	10/04/18 14:05	10/12/18 03:35	1
M2-8:2 FTS	111		25 - 150	10/04/18 14:05	10/12/18 03:35	1

DRAFT

Company: GEI Consultants, Inc.

Address: 455 Winding Brook Drive Suite 201

City: Glastonbury

State, Zip: CT, 06033

Phone: 860-368-5300(Tel) 860-808-9717(Fax)

Email: rmelter@geiconsultants.com

Project Name: Emerging Contaminants - Long Island/NYC

Site/Project Description: Patchogue-PFAS-1803556-1.3

Due Date Requested:

TAT Requested (days): 10 days

PO #: 1803556-1.3

WO #:

Project #: 46027288

SSOW#:

Analysis Requested

Job #:

Preservation Codes: A - HCL, B - NaOH, C - Zn Acet, D - Nitric Ac

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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions
				Preservation Code:			N	N		
MW-4S	9-25-18	1430	G	Water			X	X	12	MS,
MW-7S	9-25-18	1525	G	Water			X	X	4	2
MW-1	9-25-18	1620	G	Water			X	X	4	3
MW-XX-092518	9-25-18	—	G	Water			X	X	4	4
FB-092518	9-25-18	1755	G	Water			X	X	4	5
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						

460-165575 Chain of Custody

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

Sample Disposal (A fee may be assessed ... samples are retained longer t: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For

Deliverable Requested: I, II, III, IV, Other (specify) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into on

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

Relinquished by	Date/Time	Company	Received by	Date/Time
[signature]	9/26/18 1210	GEI	[signature]	9/26/18 12
[signature]	9/26/18 19:30	FedEx	[signature]	9/26/18 19:
	Date/Time:	Company	Received by:	Date/Time:

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

Cooler Temperature(s) °C and Other Remarks:

2.5 / 2.5 4.0 / 4.0 ITW 4

DRAFT

Site: Long Island Emerging Contaminants, Peoples
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165639
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
PWMW-01	460-165639-01	PFAS, 1,4-Dioxane
MW-11	460-165639-02	PFAS, 1,4-Dioxane
MW-9	460-165639-03	PFAS, 1,4-Dioxane
MW-XX-092618	460-165639-04	PFAS, 1,4-Dioxane
FB-092618	460-165639-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: Fieldblank-092618
Field Duplicate pair: MW-11/MW-XX-092618

The above-listed aqueous samples and field blank sample were collected on September 26, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were not detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorobutanoic acid (PFBA)	Method MB 200-134832: All samples	0.881 ng/L	8.81 ng/L	Qualify the result for PFBA in samples MW-9 and FB-092618 as nondetect (U) at the RL. Qualify the result for PFBA in sample PWMW-01 as estimated (J); High bias.
Perfluorohexanoic acid (PFHxA)		0.407 ng/L	4.07 ng/L	Qualify the result for PFHxA in sample FB-092618 as nondetect (U) at the RL. Qualify the result for PFHxA in sample MW-9 as estimated (J); High bias.
Perfluorobutanesulfonic acid (PFBS)		1.178 ng/L	11.78 ng/L	Qualify the result for PFBS in sample FB-092618 as nondetect (U) at the RL. Qualify the result for PFBS in samples PWMW-01, MW-11, MW-9, and MW-XX-092618 as estimated (J); High bias.
Perfluorohexanesulfonic acid (PFHxS)		0.559 ng/L	5.59 ng/L	Qualify the result for PFHxS in samples MW-11, MW-9, MW-XX-092618, and FB-092618 as nondetect (U) at the RL. Qualify the result for PFHxS in sample PWMW-01 as estimated (J); High bias.
Perfluorooctanesulfonic acid (PFOS)		1.143 ng/L	11.43 ng/L	Qualify the result for PFOS in samples MW-11, MW-9, and MW-XX-092618 as estimated (J); High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.

DRAFT

If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
PWMW-01	M2-6:2 FTS	172	25-150	Validation action was not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.
MW-11	M2-6:2 FTS	280	25-150	Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	236		
MW-9	M2-6:2 FTS	183	25-150	Estimate (J) the positive result for 6:2 FTS in sample MW-9.
	M2-8:2 FTS	191		Validation action was not required as the result for 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
MW-XX-092618	13C5 PFNA	157	25-150	Estimate (J) the positive result for Perfluorononanoic acid (PFNA) in sample MW-XX-092618.
	M2-6:2 FTS	286		Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	257		
FB-092618	PFBA	178	25-150	Validation action was not required as the result for PFBA was not detected in this sample and therefore not affected by the high recovery.

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It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample PWMW-01 for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples MW-11 and MW-XX-092618 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW-11 (ug/L)	MW-XX-092618 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	14.0	14.1	0.7
Perfluoropentanoic (PFPeA)	12.8	15.6	19.7
Perfluorohexanoic acid (PFHxA)	5.85	6.66	13.0
Perfluoroheptanoic acid (PFHpA)	4.12	4.26	3.3
Perfluorooctanoic acid (PFOA)	38.4	38.1	0.8
Perfluorononanoic acid (PFNA)	1.32 J	1.17 J	12.0
Perfluoroundecanoic acid (PFUnA)	0.23 J	1.76 U	NC, Within the RL
Perfluorobutanesulfonic acid (PFBS)	11.0	9.87	10.8
Perfluoroheptanesulfonic Acid (PFHpS)	1.75 U	1.15 J	NC, Within the RL
Perfluorooctanesulfonic acid (PFOS)	3.14	2.39	27.1
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DRAFT

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Peoples - PFAS - 1803556-1.20

TestAmerica Job ID: 460-165639-1

Client Sample ID: PWMW-01
Date Collected: 09/26/18 09:00
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 09:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*36*		*10 - 150*	*10/01/18 11:31*	*10/02/18 09:44*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.14**	B J.	1.72	0.35	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluoropentanoic acid (PFPeA)	**15.9**		1.72	0.65	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorohexanoic acid (PFHxA)	**8.65**	B	1.72	0.21	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluoroheptanoic acid (PFHpA)	**8.92**		1.72	0.28	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorooctanoic acid (PFOA)	**42.6**		1.72	0.28	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorononanoic acid (PFNA)	**1.54**	J.	1.72	0.33	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorodecanoic acid (PFDA)	1.72	U	1.72	0.33	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluoroundecanoic acid (PFUnA)	1.72	U	1.72	0.22	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorododecanoic acid (PFDoA)	1.72	U	1.72	0.30	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorotridecanoic acid (PFTriA)	1.72	U	1.72	0.21	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorotetradecanoic acid (PFTeA)	1.72	U	1.72	0.39	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorobutanesulfonic acid (PFBS)	**4.70**	B J.	1.72	0.38	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorohexanesulfonic acid (PFHxS)	**2.27**	B J.	1.72	0.22	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.72	U	1.72	0.71	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorooctanesulfonic acid (PFOS)	**20.4**	B	1.72	0.65	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorodecanesulfonic acid (PFDS)	1.72	U	1.72	0.46	ng/L		10/04/18 14:05	10/12/18 05:58	1
Perfluorooctanesulfonamide (FOSA)	1.72	U	1.72	0.48	ng/L		10/04/18 14:05	10/12/18 05:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.2	U	17.2	0.39	ng/L		10/04/18 14:05	10/12/18 05:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.2	U	17.2	0.60	ng/L		10/04/18 14:05	10/12/18 05:58	1
6:2 FTS	17.2	U	17.2	0.86	ng/L		10/04/18 14:05	10/12/18 05:58	1
8:2 FTS	17.2	U	17.2	0.48	ng/L		10/04/18 14:05	10/12/18 05:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*76*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C5-PFPeA DNU	*55*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C2 PFHxA	*104*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C4 PFHpA	*92*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C4 PFOA	*104*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C5 PFNA	*120*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C2 PFDA	*90*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C2 PFUnA	*106*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C2 PFDoA	*107*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C3 PFBS	*99*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
18O2 PFHxS	*132*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C4 PFOS	*143*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
13C8 FOSA	*119*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
d3-NMeFOSAA	*91*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*10/04/18 14:05*	*10/12/18 05:58*	*1*

DRAFT

Am 10/29/18

Client Sample ID: PWMW-01

Date Collected: 09/26/18 09:00
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	172	*	25 - 150	10/04/18 14:05	10/12/18 05:58	1
M2-8:2 FTS	141		25 - 150	10/04/18 14:05	10/12/18 05:58	1

Client Sample ID: MW-11

Date Collected: 09/26/18 10:05
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 10:02	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	36		10 - 150	10/01/18 11:31	10/02/18 10:02	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**14.0**	B	1.75	0.36	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluoropentanoic acid (PFPeA)	**12.8**		1.75	0.66	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorohexanoic acid (PFHxA)	**5.85**	B	1.75	0.21	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluoroheptanoic acid (PFHpA)	**4.12**		1.75	0.28	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorooctanoic acid (PFOA)	**38.4**		1.75	0.28	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorononanoic acid (PFNA)	**1.32**	J	1.75	0.33	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorodecanoic acid (PFDA)	1.75	U	1.75	0.33	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluoroundecanoic acid (PFUnA)	**0.23**	J	1.75	0.22	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorododecanoic acid (PFDoA)	1.75	U	1.75	0.31	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorotridecanoic acid (PFTriA)	1.75	U	1.75	0.21	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorotetradecanoic acid (PFTeA)	1.75	U	1.75	0.39	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorobutanesulfonic acid (PFBS)	**11.0**	B J	1.75	0.39	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.93~~ ~~J B~~	1.75 U	1.75	0.23	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.75	U	1.75	0.72	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorooctanesulfonic acid (PFOS)	**3.14**	B J	1.75	0.67	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorodecanesulfonic acid (PFDS)	1.75	U	1.75	0.46	ng/L		10/04/18 14:05	10/12/18 06:46	1
Perfluorooctanesulfonamide (FOSA)	1.75	U	1.75	0.49	ng/L		10/04/18 14:05	10/12/18 06:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.5	U	17.5	0.39	ng/L		10/04/18 14:05	10/12/18 06:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.5	U	17.5	0.61	ng/L		10/04/18 14:05	10/12/18 06:46	1
6:2 FTS	17.5	U	17.5	0.88	ng/L		10/04/18 14:05	10/12/18 06:46	1
8:2 FTS	17.5	U	17.5	0.49	ng/L		10/04/18 14:05	10/12/18 06:46	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	28		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C5-PFPeA DNU	37		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C2 PFHxA	102		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C4 PFHpA	78		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C4 PFOA	112		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C5 PFNA	142		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C2 PFDA	99		25 - 150	10/04/18 14:05	10/12/18 06:46	1

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Client Sample ID: MW-11

Date Collected: 09/26/18 10:05
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	103		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C2 PFDoA	97		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C2 PFTeDA	103		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C3 PFBS	73		25 - 150	10/04/18 14:05	10/12/18 06:46	1
18O2 PFHxS	97		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C4 PFOS	117		25 - 150	10/04/18 14:05	10/12/18 06:46	1
13C8 FOSA	58		25 - 150	10/04/18 14:05	10/12/18 06:46	1
d3-NMeFOSAA	95		25 - 150	10/04/18 14:05	10/12/18 06:46	1
d5-NEtFOSAA	98		25 - 150	10/04/18 14:05	10/12/18 06:46	1
M2-6:2 FTS	280	*	25 - 150	10/04/18 14:05	10/12/18 06:46	1
M2-8:2 FTS	236	*	25 - 150	10/04/18 14:05	10/12/18 06:46	1

Client Sample ID: MW-9

Date Collected: 09/26/18 11:15
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 10:19	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	36		10 - 150	10/01/18 11:31	10/02/18 10:19	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~1.30~~	~~J B~~ 1.73 U	1.73	0.35	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluoropentanoic acid (PFPeA)	3.78		1.73	0.65	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorohexanoic acid (PFHxA)	3.44	B J	1.73	0.21	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluoroheptanoic acid (PFHpA)	2.20		1.73	0.28	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorooctanoic acid (PFOA)	7.15		1.73	0.28	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorononanoic acid (PFNA)	0.84	J	1.73	0.33	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorodecanoic acid (PFDA)	1.84		1.73	0.33	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluoroundecanoic acid (PFUnA)	1.83		1.73	0.22	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorododecanoic acid (PFDoA)	1.96		1.73	0.30	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorotridecanoic acid (PFTriA)	2.70		1.73	0.21	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorotetradecanoic acid (PFTeA)	0.94	J	1.73	0.39	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorobutanesulfonic acid (PFBS)	2.90	B J	1.73	0.38	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.32~~	~~J B~~ 1.73 U	1.73	0.22	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.73	U	1.73	0.71	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorooctanesulfonic acid (PFOS)	10.6	B J	1.73	0.66	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorodecanesulfonic acid (PFDS)	3.81		1.73	0.46	ng/L		10/04/18 14:05	10/12/18 07:02	1
Perfluorooctanesulfonamide (FOSA)	1.43	J	1.73	0.48	ng/L		10/04/18 14:05	10/12/18 07:02	1

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Client Sample ID: MW-9

Date Collected: 09/26/18 11:15
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.3	U	17.3	0.39	ng/L		10/04/18 14:05	10/12/18 07:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.3	U	17.3	0.61	ng/L		10/04/18 14:05	10/12/18 07:02	1
6:2 FTS	**2.65**	J	17.3	0.87	ng/L		10/04/18 14:05	10/12/18 07:02	1
8:2 FTS	17.3	U	17.3	0.48	ng/L		10/04/18 14:05	10/12/18 07:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*43*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C5-PFPeA DNU	*45*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C2 PFHxA	*102*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C4 PFHpA	*88*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C4 PFOA	*109*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C5 PFNA	*127*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C2 PFDA	*71*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C2 PFUnA	*99*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C2 PFDoA	*92*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C2 PFTeDA	*96*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
18O2 PFHxS	*113*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C4 PFOS	*125*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
13C8 FOSA	*63*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
d5-NEtFOSAA	*85*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
M2-6:2 FTS	*183*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*
M2-8:2 FTS	*191*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 07:02*	*1*

Client Sample ID: MW-XX-092618

Date Collected: 09/26/18 00:00
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 10:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*38*		*10 - 150*	*10/01/18 11:31*	*10/02/18 10:37*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**14.1**	B	1.76	0.36	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluoropentanoic acid (PFPeA)	**15.6**		1.76	0.66	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorohexanoic acid (PFHxA)	**6.66**	B	1.76	0.21	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluoroheptanoic acid (PFHpA)	**4.26**		1.76	0.28	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorooctanoic acid (PFOA)	**38.1**		1.76	0.28	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorononanoic acid (PFNA)	**1.17**	J	1.76	0.34	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorodecanoic acid (PFDA)	1.76	U	1.76	0.34	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluoroundecanoic acid (PFUnA)	1.76	U	1.76	0.22	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/04/18 14:05	10/12/18 07:18	1

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Client Sample ID: MW-XX-092618

Date Collected: 09/26/18 00:00
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	9.87	~~B~~ J ·	1.76	0.39	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorohexanesulfonic acid (PFHxS)	~~1.23 J B~~	1.76 U ·	1.76	0.23	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.15	J ·	1.76	0.72	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorooctanesulfonic acid (PFOS)	2.39	~~B~~ J ·	1.76	0.67	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/04/18 14:05	10/12/18 07:18	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/04/18 14:05	10/12/18 07:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/04/18 14:05	10/12/18 07:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/04/18 14:05	10/12/18 07:18	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/04/18 14:05	10/12/18 07:18	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/04/18 14:05	10/12/18 07:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*28*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C5-PFPeA DNU	*33*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C2 PFHxA	*99*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C4 PFOA	*112*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C5 PFNA	*157*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C2 PFDA	*99*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C2 PFUnA	*103*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C2 PFDoA	*101*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C2 PFTeDA	*102*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C3 PFBS	*81*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
18O2 PFHxS	*99*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C4 PFOS	*122*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
13C8 FOSA	*49*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
d3-NMeFOSAA	*95*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
d5-NEtFOSAA	*92*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
M2-6:2 FTS	*286*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*
M2-8:2 FTS	*257*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 07:18*	*1*

Client Sample ID: FB-092618

Date Collected: 09/26/18 11:25
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 10:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*38*		*10 - 150*	*10/01/18 11:31*	*10/02/18 10:54*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~0.45 J B~~	1.69 U ·	1.69	0.35	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluoropentanoic acid (PFPeA)	1.69	U	1.69	0.63	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorohexanoic acid (PFHxA)	~~0.31 J B~~	1.69 U ·	1.69	0.20	ng/L		10/04/18 14:05	10/12/18 07:34	1

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Client Sample ID: FB-092618
Date Collected: 09/26/18 11:25
Date Received: 09/27/18 20:00

Lab Sample ID: 460-165639-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	1.69	U	1.69	0.27	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorooctanoic acid (PFOA)	1.69	U	1.69	0.27	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorononanoic acid (PFNA)	1.69	U	1.69	0.32	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorodecanoic acid (PFDA)	1.69	U	1.69	0.32	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluoroundecanoic acid (PFUnA)	1.69	U	1.69	0.21	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorododecanoic acid (PFDoA)	1.69	U	1.69	0.30	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorotridecanoic acid (PFTrIA)	1.69	U	1.69	0.20	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorotetradecanoic acid (PFTeA)	1.69	U	1.69	0.38	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorobutanesulfonic acid (PFBS)	~~1.08~~	~~J B~~ 1.69U	1.69	0.37	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.45~~	~~J B~~ 1.69U	1.69	0.22	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.69	U	1.69	0.69	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorooctanesulfonic acid (PFOS)	1.69	U	1.69	0.64	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorodecanesulfonic acid (PFDS)	1.69	U	1.69	0.45	ng/L		10/04/18 14:05	10/12/18 07:34	1
Perfluorooctanesulfonamide (FOSA)	1.69	U	1.69	0.47	ng/L		10/04/18 14:05	10/12/18 07:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.9	U	16.9	0.38	ng/L		10/04/18 14:05	10/12/18 07:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.9	U	16.9	0.59	ng/L		10/04/18 14:05	10/12/18 07:34	1
6:2 FTS	16.9	U	16.9	0.85	ng/L		10/04/18 14:05	10/12/18 07:34	1
8:2 FTS	16.9	U	16.9	0.47	ng/L		10/04/18 14:05	10/12/18 07:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*178*	*	*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C5-PFPeA DNU	*92*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C2 PFHxA	*148*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C4 PFHpA	*101*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C4 PFOA	*115*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C5 PFNA	*125*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C2 PFDA	*94*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C2 PFUnA	*108*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C2 PFDoA	*109*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C3 PFBS	*123*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
18O2 PFHxS	*115*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C4 PFOS	*132*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
13C8 FOSA	*99*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
d3-NMeFOSAA	*87*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
M2-6:2 FTS	*121*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*
M2-8:2 FTS	*121*		*25 - 150*	*10/04/18 14:05*	*10/12/18 07:34*	*1*

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Company: GEI Consultants, Inc.

Address: 455 Winding Brook Drive Suite 201
City: Glastonbury
State, Zip: CT, 06033
Phone: 860-368-5300(Tel) 860-608-9717(Fax)
Email: mfelter@geiconsultants.com
Project Name: Emerging Contaminants - Long Island/NYC
Site/Project Description: Peoples-PFAS-1803556-1.20

Due Date Requested:
TAT Requested (days): 10 days
PO #: 1803556-1.20
WO #:
Project #: 46027288
SSOW#:

Analysis Requested

Job #: 16

Preservation
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic A
I - Ice
J - DI Water
K - EDTA
L - EDA
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastelol, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	SUB Work	Total Number of containers	Speci
			Preservation Code:				N	N			
PWMW-01	9-26-18	0900	G	Water			X	X		12	M
MW-11	9-26-18	1005	G	Water			X	X		4	
MW-9	9-26-18	1115	G	Water			X	X		4	
MW-XX-092618	9-26-18	—	G	Water			X	X		4	
FB-092618	9-26-18	1125	G	Water			X	X		4	
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							

460-165639 Chain of

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

Sample Disposal (A fee may be assessed if samples are retained longer t
☐ Return To Client ☐ Disposal By Lab ☐ Archive For

Deliverable Requested: I, II, III, IV, Other (specify) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into on

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

Relinquished by	Date/Time	Company	Received by	Date/Time
Matthew Cusick	9/27/18 1200	GEI		9/27/18 12
	9/27/18 2045	T-V	Kelly Jo	9/28/18 0
	Date/Time:	Company	Received by:	Date/Time:

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

Cooler Temperature(s) °C and Other Remarks:

3.2 / 3.2 3.7 / 3.4 TRO

DRAFT

Site: Long Island Emerging Contaminants, Rockaway
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165833
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW-02S	460-165833-01	PFAS, 1,4-Dioxane
RW-05A	460-165833-02	PFAS, 1,4-Dioxane
MW-26S	460-165833-03	PFAS, 1,4-Dioxane
MW-XX-092818	460-165833-04	PFAS, 1,4-Dioxane
FB-092818	460-165833-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-092818
Field Duplicate pair: RW-05A/MW-XX-092818

The above-listed aqueous samples and field blank sample were collected on September 28, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were not detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorobutanoic acid (PFBA)	Method MB 200-134946: All samples	1.22 ng/L	12.2 ng/L	Qualify the result for PFBA in sample FB-092818 as nondetect (U) at the RL.
Perfluorooctanoic acid (PFOA)		0.392 ng/L	3.92 ng/L	Validation actions were not required.
Perfluorohexanesulfonic acid (PFHxS)		0.356 ng/L	3.56 ng/L	Qualify the result for PFHxS in sample RW-05A as nondetect (U) at the RL. Qualify the result for PFHxS in sample MW-26S as estimated (J); High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

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Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW-02S	13C4-PFBA	16	25-150	Estimate (J) the positive result for Perfluorobutanoic acid (PFBA) in sample MW-02S.
	M2-6:2 FTS	209		Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	245		
RW-05A	13C4-PFBA	22	25-150	Estimate (J) the positive result for Perfluorobutanoic acid (PFBA) in sample RW-05A.
	M2-6:2 FTS	180		Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	204		
MW-XX-092818	13C4-PFBA	20	25-150	Estimate (J) the positive result for Perfluorobutanoic acid (PFBA) in sample MW-XX-092818.
	M2-6:2 FTS	191		Validation action was not required as the results for 6:2 FTS and 8:2 FTS were not detected in this sample and therefore not affected by the high recoveries.
	M2-8:2 FTS	200		

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW-02S. Recovery and precision criteria were met for 1,4-dioxane. Perfluorooctanesulfonic acid (PFOS) (267%) was recovered above the control limits of 40-160 in the MS. The positive result for Perfluorooctanesulfonic acid was qualified as estimated (J) in sample MW-02S and may be biased high.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples RW-05A and MW-XX-092818 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria except for Perfluorohexanoic acid (PFHxA) and Perfluorobutanesulfonic acid (PFBS). The positive results for Perfluorohexanoic acid (PFHxA)

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and Perfluorobutanesulfonic acid (PFBS) in samples RW-05A and MW-XX-092818 were qualified as estimated (J). The direction of the bias cannot be determined from this nonconformance.

Analyte	RW-05A (ug/L)	MW-XX-092818 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	148	115	25.1
Perfluoropentanoic acid (PFPeA)	12.7	16.8	27.8
Perfluorohexanoic acid (PFHxA)	7.39	3.90	**61.8**
Perfluoroheptanoic acid (PFHpA)	4.68 J	3.74	22.3
Perfluorooctanoic acid (PFOA)	15.5	17.5	12.1
Perfluorononanoic acid (PFNA)	1.53 J	1.28 J	17.8
Perfluorodecanoic acid (PFDA)	0.65 J	0.72 J	10.2
Perfluoroundecanoic acid (PFUnA)	0.39 J	0.39 J	0
Perfluorobutanesulfonic acid (PFBS)	2.57	6.25	**83.4**
Perfluorohexanesulfonic acid(PFHxS)	4.23 JB	3.82	10.2
Perfluorooctanesulfonic acid (PFOS)	8.99	9.15	1.8
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
MW-02S	A 5-fold dilution was performed for Perfluorohexanesulfonic acid (PFHxS), Perfluoroheptanoic acid (PFHpA), and Perfluorooctanoic acid (PFOA) due to sample matrix. All other results were reported from the undiluted analysis. Reporting limits were not adversely affected as the diluted results were detected.
RW-05A	A 5-fold dilution was performed for Perfluorohexanesulfonic acid (PFHxS), Perfluoroheptanoic acid (PFHpA), and Perfluorooctanoic acid (PFOA) due to sample matrix. All other results were reported from the undiluted analysis. Reporting limits were not adversely affected as the diluted results were detected.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

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Client Sample ID: MW-02S
Date Collected: 09/28/18 10:25
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/03/18 16:49	10/03/18 22:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*48*		*10 - 150*	*10/03/18 16:49*	*10/03/18 22:33*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**77.0**	B J	1.72	0.35	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluoropentanoic acid (PFPeA)	**25.2**		1.72	0.64	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorohexanoic acid (PFHxA)	**20.0**		1.72	0.21	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluoroheptanoic acid (PFHpA)	**11.5**		8.60	1.38	ng/L		10/08/18 09:18	10/13/18 17:29	5
Perfluorooctanoic acid (PFOA)	**51.9**	B	8.60	1.38	ng/L		10/08/18 09:18	10/13/18 17:29	5
Perfluorononanoic acid (PFNA)	**10.7**		1.72	0.33	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorodecanoic acid (PFDA)	**4.18**		1.72	0.33	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluoroundecanoic acid (PFUnA)	**0.90**	J	1.72	0.21	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorododecanoic acid (PFDoA)	1.72	U	1.72	0.30	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorotridecanoic acid (PFTriA)	1.72	U	1.72	0.21	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorotetradecanoic acid (PFTeA)	1.72	U	1.72	0.39	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorobutanesulfonic acid (PFBS)	**11.5**		1.72	0.38	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorohexanesulfonic acid (PFHxS)	**22.5**	B	8.60	1.12	ng/L		10/08/18 09:18	10/13/18 17:29	5
Perfluoroheptanesulfonic Acid (PFHpS)	**2.15**		1.72	0.70	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorooctanesulfonic acid (PFOS)	**122**	J	1.72	0.65	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorodecanesulfonic acid (PFDS)	**0.96**	J	1.72	0.46	ng/L		10/08/18 09:18	10/13/18 05:08	1
Perfluorooctanesulfonamide (FOSA)	**0.57**	J	1.72	0.48	ng/L		10/08/18 09:18	10/13/18 05:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.2	U	17.2	0.39	ng/L		10/08/18 09:18	10/13/18 05:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.2	U	17.2	0.60	ng/L		10/08/18 09:18	10/13/18 05:08	1
6:2 FTS	17.2	U	17.2	0.86	ng/L		10/08/18 09:18	10/13/18 05:08	1
8:2 FTS	17.2	U	17.2	0.48	ng/L		10/08/18 09:18	10/13/18 05:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*16*	*	*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C5-PFPeA DNU	*30*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C2 PFHxA	*34*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C4 PFHpA	*85*		*25 - 150*	*10/08/18 09:18*	*10/13/18 17:29*	*5*
13C4 PFOA	*101*		*25 - 150*	*10/08/18 09:18*	*10/13/18 17:29*	*5*
13C5 PFNA	*102*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C2 PFDA	*120*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C2 PFUnA	*143*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C2 PFDoA	*132*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C2 PFTeDA	*100*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C3 PFBS	*54*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
18O2 PFHxS	*87*		*25 - 150*	*10/08/18 09:18*	*10/13/18 17:29*	*5*
13C4 PFOS	*82*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*
13C8 FOSA	*60*		*25 - 150*	*10/08/18 09:18*	*10/13/18 05:08*	*1*

DRAFT

Client Sample ID: MW-02S

Date Collected: 09/28/18 10:25
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMeFOSAA	112		25 - 150	10/08/18 09:18	10/13/18 05:08	1
d5-NEtFOSAA	149		25 - 150	10/08/18 09:18	10/13/18 05:08	1
M2-6:2 FTS	209	*	25 - 150	10/08/18 09:18	10/13/18 05:08	1
M2-8:2 FTS	245	*	25 - 150	10/08/18 09:18	10/13/18 05:08	1

Client Sample ID: RW-05A

Date Collected: 09/28/18 11:20
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/03/18 16:49	10/03/18 23:08	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	50		10 - 150	10/03/18 16:49	10/03/18 23:08	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**148**	B J.	1.76	0.36	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluoropentanoic acid (PFPeA)	**12.7**		1.76	0.66	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorohexanoic acid (PFHxA)	**7.39**	J.	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluoroheptanoic acid (PFHpA)	**4.68**	J.	8.80	1.41	ng/L		10/08/18 09:18	10/13/18 18:17	5
Perfluorooctanoic acid (PFOA)	**15.5**	B	8.80	1.41	ng/L		10/08/18 09:18	10/13/18 18:17	5
Perfluorononanoic acid (PFNA)	**1.53**	J.	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorodecanoic acid (PFDA)	**0.65**	J.	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluoroundecanoic acid (PFUnA)	**0.39**	J.	1.76	0.22	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorobutanesulfonic acid (PFBS)	**2.57**	J.	1.76	0.39	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorohexanesulfonic acid (PFHxS)	~~4.23~~ J B	8.8 U.	8.80	1.14	ng/L		10/08/18 09:18	10/13/18 18:17	5
Perfluoroheptanesulfonic Acid (PFHpS)	1.76	U	1.76	0.72	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorooctanesulfonic acid (PFOS)	**8.99**		1.76	0.67	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/08/18 09:18	10/13/18 06:12	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/08/18 09:18	10/13/18 06:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/08/18 09:18	10/13/18 06:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/08/18 09:18	10/13/18 06:12	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/08/18 09:18	10/13/18 06:12	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/08/18 09:18	10/13/18 06:12	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	22	*	25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C5-PFPeA DNU	38		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C2 PFHxA	45		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C4 PFHpA	83		25 - 150	10/08/18 09:18	10/13/18 18:17	5
13C4 PFOA	103		25 - 150	10/08/18 09:18	10/13/18 18:17	5

DRAFT

Client Sample ID: RW-05A

Date Collected: 09/28/18 11:20
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	105		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C2 PFDA	110		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C2 PFUnA	120		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C2 PFDoA	103		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C2 PFTeDA	69		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C3 PFBS	63		25 - 150	10/08/18 09:18	10/13/18 06:12	1
18O2 PFHxS	87		25 - 150	10/08/18 09:18	10/13/18 06:12	1
13C4 PFOS	81		25 - 150	10/08/18 09:18	10/13/18 18:17	5
13C8 FOSA	45		25 - 150	10/08/18 09:18	10/13/18 06:12	1
d3-NMeFOSAA	100		25 - 150	10/08/18 09:18	10/13/18 06:12	1
d5-NEtFOSAA	125		25 - 150	10/08/18 09:18	10/13/18 06:12	1
M2-6:2 FTS	180	*	25 - 150	10/08/18 09:18	10/13/18 06:12	1
M2-8:2 FTS	204	*	25 - 150	10/08/18 09:18	10/13/18 06:12	1

Client Sample ID: MW-26S

Date Collected: 09/28/18 12:35
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/03/18 16:49	10/03/18 23:25	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	44		10 - 150	10/03/18 16:49	10/03/18 23:25	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**24.4**	B	1.76	0.36	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluoropentanoic acid (PFPeA)	**6.58**		1.76	0.66	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorohexanoic acid (PFHxA)	**4.82**		1.76	0.21	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluoroheptanoic acid (PFHpA)	**3.79**		1.76	0.28	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorooctanoic acid (PFOA)	**18.1**	B	1.76	0.28	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorononanoic acid (PFNA)	**1.08**	J	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorodecanoic acid (PFDA)	1.76	U	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluoroundecanoic acid (PFUnA)	**0.23**	J	1.76	0.22	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorobutanesulfonic acid (PFBS)	**3.76**		1.76	0.39	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorohexanesulfonic acid (PFHxS)	**2.48**	B J	1.76	0.23	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.76	U	1.76	0.72	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorooctanesulfonic acid (PFOS)	**13.6**		1.76	0.67	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/08/18 09:18	10/13/18 06:28	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/08/18 09:18	10/13/18 06:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/08/18 09:18	10/13/18 06:28	1

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Client Sample ID: MW-26S

Date Collected: 09/28/18 12:35
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/08/18 09:18	10/13/18 06:28	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/08/18 09:18	10/13/18 06:28	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/08/18 09:18	10/13/18 06:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	28		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C5-PFPeA DNU	40		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C2 PFHxA	53		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C4 PFHpA	78		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C4 PFOA	94		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C5 PFNA	97		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C2 PFDA	103		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C2 PFUnA	108		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C2 PFDoA	103		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C2 PFTeDA	73		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C3 PFBS	49		25 - 150	10/08/18 09:18	10/13/18 06:28	1
18O2 PFHxS	65		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C4 PFOS	63		25 - 150	10/08/18 09:18	10/13/18 06:28	1
13C8 FOSA	51		25 - 150	10/08/18 09:18	10/13/18 06:28	1
d3-NMeFOSAA	80		25 - 150	10/08/18 09:18	10/13/18 06:28	1
d5-NEtFOSAA	97		25 - 150	10/08/18 09:18	10/13/18 06:28	1
M2-6:2 FTS	141		25 - 150	10/08/18 09:18	10/13/18 06:28	1
M2-8:2 FTS	135		25 - 150	10/08/18 09:18	10/13/18 06:28	1

Client Sample ID: MW-XX-092818

Date Collected: 09/28/18 00:00
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/03/18 16:49	10/03/18 23:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	40		10 - 150	10/03/18 16:49	10/03/18 23:43	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**115**	B J.	1.75	0.36	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluoropentanoic acid (PFPeA)	**16.8**		1.75	0.66	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorohexanoic acid (PFHxA)	**3.90**	J.	1.75	0.21	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluoroheptanoic acid (PFHpA)	**3.74**		1.75	0.28	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorooctanoic acid (PFOA)	**17.5**	B	1.75	0.28	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorononanoic acid (PFNA)	**1.28**	J.	1.75	0.33	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorodecanoic acid (PFDA)	**0.72**	J.	1.75	0.33	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluoroundecanoic acid (PFUnA)	**0.39**	J.	1.75	0.22	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorododecanoic acid (PFDoA)	1.75	U	1.75	0.31	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorotridecanoic acid (PFTriA)	1.75	U	1.75	0.21	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorotetradecanoic acid (PFTeA)	1.75	U	1.75	0.39	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorobutanesulfonic acid (PFBS)	**6.25**	J.	1.75	0.39	ng/L		10/08/18 09:18	10/13/18 06:44	1

DRAFT

Client Sample ID: MW-XX-092818

Date Collected: 09/28/18 00:00
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**3.82**	**B**	1.75	0.23	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.75	U	1.75	0.72	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorooctanesulfonic acid (PFOS)	**9.15**		1.75	0.67	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorodecanesulfonic acid (PFDS)	1.75	U	1.75	0.46	ng/L		10/08/18 09:18	10/13/18 06:44	1
Perfluorooctanesulfonamide (FOSA)	1.75	U	1.75	0.49	ng/L		10/08/18 09:18	10/13/18 06:44	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.5	U	17.5	0.39	ng/L		10/08/18 09:18	10/13/18 06:44	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.5	U	17.5	0.61	ng/L		10/08/18 09:18	10/13/18 06:44	1
6:2 FTS	17.5	U	17.5	0.88	ng/L		10/08/18 09:18	10/13/18 06:44	1
8:2 FTS	17.5	U	17.5	0.49	ng/L		10/08/18 09:18	10/13/18 06:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*20*	*	*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C5-PFPeA DNU	*29*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C2 PFHxA	*40*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C4 PFHpA	*70*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C4 PFOA	*94*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C5 PFNA	*107*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C2 PFDA	*114*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C2 PFUnA	*115*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C2 PFDoA	*105*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C2 PFTeDA	*70*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C3 PFBS	*56*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
18O2 PFHxS	*68*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C4 PFOS	*73*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
13C8 FOSA	*49*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
d3-NMeFOSAA	*107*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
d5-NEtFOSAA	*131*		*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
M2-6:2 FTS	*191*	*	*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*
M2-8:2 FTS	*200*	*	*25 - 150*	*10/08/18 09:18*	*10/13/18 06:44*	*1*

Client Sample ID: FB-092818

Date Collected: 09/28/18 12:40
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.016	ug/L		10/03/18 16:49	10/04/18 00:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*42*		*10 - 150*	*10/03/18 16:49*	*10/04/18 00:00*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~0.57~~ 1.760	~~J B~~	1.76	0.36	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluoropentanoic acid (PFPeA)	1.76	U	1.76	0.66	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorohexanoic acid (PFHxA)	1.76	U	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluoroheptanoic acid (PFHpA)	1.76	U	1.76	0.28	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorooctanoic acid (PFOA)	1.76	U	1.76	0.28	ng/L		10/08/18 09:18	10/13/18 07:00	1

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Client: GEI Consultants, Inc.
Project/Site: Rockaway - PFAS - 1803556-1.6

TestAmerica Job ID: 460-165833-1

Client Sample ID: FB-092818
Date Collected: 09/28/18 12:40
Date Received: 10/01/18 18:40

Lab Sample ID: 460-165833-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	1.76	U	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorodecanoic acid (PFDA)	1.76	U	1.76	0.33	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluoroundecanoic acid (PFUnA)	1.76	U	1.76	0.22	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorobutanesulfonic acid (PFBS)	1.76	U	1.76	0.39	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorohexanesulfonic acid (PFHxS)	1.76	U	1.76	0.23	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.76	U	1.76	0.72	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorooctanesulfonic acid (PFOS)	1.76	U	1.76	0.67	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/08/18 09:18	10/13/18 07:00	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/08/18 09:18	10/13/18 07:00	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.6	U	17.6	0.40	ng/L		10/08/18 09:18	10/13/18 07:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/08/18 09:18	10/13/18 07:00	1
6:2 FTS	17.6	U	17.6	0.88	ng/L		10/08/18 09:18	10/13/18 07:00	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/08/18 09:18	10/13/18 07:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*80*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C5-PFPeA DNU	*92*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C2 PFHxA	*96*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C4 PFHpA	*94*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C4 PFOA	*101*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C5 PFNA	*98*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C2 PFDA	*102*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C2 PFUnA	*109*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C2 PFDoA	*95*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C2 PFTeDA	*65*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C3 PFBS	*71*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
18O2 PFHxS	*80*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C4 PFOS	*77*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
13C8 FOSA	*49*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
d3-NMeFOSAA	*74*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
M2-6:2 FTS	*105*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*
M2-8:2 FTS	*109*		*25 - 150*	*10/08/18 09:18*	*10/13/18 07:00*	*1*

DRAFT

Melissa Felter (716)665-4317 melissa.haas@testamericainc.com

Page 1 of

Company: GEI Consultants, Inc.

Address: 455 Winding Brook Drive Suite 201

City: Glastonbury

State, Zip: CT, 06033

Phone: 860-368-5300(Tel) 860-808-9717(Fax)

Email: mfelter@geiconsultants.com

Project Name: Emerging Contaminants - Long Island/NYC

Site/Project Description: Roukaway - PFAS-18035.56-1.6

Due Date Requested:

TAT Requested (days): 10 days

PO #: 18035.56-1.6

WO #:

Project #: 46027288

SSOW#:

Job #:

Analysis Requested

Preservatic
A - HCL
B - NaOH
C - Zn Aceta
D - Nitric Aci
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic
I - Ice
J - DI Water
K - EDTA
L - EDA
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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Spec
				Preservation Code:			N	N		
MW-02S	9-28-18	1025	G	Water			X	X	1	MS/
RW-05M	9-28-18	1120	G	Water			X	X	2	
MW-26S	9-28-18	1235	G	Water			X	X	3	
MW-XX-092818	9-28-18	—	G	Water			X	X	4	
FB-092818	9-28-18	1240	G	Water			X	X	5	
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						

SUB Work

460-165833 Chain of

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

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Sample Disposal (A fee may be assessed if samples are retained longer t
☐ Return To Client ☐ Disposal By Lab ☐ Archive For

Special Instructions/QC Requirements: **Edison lab -log in both tests into one**

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

	Date/Time	Company		Date/Time
Relinquished by:	10/1/18 12:08	GEI	Received by:	10/1/18 12:
Relinquished by:	10/1/18 18:40		Received by:	10/1/18 18
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:

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

Cooler Temperature(s) °C and Other Remarks:

3.1/ 3.1 3.4/ 3.4 3.5/3.5 FR

Site: Long Island Emerging Contaminants, Sag Harbor
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-165735
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 1, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
SHMW-01IR	460-165735-01	PFAS, 1,4-Dioxane
SHMW-13I	460-165735-02	PFAS, 1,4-Dioxane
SHMW-03I	460-165735-03	PFAS, 1,4-Dioxane
MW-XX-092718	460-165735-04	PFAS, 1,4-Dioxane
FB-092718	460-165735-05	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-092718
Field Duplicate pair: SHMW-13I/MW-XX-092718

The above-listed aqueous samples and field blank sample were collected on September 27, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were detected in the associated laboratory method blank sample. Contaminants were detected in the associated field blank sample after application of laboratory blank contamination actions. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
Perfluorobutanoic acid (PFBA)	Method MB 200-134946: All samples	1.22 ng/L	12.2 ng/L	Qualify the result for PFBA in sample FB-092718 as nondetect (U) at the RL. Qualify the results for PFBA in samples SHMW-01IR, SHMW-13I, SHMW-03I, and MW-XX-092718 as estimated (J); High bias.
Perfluorooctanoic acid (PFOA)		0.392 ng/L	3.92 ng/L	Validation actions were not required.
Perfluorohexanesulfonic acid (PFHxS)		0.356 ng/L	3.56 ng/L	Qualify the result for PFHxS in sample FB-092718 as nondetect (U) at the RL.
Perfluoroundecanoic acid (PFUnA)	FB-092718: All samples	0.29 ng/L	2.90 ng/L	Qualify the result for PFUnA in samples SHMW-01IR and SHMW-13I as nondetect (U) at the RL.
Perfluorobutanesulfonic acid (PFBS)		0.41 ng/L	4.1 ng/L	Qualify the results for PFBS in samples SHMW-01IR and SHMW-03I as nondetect (U) at the RL. Qualify the results for PFBS in sample MW-XX-092718 as estimated (J); High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

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Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
SHMW-03I	M2-6:2 FTS	170	25-150	Validation action was not required as the result for 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.

MS/MSD Results

MS/MSD analyses were performed on sample SHMW-01IR for 1,4-dioxane and PFAS. Recovery and precision criteria were met.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples SHMW-13I and MW-XX-092718 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	SHMW-13I (ug/L)	MW-XX-092718 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	6.37	5.92	0.6
Perfluoropentanoic acid (PFPeA)	6.44	5.99	7.2
Perfluorohexanoic acid (PFHxA)	5.03	4.53	10.5
Perfluoroheptanoic acid (PFHpA)	3.23	3.81	16.5
Perfluorooctanoic acid (PFOA)	10.3	10.8	4.7
Perfluorodecanoic acid (PFDA)	0.40 J	1.77 U	NC, Within the RL
Perfluorobutanesulfonic acid (PFBS)	4.28	2.85	40.1, Within the RL
Perfluorohexanesulfonic acid(PFHxS)	4.76	4.08	15.4
Perfluoroheptanesulfonic Acid (PFHpS)	0.80 J	0.76 J	5.1
Perfluorooctanesulfonic acid (PFOS)	9.90	9.61	3.0
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

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Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

nt: GEI Consultants, Inc.
Project/Site: Sag Harbor - PFAS - 1803556-1.4

Client Sample ID: SHMW-01IR
Date Collected: 09/27/18 12:30
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 11:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	39		10 - 150	10/01/18 11:31	10/02/18 11:46	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**6.01**	~~B~~ J	1.67	0.34	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluoropentanoic acid (PFPeA)	**2.70**		1.67	0.63	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorohexanoic acid (PFHxA)	**2.20**		1.67	0.20	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluoroheptanoic acid (PFHpA)	**2.60**		1.67	0.27	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorooctanoic acid (PFOA)	**10.3**	B	1.67	0.27	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorononanoic acid (PFNA)	**4.29**		1.67	0.32	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorodecanoic acid (PFDA)	1.67	U	1.67	0.32	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluoroundecanoic acid (PFUnA)	~~0.36~~ J	1.67U	1.67	0.21	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorododecanoic acid (PFDoA)	1.67	U	1.67	0.29	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorotridecanoic acid (PFTriA)	1.67	U	1.67	0.20	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorotetradecanoic acid (PFTeA)	1.67	U	1.67	0.38	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorobutanesulfonic acid (PFBS)	~~1.16~~ J	1.67U	1.67	0.37	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorohexanesulfonic acid (PFHxS)	**4.79**	B	1.67	0.22	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.75**	J	1.67	0.69	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorooctanesulfonic acid (PFOS)	**10.7**		1.67	0.64	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorodecanesulfonic acid (PFDS)	1.67	U	1.67	0.44	ng/L		10/08/18 09:18	10/13/18 03:17	1
Perfluorooctanesulfonamide (FOSA)	1.67	U	1.67	0.47	ng/L		10/08/18 09:18	10/13/18 03:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	16.7	U	16.7	0.38	ng/L		10/08/18 09:18	10/13/18 03:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	16.7	U	16.7	0.59	ng/L		10/08/18 09:18	10/13/18 03:17	1
6:2 FTS	16.7	U	16.7	0.84	ng/L		10/08/18 09:18	10/13/18 03:17	1
8:2 FTS	16.7	U	16.7	0.47	ng/L		10/08/18 09:18	10/13/18 03:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	44		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C5-PFPeA DNU	63		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C2 PFHxA	71		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C4 PFHpA	84		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C4 PFOA	92		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C5 PFNA	96		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C2 PFDA	93		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C2 PFUnA	97		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C2 PFDoA	94		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C2 PFTeDA	68		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C3 PFBS	72		25 - 150	10/08/18 09:18	10/13/18 03:17	1
18O2 PFHxS	80		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C4 PFOS	79		25 - 150	10/08/18 09:18	10/13/18 03:17	1
13C8 FOSA	51		25 - 150	10/08/18 09:18	10/13/18 03:17	1
d3-NMeFOSAA	70		25 - 150	10/08/18 09:18	10/13/18 03:17	1
d5-NEtFOSAA	90		25 - 150	10/08/18 09:18	10/13/18 03:17	1

DRAFT

Client Sample ID: SHMW-01IR
Date Collected: 09/27/18 12:30
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	130		25 - 150	10/08/18 09:18	10/13/18 03:17	1
M2-8:2 FTS	118		25 - 150	10/08/18 09:18	10/13/18 03:17	1

Client Sample ID: SHMW-13I
Date Collected: 09/27/18 13:35
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 12:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	34		10 - 150	10/01/18 11:31	10/02/18 12:03	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**6.37**	**B J**	1.74	0.36	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluoropentanoic acid (PFPeA)	**6.44**		1.74	0.65	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorohexanoic acid (PFHxA)	**5.03**		1.74	0.21	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluoroheptanoic acid (PFHpA)	**3.23**		1.74	0.28	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorooctanoic acid (PFOA)	**10.3**	**B**	1.74	0.28	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorononanoic acid (PFNA)	1.74	U	1.74	0.33	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorodecanoic acid (PFDA)	**0.40**	**J**	1.74	0.33	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluoroundecanoic acid (PFUnA)	~~0.25~~	~~J~~ 1.740	1.74	0.22	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorododecanoic acid (PFDoA)	1.74	U	1.74	0.31	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorotridecanoic acid (PFTriA)	1.74	U	1.74	0.21	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorotetradecanoic acid (PFTeA)	1.74	U	1.74	0.39	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorobutanesulfonic acid (PFBS)	**4.28**		1.74	0.38	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorohexanesulfonic acid (PFHxS)	**4.76**	**B**	1.74	0.23	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.80**	**J**	1.74	0.72	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorooctanesulfonic acid (PFOS)	**9.90**		1.74	0.66	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorodecanesulfonic acid (PFDS)	1.74	U	1.74	0.46	ng/L		10/08/18 09:18	10/13/18 04:05	1
Perfluorooctanesulfonamide (FOSA)	1.74	U	1.74	0.49	ng/L		10/08/18 09:18	10/13/18 04:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.4	U	17.4	0.39	ng/L		10/08/18 09:18	10/13/18 04:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.4	U	17.4	0.61	ng/L		10/08/18 09:18	10/13/18 04:05	1
6:2 FTS	17.4	U	17.4	0.87	ng/L		10/08/18 09:18	10/13/18 04:05	1
8:2 FTS	17.4	U	17.4	0.49	ng/L		10/08/18 09:18	10/13/18 04:05	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	35		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C5-PFPeA DNU	47		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C2 PFHxA	59		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C4 PFHpA	80		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C4 PFOA	88		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C5 PFNA	87		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C2 PFDA	85		25 - 150	10/08/18 09:18	10/13/18 04:05	1

DRAFT

Client Sample ID: SHMW-13I
Date Collected: 09/27/18 13:35
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	90		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C2 PFDoA	83		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C2 PFTeDA	62		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C3 PFBS	67		25 - 150	10/08/18 09:18	10/13/18 04:05	1
18O2 PFHxS	77		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C4 PFOS	72		25 - 150	10/08/18 09:18	10/13/18 04:05	1
13C8 FOSA	52		25 - 150	10/08/18 09:18	10/13/18 04:05	1
d3-NMeFOSAA	69		25 - 150	10/08/18 09:18	10/13/18 04:05	1
d5-NEtFOSAA	83		25 - 150	10/08/18 09:18	10/13/18 04:05	1
M2-6:2 FTS	113		25 - 150	10/08/18 09:18	10/13/18 04:05	1
M2-8:2 FTS	119		25 - 150	10/08/18 09:18	10/13/18 04:05	1

Client Sample ID: SHMW-03I
Date Collected: 09/27/18 14:45
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 12:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	34		10 - 150	10/01/18 11:31	10/02/18 12:21	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.58**	B J.	1.71	0.35	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluoropentanoic acid (PFPeA)	**2.44**		1.71	0.64	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorohexanoic acid (PFHxA)	**2.03**		1.71	0.21	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluoroheptanoic acid (PFHpA)	**1.81**		1.71	0.27	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorooctanoic acid (PFOA)	**7.41**	B	1.71	0.27	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorononanoic acid (PFNA)	1.71	U	1.71	0.33	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorodecanoic acid (PFDA)	1.71	U	1.71	0.33	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluoroundecanoic acid (PFUnA)	1.71	U	1.71	0.21	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorododecanoic acid (PFDoA)	1.71	U	1.71	0.30	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorotridecanoic acid (PFTriA)	1.71	U	1.71	0.21	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorotetradecanoic acid (PFTeA)	1.71	U	1.71	0.39	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorobutanesulfonic acid (PFBS)	~~1.52~~ J	1.71U.	1.71	0.38	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorohexanesulfonic acid (PFHxS)	**4.69**	B	1.71	0.22	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.71	U	1.71	0.70	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorooctanesulfonic acid (PFOS)	**8.99**		1.71	0.65	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorodecanesulfonic acid (PFDS)	1.71	U	1.71	0.45	ng/L		10/08/18 09:18	10/13/18 04:21	1
Perfluorooctanesulfonamide (FOSA)	1.71	U	1.71	0.48	ng/L		10/08/18 09:18	10/13/18 04:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.1	U	17.1	0.39	ng/L		10/08/18 09:18	10/13/18 04:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.1	U	17.1	0.60	ng/L		10/08/18 09:18	10/13/18 04:21	1
6:2 FTS	17.1	U	17.1	0.86	ng/L		10/08/18 09:18	10/13/18 04:21	1
8:2 FTS	17.1	U	17.1	0.48	ng/L		10/08/18 09:18	10/13/18 04:21	1

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Client Sample ID: SHMW-03I

Date Collected: 09/27/18 14:45
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	50		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C5-PFPeA DNU	64		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C2 PFHxA	67		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C4 PFHpA	80		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C4 PFOA	90		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C5 PFNA	89		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C2 PFDA	91		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C2 PFUnA	96		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C2 PFDoA	86		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C2 PFTeDA	92		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C3 PFBS	86		25 - 150	10/08/18 09:18	10/13/18 04:21	1
18O2 PFHxS	94		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C4 PFOS	96		25 - 150	10/08/18 09:18	10/13/18 04:21	1
13C8 FOSA	56		25 - 150	10/08/18 09:18	10/13/18 04:21	1
d3-NMeFOSAA	73		25 - 150	10/08/18 09:18	10/13/18 04:21	1
d5-NEtFOSAA	85		25 - 150	10/08/18 09:18	10/13/18 04:21	1
M2-6:2 FTS	170	*	25 - 150	10/08/18 09:18	10/13/18 04:21	1
M2-8:2 FTS	148		25 - 150	10/08/18 09:18	10/13/18 04:21	1

Client Sample ID: MW-XX-092718

Date Collected: 09/27/18 00:00
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 12:38	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	34		10 - 150	10/01/18 11:31	10/02/18 12:38	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**5.92**	**B J**	1.77	0.36	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluoropentanoic acid (PFPeA)	**5.99**		1.77	0.66	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorohexanoic acid (PFHxA)	**4.53**		1.77	0.21	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluoroheptanoic acid (PFHpA)	**3.81**		1.77	0.28	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorooctanoic acid (PFOA)	**10.8**	**B**	1.77	0.28	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorononanoic acid (PFNA)	1.77	U	1.77	0.34	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorodecanoic acid (PFDA)	1.77	U	1.77	0.34	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluoroundecanoic acid (PFUnA)	1.77	U	1.77	0.22	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorododecanoic acid (PFDoA)	1.77	U	1.77	0.31	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorotridecanoic acid (PFTriA)	1.77	U	1.77	0.21	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorotetradecanoic acid (PFTeA)	1.77	U	1.77	0.40	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorobutanesulfonic acid (PFBS)	**2.85**	**J**	1.77	0.39	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorohexanesulfonic acid (PFHxS)	**4.08**	**B**	1.77	0.23	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.76**	**J**	1.77	0.72	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorooctanesulfonic acid (PFOS)	**9.61**		1.77	0.67	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorodecanesulfonic acid (PFDS)	1.77	U	1.77	0.47	ng/L		10/08/18 09:18	10/13/18 04:37	1
Perfluorooctanesulfonamide (FOSA)	1.77	U	1.77	0.49	ng/L		10/08/18 09:18	10/13/18 04:37	1

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Client Sample ID: MW-XX-092718

Date Collected: 09/27/18 00:00
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.7	U	17.7	0.40	ng/L		10/08/18 09:18	10/13/18 04:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.7	U	17.7	0.62	ng/L		10/08/18 09:18	10/13/18 04:37	1
6:2 FTS	17.7	U	17.7	0.88	ng/L		10/08/18 09:18	10/13/18 04:37	1
8:2 FTS	17.7	U	17.7	0.49	ng/L		10/08/18 09:18	10/13/18 04:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	41		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C5-PFPeA DNU	56		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C2 PFHxA	63		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C4 PFHpA	82		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C4 PFOA	87		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C5 PFNA	86		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C2 PFDA	89		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C2 PFUnA	96		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C2 PFDoA	88		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C2 PFTeDA	96		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C3 PFBS	76		25 - 150	10/08/18 09:18	10/13/18 04:37	1
18O2 PFHxS	88		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C4 PFOS	79		25 - 150	10/08/18 09:18	10/13/18 04:37	1
13C8 FOSA	59		25 - 150	10/08/18 09:18	10/13/18 04:37	1
d3-NMeFOSAA	77		25 - 150	10/08/18 09:18	10/13/18 04:37	1
d5-NEtFOSAA	83		25 - 150	10/08/18 09:18	10/13/18 04:37	1
M2-6:2 FTS	124		25 - 150	10/08/18 09:18	10/13/18 04:37	1
M2-8:2 FTS	123		25 - 150	10/08/18 09:18	10/13/18 04:37	1

Client Sample ID: FB-092718

Date Collected: 09/27/18 14:30
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-5
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/01/18 11:31	10/02/18 12:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	39		10 - 150	10/01/18 11:31	10/02/18 12:55	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	~~0.38~~ ~~J B~~ 1.75 U		1.75	0.36	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluoropentanoic acid (PFPeA)	1.75	U	1.75	0.66	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorohexanoic acid (PFHxA)	1.75	U	1.75	0.21	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluoroheptanoic acid (PFHpA)	1.75	U	1.75	0.28	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorooctanoic acid (PFOA)	1.75	U	1.75	0.28	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorononanoic acid (PFNA)	1.75	U	1.75	0.33	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorodecanoic acid (PFDA)	1.75	U	1.75	0.33	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluoroundecanoic acid (PFUnA)	**0.29**	J	1.75	0.22	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorododecanoic acid (PFDoA)	1.75	U	1.75	0.31	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorotridecanoic acid (PFTriA)	1.75	U	1.75	0.21	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorotetradecanoic acid (PFTeA)	1.75	U	1.75	0.39	ng/L		10/08/18 09:18	10/13/18 04:52	1

DRAFT

Client Sample ID: FB-092718
Date Collected: 09/27/18 14:30
Date Received: 09/28/18 20:00

Lab Sample ID: 460-165735-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	0.41	J	1.75	0.39	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorohexanesulfonic acid (PFHxS)	~~0.25~~	~~J B~~ 1.75 U	1.75	0.23	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.75	U	1.75	0.72	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorooctanesulfonic acid (PFOS)	1.75	U	1.75	0.67	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorodecanesulfonic acid (PFDS)	1.75	U	1.75	0.46	ng/L		10/08/18 09:18	10/13/18 04:52	1
Perfluorooctanesulfonamide (FOSA)	1.75	U	1.75	0.49	ng/L		10/08/18 09:18	10/13/18 04:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.5	U	17.5	0.39	ng/L		10/08/18 09:18	10/13/18 04:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.5	U	17.5	0.61	ng/L		10/08/18 09:18	10/13/18 04:52	1
6:2 FTS	17.5	U	17.5	0.88	ng/L		10/08/18 09:18	10/13/18 04:52	1
8:2 FTS	17.5	U	17.5	0.49	ng/L		10/08/18 09:18	10/13/18 04:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	71		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C5-PFPeA DNU	80		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C2 PFHxA	85		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C4 PFHpA	91		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C4 PFOA	101		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C5 PFNA	97		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C2 PFDA	97		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C2 PFUnA	97		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C2 PFDoA	89		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C2 PFTeDA	63		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C3 PFBS	74		25 - 150	10/08/18 09:18	10/13/18 04:52	1
18O2 PFHxS	78		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C4 PFOS	64		25 - 150	10/08/18 09:18	10/13/18 04:52	1
13C8 FOSA	46		25 - 150	10/08/18 09:18	10/13/18 04:52	1
d3-NMeFOSAA	67		25 - 150	10/08/18 09:18	10/13/18 04:52	1
d5-NEtFOSAA	90		25 - 150	10/08/18 09:18	10/13/18 04:52	1
M2-6:2 FTS	99		25 - 150	10/08/18 09:18	10/13/18 04:52	1
M2-8:2 FTS	110		25 - 150	10/08/18 09:18	10/13/18 04:52	1

DRAFT

Company: GEI Consultants, Inc.

Address: 455 Winding Brook Drive Suite 201

City: Glastonbury

State, Zip: CT, 06033

Phone: 860-368-5300(Tel) 860-608-9717(Fax)

Email: mfelter@geiconsultants.com

Project Name: Emerging Contaminants - Long Island/NYC

Site/Project Description: Sag Harbor-PFAS-1803556-1.4

Due Date Requested:

TAT Requested (days): 10 days

PO #: 1803556-1.4

WO #:

Project #: 46027288

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)	PFC_10A - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers
Preservation Code:						N	N	
SHMW-01IR	9-27-18	1230	G	Water		X	X	2
SHMW-13I	9-27-18	1335	G	Water		X	X	4
SHMW-03I	9-27-18	1445	G	Water		X	X	4
MW-XX-092718	9-27-18	—	G	Water		X	X	4
FB-092718	9-27-18	1430	G	Water		X	X	4
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				

460-165735

Possible Hazard Identification

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

Sample Disposal (A fee may be assessed if samples are retained long

☐ Return To Client ☐ Disposal By Lab ☐ Archive For

Deliverable Requested: I, II, III, IV, Other (specify) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into

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

Relinquished by	Date/Time	Company	Received by	Date/Time
	9/28/18 1045	GEI		9/28/18 1C
	9/28/18 20:00			09/29/18 2

Custody Seals Intact: ☐ Yes ☐ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

2.8/2.8 3.0/2.3 IR-9

DRAFT

Site: Long Island Emerging Contaminants, Skillman
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166276
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 6, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
SSMW-03	460-166276-01	PFAS, 1,4-Dioxane
SSMW-05	460-166276-02	PFAS, 1,4-Dioxane
DUP-100318-2	460-166276-03	PFAS, 1,4-Dioxane
FB-100318-2	460-166276-04	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100318-2
Field Duplicate pair: SSMW-03/DUP-100318-2

The above-listed aqueous samples and field blank sample were collected on October 3, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were not detected in the associated laboratory method blank samples. 1,4-Dioxane was detected in the associated field blank sample. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane	FB-100318-2: All samples	0.10 ug/L	1.0 ug/L	Qualify the result for 1,4-Dioxane in sample SSMW-05 as estimated (J); High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
SSMW-03	M2-6:2 FTS	495	25-150	Estimate (J) the positive result for 6:2 FTS in sample SSMW-03.
	M2-8:2 FTS	249		Validation action was not required as 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
SSMW-05	M2-6:2 FTS	522	25-150	Estimate (J) the positive results for 6:2 FTS, Perfluorooctanesulfonic acid (PFOS), and
	13C4 PFOS	168		

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Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
	13C2 PFUnA	161		Perfluoroundecanoic acid (PFUnA) in sample SSMW-05.
	M2-8:2 FTS	304		Validation action was not required as 8:2 FTS, Perfluorododecanoic acid, and Perfluorotetradecanoic acid were not detected in this sample and therefore not affected by the high recovery.
	13C2 PFDoA	167		
	13C2 PFTeDA	162		
DUP-100318-2	PFBA	23	25-150	Estimate (J) the positive results for Perfluorobutanoic acid and 6:2 FTS in sample DUP-100318-2.
	M2-6:2 FTS	429		
	M2-8:2 FTS	181		Validation action was not required as 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
FB-100318-2	M2-6:2 FTS	251	25-150	Validation action was not required as 6:2 FTS was not detected in this sample and therefore not affected by the high recoveries.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample SSMW-03 for 1,4-dioxane and PFAS. Recovery and precision criteria were met in the 1,4-dioxane analysis. The recoveries for Perfluoropentanoic acid (35%, 29%) were below the control limits of 40-160 in the MS/MSD. The positive result for Perfluoropentanoic acid (PFPeA) in sample SSMW-03 was qualified as estimated (J) and may be biased low.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples SSMW-03 and DUP-100318-2 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

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Analyte	SSMW-03 (ug/L)	DUP-100318-2 (ug/L)	RPD (%)
Perfluorobutanoic acid (PFBA)	48.5	55.9	14.2
Perfluoropentanoic (PFPeA)	69.3	61.4	12.1
Perfluorohexanoic acid (PFHxA)	73.3	73.9	0.8
Perfluoroheptanoic acid (PFHpA)	44.6	43.4	2.7
Perfluorooctanoic acid (PFOA)	106	92.1	14.0
Perfluorononanoic acid (PFNA)	6.55	5.67	14.4
Perfluorodecanoic acid (PFDA)	0.70 J	0.83 J	17.0
Perfluoroundecanoic acid (PFUnA)	0.28 J	0.29 J	3.5
Perfluorobutanesulfonic acid (PFBS)	10.8	9.81	9.6
Perfluorohexanesulfonic acid(PFHxS)	3.91	3.34	15.7
Perfluoroheptanesulfonic Acid (PFHpS)	1.55 J	1.07 J	36.6, Within the RL
Perfluorooctanesulfonic acid (PFOS)	42.4	40.8	3.8
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.45 J	17.4 U	NC, Within the RL
6:2 FTS	3.41 J	1.63 J	70.6, Within the RL
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Dilutions were not required.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample ID: SSMW-03
Date Collected: 10/03/18 11:50
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 09:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*42*		*10 - 150*	*10/08/18 18:48*	*10/09/18 09:24*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**48.5**		1.76	0.36	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluoropentanoic acid (PFPeA)	**69.3**	J	1.76	0.66	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorohexanoic acid (PFHxA)	**73.3**		1.76	0.21	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluoroheptanoic acid (PFHpA)	**44.6**		1.76	0.28	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorooctanoic acid (PFOA)	**106**		1.76	0.28	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorononanoic acid (PFNA)	**6.55**		1.76	0.34	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorodecanoic acid (PFDA)	**0.70**	J	1.76	0.34	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluoroundecanoic acid (PFUnA)	**0.28**	J	1.76	0.22	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorododecanoic acid (PFDoA)	1.76	U	1.76	0.31	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorotridecanoic acid (PFTriA)	1.76	U	1.76	0.21	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorotetradecanoic acid (PFTeA)	1.76	U	1.76	0.40	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorobutanesulfonic acid (PFBS)	**10.8**		1.76	0.39	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorohexanesulfonic acid (PFHxS)	**3.91**		1.76	0.23	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.55**	J	1.76	0.72	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorooctanesulfonic acid (PFOS)	**42.4**		1.76	0.67	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorodecanesulfonic acid (PFDS)	1.76	U	1.76	0.47	ng/L		10/11/18 09:45	10/16/18 06:14	1
Perfluorooctanesulfonamide (FOSA)	1.76	U	1.76	0.49	ng/L		10/11/18 09:45	10/16/18 06:14	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**0.45**	J	17.6	0.40	ng/L		10/11/18 09:45	10/16/18 06:14	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.6	U	17.6	0.62	ng/L		10/11/18 09:45	10/16/18 06:14	1
6:2 FTS	**3.41**	J	17.6	0.88	ng/L		10/11/18 09:45	10/16/18 06:14	1
8:2 FTS	17.6	U	17.6	0.49	ng/L		10/11/18 09:45	10/16/18 06:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*26*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C5-PFPeA DNU	*55*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C2 PFHxA	*65*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C4 PFHpA	*77*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C4 PFOA	*108*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C5 PFNA	*132*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C2 PFDA	*137*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C2 PFUnA	*140*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C2 PFDoA	*144*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C2 PFTeDA	*137*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C3 PFBS	*74*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
18O2 PFHxS	*107*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C4 PFOS	*138*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
13C8 FOSA	*95*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
d3-NMeFOSAA	*108*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*
d5-NEtFOSAA	*125*		*25 - 150*	*10/11/18 09:45*	*10/16/18 06:14*	*1*

DRAFT

Client Sample ID: SSMW-03

Date Collected: 10/03/18 11:50
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	495	*	25 - 150	10/11/18 09:45	10/16/18 06:14	1
M2-8:2 FTS	249	*	25 - 150	10/11/18 09:45	10/16/18 06:14	1

Client Sample ID: SSMW-05

Date Collected: 10/03/18 13:25
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.42	J	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 09:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	47		10 - 150	10/08/18 18:48	10/09/18 09:42	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	83.8		1.78	0.36	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluoropentanoic acid (PFPeA)	164		1.78	0.67	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorohexanoic acid (PFHxA)	208		1.78	0.21	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluoroheptanoic acid (PFHpA)	91.0		1.78	0.28	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorooctanoic acid (PFOA)	180		1.78	0.28	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorononanoic acid (PFNA)	8.05		1.78	0.34	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorodecanoic acid (PFDA)	5.36		1.78	0.34	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluoroundecanoic acid (PFUnA)	0.36	J	1.78	0.22	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorododecanoic acid (PFDoA)	1.78	U	1.78	0.31	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorotridecanoic acid (PFTriA)	1.78	U	1.78	0.21	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorotetradecanoic acid (PFTeA)	1.78	U	1.78	0.40	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorobutanesulfonic acid (PFBS)	14.7		1.78	0.39	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorohexanesulfonic acid (PFHxS)	9.72		1.78	0.23	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.05	J	1.78	0.73	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorooctanesulfonic acid (PFOS)	44.7	J	1.78	0.68	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorodecanesulfonic acid (PFDS)	1.78	U	1.78	0.47	ng/L		10/11/18 09:45	10/16/18 07:01	1
Perfluorooctanesulfonamide (FOSA)	1.02	J	1.78	0.50	ng/L		10/11/18 09:45	10/16/18 07:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.8	U	17.8	0.40	ng/L		10/11/18 09:45	10/16/18 07:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.8	U	17.8	0.62	ng/L		10/11/18 09:45	10/16/18 07:01	1
6:2 FTS	5.02	J	17.8	0.89	ng/L		10/11/18 09:45	10/16/18 07:01	1
8:2 FTS	17.8	U	17.8	0.50	ng/L		10/11/18 09:45	10/16/18 07:01	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	28		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C5-PFPeA DNU	56		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C2 PFHxA	62		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C4 PFHpA	79		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C4 PFOA	108		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C5 PFNA	135		25 - 150	10/11/18 09:45	10/16/18 07:01	1

DRAFT

Client Sample ID: SSMW-05
Date Collected: 10/03/18 13:25
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	142		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C2 PFUnA	161	*	25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C2 PFDoA	167	*	25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C2 PFTeDA	162	*	25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C3 PFBS	94		25 - 150	10/11/18 09:45	10/16/18 07:01	1
18O2 PFHxS	118		25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C4 PFOS	168	*	25 - 150	10/11/18 09:45	10/16/18 07:01	1
13C8 FOSA	114		25 - 150	10/11/18 09:45	10/16/18 07:01	1
d3-NMeFOSAA	109		25 - 150	10/11/18 09:45	10/16/18 07:01	1
d5-NEtFOSAA	131		25 - 150	10/11/18 09:45	10/16/18 07:01	1
M2-6:2 FTS	522	*	25 - 150	10/11/18 09:45	10/16/18 07:01	1
M2-8:2 FTS	304	*	25 - 150	10/11/18 09:45	10/16/18 07:01	1

Client Sample ID: DUP-100318-2
Date Collected: 10/03/18 00:00
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 09:59	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	47		10 - 150	10/08/18 18:48	10/09/18 09:59	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**55.9**	J *	1.74	0.36	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluoropentanoic acid (PFPeA)	**61.4**		1.74	0.65	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorohexanoic acid (PFHxA)	**73.9**		1.74	0.21	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluoroheptanoic acid (PFHpA)	**43.4**		1.74	0.28	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorooctanoic acid (PFOA)	**92.1**		1.74	0.28	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorononanoic acid (PFNA)	**5.67**		1.74	0.33	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorodecanoic acid (PFDA)	**0.83**	J *	1.74	0.33	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluoroundecanoic acid (PFUnA)	**0.29**	J *	1.74	0.22	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorododecanoic acid (PFDoA)	1.74	U	1.74	0.30	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorotridecanoic acid (PFTriA)	1.74	U	1.74	0.21	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorotetradecanoic acid (PFTeA)	1.74	U	1.74	0.39	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorobutanesulfonic acid (PFBS)	**9.81**		1.74	0.38	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorohexanesulfonic acid (PFHxS)	**3.34**		1.74	0.23	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.07**	J *	1.74	0.71	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorooctanesulfonic acid (PFOS)	**40.8**		1.74	0.66	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorodecanesulfonic acid (PFDS)	1.74	U	1.74	0.46	ng/L		10/11/18 09:45	10/16/18 07:17	1
Perfluorooctanesulfonamide (FOSA)	1.74	U	1.74	0.49	ng/L		10/11/18 09:45	10/16/18 07:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.4	U	17.4	0.39	ng/L		10/11/18 09:45	10/16/18 07:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.4	U	17.4	0.61	ng/L		10/11/18 09:45	10/16/18 07:17	1

DRAFT

Client Sample ID: DUP-100318-2
Date Collected: 10/03/18 00:00
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
6:2 FTS	1.63	J *	17.4	0.87	ng/L		10/11/18 09:45	10/16/18 07:17	1
8:2 FTS	17.4	U	17.4	0.49	ng/L		10/11/18 09:45	10/16/18 07:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*23*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C5-PFPeA DNU	*57*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C2 PFHxA	*54*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C4 PFHpA	*68*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C4 PFOA	*99*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C5 PFNA	*111*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C2 PFDA	*107*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C2 PFUnA	*119*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C2 PFDoA	*128*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C2 PFTeDA	*118*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C3 PFBS	*68*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
18O2 PFHxS	*101*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C4 PFOS	*124*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
13C8 FOSA	*90*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
d3-NMeFOSAA	*90*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
d5-NEtFOSAA	*101*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
M2-6:2 FTS	*429*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*
M2-8:2 FTS	*181*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 07:17*	*1*

Client Sample ID: FB-100318-2
Date Collected: 10/03/18 11:10
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.10	J *	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 10:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*48*		*10 - 150*	*10/08/18 18:48*	*10/09/18 10:16*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.72	U	1.72	0.35	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluoropentanoic acid (PFPeA)	1.72	U	1.72	0.65	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorohexanoic acid (PFHxA)	1.72	U	1.72	0.21	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluoroheptanoic acid (PFHpA)	1.72	U	1.72	0.28	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorooctanoic acid (PFOA)	1.72	U	1.72	0.28	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorononanoic acid (PFNA)	1.72	U	1.72	0.33	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorodecanoic acid (PFDA)	1.72	U	1.72	0.33	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluoroundecanoic acid (PFUnA)	1.72	U	1.72	0.22	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorododecanoic acid (PFDoA)	1.72	U	1.72	0.30	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorotridecanoic acid (PFTriA)	1.72	U	1.72	0.21	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorotetradecanoic acid (PFTeA)	1.72	U	1.72	0.39	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorobutanesulfonic acid (PFBS)	1.72	U	1.72	0.38	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorohexanesulfonic acid (PFHxS)	1.72	U	1.72	0.22	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.72	U	1.72	0.71	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorooctanesulfonic acid (PFOS)	1.72	U	1.72	0.65	ng/L		10/11/18 09:45	10/16/18 07:33	1

DRAFT

Client: GEI Consultants, Inc.
Project/Site: Skillman-PFAS-1803556-1.12

TestAmerica Job ID: 460-166276-1

Client Sample ID: FB-100318-2
Date Collected: 10/03/18 11:10
Date Received: 10/04/18 19:30

Lab Sample ID: 460-166276-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	1.72	U	1.72	0.46	ng/L		10/11/18 09:45	10/16/18 07:33	1
Perfluorooctanesulfonamide (FOSA)	1.72	U	1.72	0.48	ng/L		10/11/18 09:45	10/16/18 07:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.2	U	17.2	0.39	ng/L		10/11/18 09:45	10/16/18 07:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.2	U	17.2	0.60	ng/L		10/11/18 09:45	10/16/18 07:33	1
6:2 FTS	17.2	U	17.2	0.86	ng/L		10/11/18 09:45	10/16/18 07:33	1
8:2 FTS	17.2	U	17.2	0.48	ng/L		10/11/18 09:45	10/16/18 07:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*81*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C5-PFPeA DNU	*138*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C2 PFHxA	*118*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C4 PFHpA	*96*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C4 PFOA	*106*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C5 PFNA	*107*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C2 PFDA	*106*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C2 PFUnA	*114*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C2 PFDoA	*116*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C2 PFTeDA	*111*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C3 PFBS	*117*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
18O2 PFHxS	*97*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C4 PFOS	*122*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
13C8 FOSA	*76*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
d3-NMeFOSAA	*84*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
d5-NEtFOSAA	*92*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
M2-6:2 FTS	*251*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*
M2-8:2 FTS	*110*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:33*	*1*

DRAFT

GEI Consultants, Inc.

Address: 455 Winding Brook Drive Suite 201	Due Date Requested:
City: Glastonbury	TAT Requested (days): 10 days
State, Zip: CT, 06033	
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.12
Email: mfelter@geiconsultants.com	WO #:
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288
Site/Project Description: Skillman-PFAS-1803556-1.12	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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers
			Preservation Code:				N	N	
SSMW-03	10/3/18	1150	G	Water	N				12
SSMW-05	10/3/18	1325	G	Water	N				4
DUP-100318-2	10/3/18	—	G	Water	N	N			4
FB-100318-2	10/3/18	1110	G	Water	N	N			4

Preser
A - HCL
B - NaC
C - Zn A
D - Nitric
E - NaH
F - MeO
G - Amc
H - Asc
I - Ice
J - DI W
K - EDT
L - EDA
Other:

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

Sample Disposal (A fee may be assessed if samples are retained longe
☐ Return To Client x Disposal By Lab ☐ Archive For

Deliverable Requested: I, II, III, IV, Other (specify) NY Cat B

Special Instructions/QC Requirements: Edison lab -log in both tests into

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: [redacted]	Company: [redacted]	Received by: [redacted]	Date/Time: [redacted]	
Relinquished by:	Date/Time: 10/4/18 1430	Company: GEI	Received by:	Date/Time: 10/4/18 1	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	

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

Cooler Temperature(s) °C and Other Remarks:

2.11 2.0 2.7/2.7 tRA9

DRAFT

Site: Long Island Emerging Contaminants, Wythe
Laboratory: Test America, Burlington, VT and Edison, NJ
Report No.: 460-166275
Reviewer: Lorie MacKinnon/GEI Consultants
Date: November 6, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
WA-MW-04	460-166275-01	PFAS, 1,4-Dioxane
WA-MW-01	460-166275-02	PFAS, 1,4-Dioxane
DUP-100318-1	460-166275-03	PFAS, 1,4-Dioxane
FB-100318-1	460-166275-04	PFAS, 1,4-Dioxane

Associated QC Samples:
Field Blank: FB-100318-1
Field Duplicate pair: WA-MW-04/DUP-100318-1

The above-listed aqueous samples and field blank sample were collected on October 3, 2018 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

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The validation findings were based on the following information.

Data Completeness

The data package was found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

All initial and continuing calibration criteria were met.

Blanks

Analytes were not detected in the associated laboratory method blank samples. 1,4-Dioxane was detected in the associated field blank sample. The following table summarizes the contamination and validation actions taken.

Analyte	Blank ID/ Associated Samples	Concentration Detected	10x Action Level	Validation Actions
1,4-Dioxane	FB-100318-1: All samples	0.11 ug/L	1.1 ug/L	Qualify the results for 1,4-dioxane in samples WA-MW-04 and DUP-100318-1 as estimated (J); High bias.

Blank Actions:
If the sample result is < RL; report the result as nondetect (U) at the reporting limit (RL).
If the sample result is ≥ RL and <blank contamination detected; report the result as nondetect (U) at the reported value.
If the sample result is ≥ RL and < 10x Action Level; professional judgment was taken to report the sample result as estimated (J); biased high.
If the sample result is nondetect or > 10x Action Level; validation action is not required.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
WA-MW-04	PFBA	22	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample WA-MW-04.
	M2-6:2 FTS	462		
	M2-8:2 FTS	201		Validation action was not required as 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
WA-MW-01	PFBA	16	25-150	Estimate (J) the positive results for Perfluorobutanoic acid

DRAFT

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
	M2-6:2 FTS	538		(PFBA), 6:2 FTS, and Perfluoroundecanoic acid in sample WA-MW-01.
	13C2 PFUnA	158		
	M2-8:2 FTS	336		Validation action was not required as 8:2 FTS, N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA), Perfluorodecanoic acid (PFDoA), and Perfluorotetradecanoic acid (PFTeA) were not detected in this sample and therefore not affected by the high recoveries.
	D5-NEtFOSAA	155		
	13C2 PFDoA	158		
	13C2 PFTeDA	169		
DUP-100318-1	PFBA	19	25-150	Estimate (J) the positive results for Perfluorobutanoic acid (PFBA) and 6:2 FTS in sample DUP-100318-1.
	M2-6:2 FTS	421		
	M2-8:2 FTS	185		Validation action was not required as 8:2 FTS was not detected in this sample and therefore not affected by the high recovery.
FB-100318-1	M2-6:2 FTS	237	25-150	Validation action was not required as 6:2 FTS was not detected in this sample and therefore not affected by the high recovery.

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample WA-MW-04 for 1,4-dioxane and PFAS. Recovery and precision criteria were met in the 1,4-dioxane analysis. The recovery for Perfluorobutanoic acid (334%) was above the control limits of 40-160 in the MSD. The positive result for Perfluorobutanoic acid (PFBA) in sample WA-MW-04 was qualified as estimated (J) and may be biased high.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples WA-MW-04 and DUP-100318-1 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

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Analyte	WA-MW-04 (ug/L)	DUP-100318-1 (ug/L)	RPD (%)
1,4-Dioxane	0.55	0.55	0
Perfluorobutanoic acid (PFBA)	46.8	56.9	19.5
Perfluoropentanoic (PFPeA)	21.8	19.1	13.2
Perfluorohexanoic acid (PFHxA)	17.2	19.0	9.9
Perfluoroheptanoic acid (PFHpA)	15.9	18.5	15.1
Perfluorooctanoic acid (PFOA)	65.9	69.8	5.7
Perfluorononanoic acid (PFNA)	1.24 J	1.61 J	26.0
Perfluoroundecanoic acid (PFUnA)	0.37 J	1.77 U	NC, Within the RL
Perfluorobutanesulfonic acid (PFBS)	7.15	8.50	17.3
Perfluorohexanesulfonic acid(PFHxS)	1.96	2.31	16.4
Perfluoroheptanesulfonic Acid (PFHpS)	1.80 U	0.78 J	NC, Within the RL
Perfluorooctanesulfonic acid (PFOS)	3.39	3.92	14.5
6:2 FTS	2.08 J	2.07 J	0.5
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

Dilutions were not required.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

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DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

DRAFT

Client Sample ID: WA-MW-04
Date Collected: 10/03/18 09:30
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.55	J	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 11:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*50*		*10 - 150*	*10/08/18 18:48*	*10/09/18 11:08*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**46.8**	J	1.80	0.37	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluoropentanoic acid (PFPeA)	**21.8**		1.80	0.68	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorohexanoic acid (PFHxA)	**17.2**		1.80	0.22	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluoroheptanoic acid (PFHpA)	**15.9**		1.80	0.29	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorooctanoic acid (PFOA)	**65.9**		1.80	0.29	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorononanoic acid (PFNA)	**1.24**	J	1.80	0.34	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorodecanoic acid (PFDA)	1.80	U	1.80	0.34	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluoroundecanoic acid (PFUnA)	**0.37**	J	1.80	0.23	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorododecanoic acid (PFDoA)	1.80	U	1.80	0.32	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorotridecanoic acid (PFTriA)	1.80	U	1.80	0.22	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorotetradecanoic acid (PFTeA)	1.80	U	1.80	0.41	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorobutanesulfonic acid (PFBS)	**7.15**		1.80	0.40	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorohexanesulfonic acid (PFHxS)	**1.96**		1.80	0.23	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.80	U	1.80	0.74	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorooctanesulfonic acid (PFOS)	**3.39**		1.80	0.68	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorodecanesulfonic acid (PFDS)	1.80	U	1.80	0.48	ng/L		10/11/18 09:45	10/16/18 07:49	1
Perfluorooctanesulfonamide (FOSA)	1.80	U	1.80	0.50	ng/L		10/11/18 09:45	10/16/18 07:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	18.0	U	18.0	0.41	ng/L		10/11/18 09:45	10/16/18 07:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	18.0	U	18.0	0.63	ng/L		10/11/18 09:45	10/16/18 07:49	1
6:2 FTS	**2.08**	J	18.0	0.90	ng/L		10/11/18 09:45	10/16/18 07:49	1
8:2 FTS	18.0	U	18.0	0.50	ng/L		10/11/18 09:45	10/16/18 07:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*22*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C5-PFPeA DNU	*51*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C2 PFHxA	*68*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C4 PFHpA	*75*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C4 PFOA	*98*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C5 PFNA	*126*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C2 PFDA	*122*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C2 PFUnA	*126*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C2 PFDoA	*144*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C2 PFTeDA	*130*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C3 PFBS	*80*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
18O2 PFHxS	*107*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C4 PFOS	*132*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
13C8 FOSA	*83*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
d3-NMeFOSAA	*98*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*
d5-NEtFOSAA	*113*		*25 - 150*	*10/11/18 09:45*	*10/16/18 07:49*	*1*

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Client Sample ID: WA-MW-04

Date Collected: 10/03/18 09:30
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	462	*	25 - 150	10/11/18 09:45	10/16/18 07:49	1
M2-8:2 FTS	201	*	25 - 150	10/11/18 09:45	10/16/18 07:49	1

Client Sample ID: WA-MW-01

Date Collected: 10/03/18 10:30
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21	U	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 11:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	46		10 - 150	10/08/18 18:48	10/09/18 11:26	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**177**	J -	1.77	0.36	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluoropentanoic acid (PFPeA)	**149**		1.77	0.66	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorohexanoic acid (PFHxA)	**272**		1.77	0.21	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluoroheptanoic acid (PFHpA)	**30.6**		1.77	0.28	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorooctanoic acid (PFOA)	**23.1**		1.77	0.28	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorononanoic acid (PFNA)	**2.68**		1.77	0.34	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorodecanoic acid (PFDA)	1.77	U	1.77	0.34	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluoroundecanoic acid (PFUnA)	**0.22**	J -	1.77	0.22	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorododecanoic acid (PFDoA)	1.77	U	1.77	0.31	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorotridecanoic acid (PFTriA)	1.77	U	1.77	0.21	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorotetradecanoic acid (PFTeA)	1.77	U	1.77	0.40	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorobutanesulfonic acid (PFBS)	**7.11**		1.77	0.39	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorohexanesulfonic acid (PFHxS)	**0.58**	J -	1.77	0.23	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.77	U	1.77	0.72	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorooctanesulfonic acid (PFOS)	**15.4**		1.77	0.67	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorodecanesulfonic acid (PFDS)	1.77	U	1.77	0.47	ng/L		10/11/18 09:45	10/16/18 08:36	1
Perfluorooctanesulfonamide (FOSA)	1.77	U	1.77	0.49	ng/L		10/11/18 09:45	10/16/18 08:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.7	U	17.7	0.40	ng/L		10/11/18 09:45	10/16/18 08:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.7	U	17.7	0.62	ng/L		10/11/18 09:45	10/16/18 08:36	1
6:2 FTS	**1.08**	J -	17.7	0.88	ng/L		10/11/18 09:45	10/16/18 08:36	1
8:2 FTS	17.7	U	17.7	0.49	ng/L		10/11/18 09:45	10/16/18 08:36	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	16	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C5-PFPeA DNU	38		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C2 PFHxA	45		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C4 PFHpA	62		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C4 PFOA	93		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C5 PFNA	124		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C2 PFDA	135		25 - 150	10/11/18 09:45	10/16/18 08:36	1

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Client Sample ID: WA-MW-01

Date Collected: 10/03/18 10:30
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	158	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C2 PFDoA	158	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C2 PFTeDA	169	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C3 PFBS	89		25 - 150	10/11/18 09:45	10/16/18 08:36	1
18O2 PFHxS	102		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C4 PFOS	126		25 - 150	10/11/18 09:45	10/16/18 08:36	1
13C8 FOSA	95		25 - 150	10/11/18 09:45	10/16/18 08:36	1
d3-NMeFOSAA	137		25 - 150	10/11/18 09:45	10/16/18 08:36	1
d5-NEtFOSAA	155	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1
M2-6:2 FTS	538	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1
M2-8:2 FTS	336	*	25 - 150	10/11/18 09:45	10/16/18 08:36	1

Client Sample ID: DUP-100318-1

Date Collected: 10/03/18 00:00
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.55	J	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 11:43	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	46		10 - 150	10/08/18 18:48	10/09/18 11:43	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**56.9**	J	1.77	0.36	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluoropentanoic acid (PFPeA)	**19.1**		1.77	0.66	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorohexanoic acid (PFHxA)	**19.0**		1.77	0.21	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluoroheptanoic acid (PFHpA)	**18.5**		1.77	0.28	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorooctanoic acid (PFOA)	**69.8**		1.77	0.28	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorononanoic acid (PFNA)	**1.61**	J	1.77	0.34	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorodecanoic acid (PFDA)	1.77	U	1.77	0.34	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluoroundecanoic acid (PFUnA)	1.77	U	1.77	0.22	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorododecanoic acid (PFDoA)	1.77	U	1.77	0.31	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorotridecanoic acid (PFTriA)	1.77	U	1.77	0.21	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorotetradecanoic acid (PFTeA)	1.77	U	1.77	0.40	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorobutanesulfonic acid (PFBS)	**8.50**		1.77	0.39	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorohexanesulfonic acid (PFHxS)	**2.31**		1.77	0.23	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.78**	J	1.77	0.72	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorooctanesulfonic acid (PFOS)	**3.92**		1.77	0.67	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorodecanesulfonic acid (PFDS)	1.77	U	1.77	0.47	ng/L		10/11/18 09:45	10/16/18 08:52	1
Perfluorooctanesulfonamide (FOSA)	1.77	U	1.77	0.49	ng/L		10/11/18 09:45	10/16/18 08:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.7	U	17.7	0.40	ng/L		10/11/18 09:45	10/16/18 08:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.7	U	17.7	0.62	ng/L		10/11/18 09:45	10/16/18 08:52	1
6:2 FTS	**2.07**	J	17.7	0.88	ng/L		10/11/18 09:45	10/16/18 08:52	1
8:2 FTS	17.7	U	17.7	0.49	ng/L		10/11/18 09:45	10/16/18 08:52	1

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Client Sample ID: DUP-100318-1

Date Collected: 10/03/18 00:00
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-3
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	19	*	25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C5-PFPeA DNU	54		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C2 PFHxA	59		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C4 PFHpA	67		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C4 PFOA	93		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C5 PFNA	118		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C2 PFDA	107		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C2 PFUnA	119		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C2 PFDoA	132		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C2 PFTeDA	116		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C3 PFBS	65		25 - 150	10/11/18 09:45	10/16/18 08:52	1
18O2 PFHxS	93		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C4 PFOS	121		25 - 150	10/11/18 09:45	10/16/18 08:52	1
13C8 FOSA	73		25 - 150	10/11/18 09:45	10/16/18 08:52	1
d3-NMeFOSAA	94		25 - 150	10/11/18 09:45	10/16/18 08:52	1
d5-NEtFOSAA	102		25 - 150	10/11/18 09:45	10/16/18 08:52	1
M2-6:2 FTS	421	*	25 - 150	10/11/18 09:45	10/16/18 08:52	1
M2-8:2 FTS	185	*	25 - 150	10/11/18 09:45	10/16/18 08:52	1

Client Sample ID: FB-100318-1

Date Collected: 10/03/18 08:50
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-4
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.11	J	0.21	0.017	ug/L		10/08/18 18:48	10/09/18 12:00	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	45		10 - 150	10/08/18 18:48	10/09/18 12:00	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.70	U	1.70	0.35	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluoropentanoic acid (PFPeA)	1.70	U	1.70	0.64	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorohexanoic acid (PFHxA)	1.70	U	1.70	0.20	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluoroheptanoic acid (PFHpA)	1.70	U	1.70	0.27	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorooctanoic acid (PFOA)	1.70	U	1.70	0.27	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorononanoic acid (PFNA)	1.70	U	1.70	0.32	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorodecanoic acid (PFDA)	1.70	U	1.70	0.32	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluoroundecanoic acid (PFUnA)	1.70	U	1.70	0.21	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorododecanoic acid (PFDoA)	1.70	U	1.70	0.30	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorotridecanoic acid (PFTriA)	1.70	U	1.70	0.20	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorotetradecanoic acid (PFTeA)	1.70	U	1.70	0.38	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorobutanesulfonic acid (PFBS)	1.70	U	1.70	0.37	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorohexanesulfonic acid (PFHxS)	1.70	U	1.70	0.22	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.70	U	1.70	0.70	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorooctanesulfonic acid (PFOS)	1.70	U	1.70	0.65	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorodecanesulfonic acid (PFDS)	1.70	U	1.70	0.45	ng/L		10/11/18 09:45	10/16/18 09:08	1
Perfluorooctanesulfonamide (FOSA)	1.70	U	1.70	0.48	ng/L		10/11/18 09:45	10/16/18 09:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	17.0	U	17.0	0.38	ng/L		10/11/18 09:45	10/16/18 09:08	1

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Client Sample ID: FB-100318-1
Date Collected: 10/03/18 08:50
Date Received: 10/04/18 19:20

Lab Sample ID: 460-166275-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	17.0	U	17.0	0.60	ng/L		10/11/18 09:45	10/16/18 09:08	1
6:2 FTS	17.0	U	17.0	0.85	ng/L		10/11/18 09:45	10/16/18 09:08	1
8:2 FTS	17.0	U	17.0	0.48	ng/L		10/11/18 09:45	10/16/18 09:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*78*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C5-PFPeA DNU	*130*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C2 PFHxA	*117*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C4 PFHpA	*90*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C4 PFOA	*101*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C2 PFDA	*96*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C2 PFUnA	*104*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C2 PFDoA	*105*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C2 PFTeDA	*101*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C3 PFBS	*107*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
18O2 PFHxS	*95*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C4 PFOS	*105*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
13C8 FOSA	*68*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
d3-NMeFOSAA	*85*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
d5-NEtFOSAA	*88*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
M2-6:2 FTS	*237*	*	*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*
M2-8:2 FTS	*104*		*25 - 150*	*10/11/18 09:45*	*10/16/18 09:08*	*1*

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TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Phone (732) 549-3900 Fax (732) 549-3679

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

10/18/2018

Client Information	Sampler: Craig Hayes	Lab PM: Haas, Melissa	Carrier Tracking No(s):	COC No:
Client Contact: Melissa Felter	Phone: 516-263-7391	E-Mail: melissa.haas@testamericainc.com		Page: Page 1 of 1
Company: GEI Consultants, Inc.				Job #: 460275
Address: 455 Winding Brook Drive Suite 201	Due Date Requested:			
City: Glastonbury	TAT Requested (days): 10 days			
State, Zip: CT, 06033				
Phone: 860-368-5300(Tel) 860-608-9717(Fax)	PO #: 1803556-1.13			
Email: mfelter@geiconsultants.com	WO #:			
Project Name: Emerging Contaminants - Long Island/NYC	Project #: 46027288			
Site/Project Description: Wythe-PFAS-1803556-1.13	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)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID (1,4-Dioxane)	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N				
WA-MW-04	10/3/18	0930	G	Water	N		X	X	12	MS/MSD 1
WA-MW-08	10/3/18	1030	G	Water	N		X	X	4	2
DUP-100318-1	10/3/18	—	G	Water	N	N	X	X	4	3
FB-100318-1	10/3/18	0850	G	Water	N	N	X	X	4	4

SUB Work

Preservation Codes:

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

Other:

Possible Hazard Identification
[x] 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 [x] Disposal By Lab [ ] Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify) **NY Cat B**

Special Instructions/QC Requirements: **Edison lab -log in both tests into one login and ship PFAS**

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

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	10/4/18 1830			10/4/18 1920	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

2.1 2.0 2.7/2.7 IR#9

Ver: 08/04/2016

460-166275 Chain of Custody

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